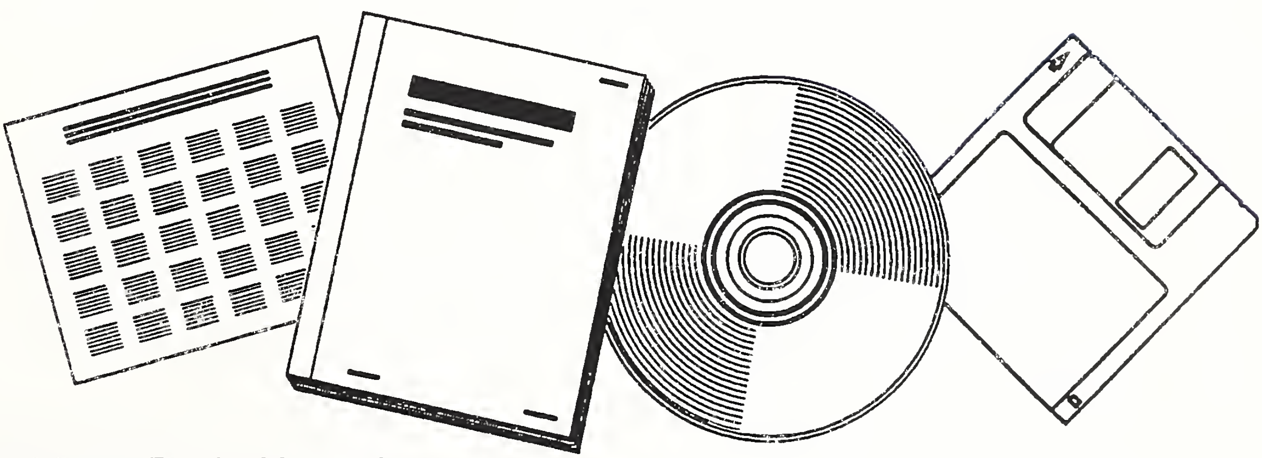
PB96155197

HERITAGE RESOURCES MANAGEMENT. ARCHEOLOGY OF THE ALBUQUERQUE SECTOR OF THE ELENA GALLEGOS PROJECT

(U.S.) FOREST SERVICE, ALBUQUERQUE, NM.
SOUTHWESTERN REGION

SEP 1995



U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

United States
Department of
Agriculture

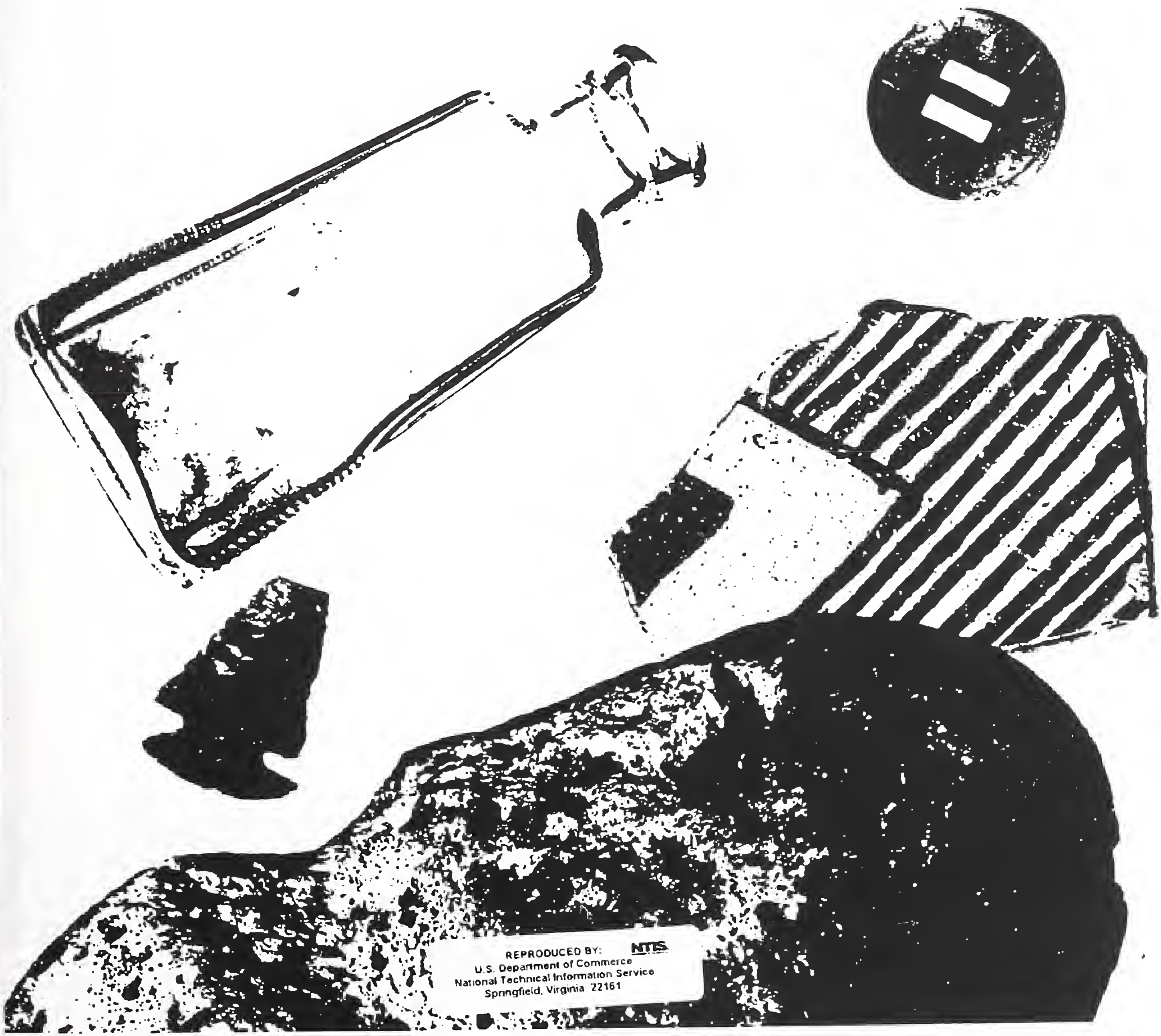
Forest
Service

Southwestern
Region

Report No. 14

Heritage Resources Management

Archeology of the Albuquerque Sector of the Elena Gallegos Project



Printed on recycled paper • 9/95

Archeology of the Albuquerque Sector of the Elena Gallegos Project

Edited by
Joseph A. Tainter

Contributors

Nancy J. Akins
Jack B. Bertram
Galen R. Burgett
David "A" Gillio
Charles Haecker
Louanna Haecker
Linda J. Scott
Joseph A. Tainter
Mollie S. Toll
A. H. Warren
Dan Warren

Heritage Resources Management
Report No. 14

USDA Forest Service
Southwestern Region

September 1995

Contents

Chapter 4 • Rio Puerco Valley Floral Remains *By Mollie S. Toll*

Chapter 5 • Food and Fuel Use At PL 30A and 32A *By Mollie S. Toll*

Chapter 6 • Pollen Analysis of Atrisco Sites *By Linda J. Scott*

Chapter 7 • Pollen Analysis At PL 30A and 32A *By Linda J. Scott*

Chapter 8 • Atrisco Sector Faunal Remains *By Jack B. Bertram*

Chapter 9 • Faunal Remains: PL 40A and 50A *By Jack B. Bertram*

Chapter 10 • Faunal Remains: PL 30A and 32A *By Nancy J. Akins*

Chapter 11 • Lithic Analysis: Albuquerque Area *By Jack B. Bertram*

Chapter 13: Historic Sites *By Louanna Haecker and Charles Haecker*

Chapter 14 • Synthesis and Evaluation *By Joseph A. Tainter*

Appendix

List of Tables

For a full list of Chapter 11 tables, please see Appendix 11-3, page 427. Also, see Editor's Note, page 208.

List of Figures

List of Maps

Chapter 1 • Introduction and Research Design

Joseph A. Tainter

Introduction

The Elena Gallegos Land Exchange began in 1981. Its purpose was to acquire the major portion of the eastern part of the Elena Gallegos Grant, then owned by the Albuquerque Academy, for inclusion in the Sandia Mountain Wilderness near Albuquerque, New Mexico. The need to obtain the Grant for public ownership had been discussed in Albuquerque for several years. Without public ownership the land would probably have been subdivided, leaving a medley of houses and roads projecting into the wilderness. Recognizing the problem, Congress authorized the Forest Service to acquire the Grant, but provided no funds for purchase.

An alternative way to acquire the Grant was to exchange it for Federal lands. Disposal of Federal lands requires compliance with the National Historic Preservation Act of 1966 and 36 CFR 800. When the land exchange was decided upon, the Elena Gallegos Cultural Resources Project was born.

The original intention was to trade Federal lands directly for the Grant. The lands to be traded were mainly under the jurisdiction of the Bureau of Land Management, and so it was that a Forest Service archeological project came to be done on BLM lands. When the BLM lands proved unacceptable to the Trustees of the Albuquerque Academy, a more circuitous method was found. The city of Albuquerque purchased most of the Grant outright (which required an increase in the city's sales tax), leaving the Academy with a low-elevation parcel which it uses for outdoor education. The city retained another low-elevation parcel for itself and traded the higher-elevation land to the Forest Service. Thus, the city of Albuquerque came to own much of the land on which the Elena Gallegos Cultural Resources Project was done.

The Elena Gallegos Land Exchange is the largest archeological project that the Forest Service has undertaken. It involved survey of 32,823 acres, on which 537 sites and many more isolated artifacts were found. Of these sites, 71 were archeologically tested and ten were fully excavated.

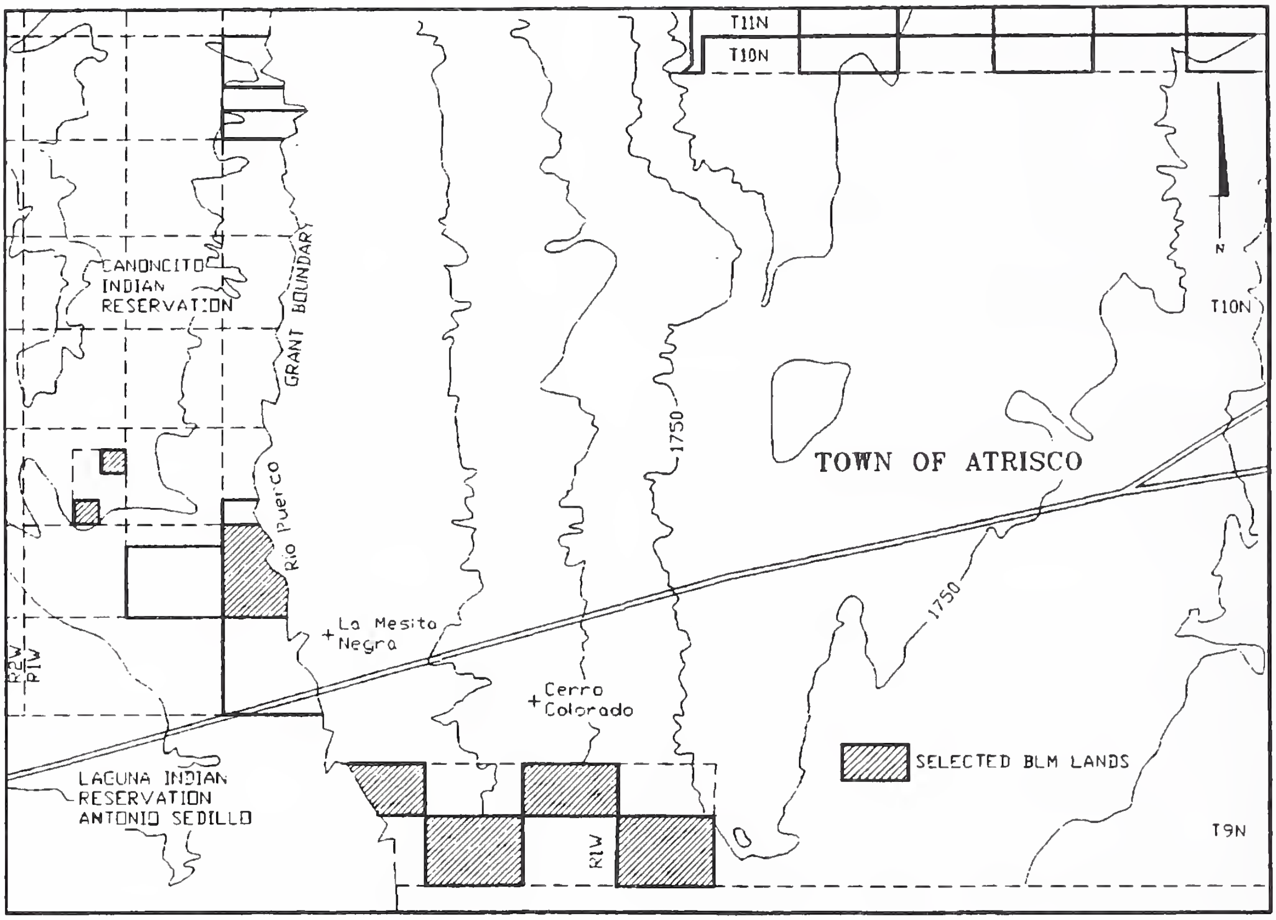
The number of sites tested and excavated might seem low relative to the number found. This is because a good part of the survey was on lands that, for one reason or another, were eventually dropped from the exchange. No sites were excavated on these lands. Furthermore, some lands with high densities of sites were traded to the city of Albuquerque without Forest Service excavation, but with the provision that the city would protect the sites and would undertake excavation before disposing of the land. This arrangement was acceptable to the State Historic Preservation Officer and the city is presently fulfilling its obligations under the agreement.

The BLM lands selected for exchange clustered in three areas: around Las Cruces in southern New Mexico, around Albuquerque in the central part of the state and around Farmington in the northwest. The reports of the archeological surveys are on file in the Laboratory of Anthropology, Museum of New Mexico, Santa Fe. The present document is a report on the testing and excavation conducted around Albuquerque. Separate volumes have been prepared for the Las Cruces and Farmington sections.

The Albuquerque project area involved three main localities. The Atrisco area (Map 1-1) lies on the Rio Puerco. It is a few miles west of Albuquerque, on both sides of Interstate Highway 40. [In the chapters that follow, when an author refers to Atrisco, it is this area that is meant -- not the Atrisco section of Albuquerque, which lies within the city limits on the west side of the Rio Grande.] The Placitas area lies north of Albuquerque. It is east of Interstate Highway 25 and encompasses the lower portion of the Las Huertas Valley and surrounding hills (Map 1-2). The third major area is the Ball Ranch. It, too, is east of Interstate 25, about midway between Albuquerque and Santa Fe (Map 1-3). The Albuquerque project area also included several small land parcels scattered in and around the Sandia Mountains. The historic sites studied in these areas are reported in Chapter 13.

The land exchange required several lines of environmental assessment, involving such fields as geology, paleontology, watershed, wildlife, soils, grazing and, of course, archeology. The cultural resources portion began in June 1981, when Dee Green, David Gillio and I were informed of the project and of the urgent need for archeological work. The three of us began immediately to plan for this work. Forest Service survey crews were in the field within two weeks and newly-hired crews shortly thereafter. Dee Green served as Project Director from June 1981 to September 1983. I assumed those responsibilities in October 1983, when the project was transferred from the Southwestern Regional Office to the Cibola National Forest. I served also, from the commencement of the project, as Principal Investigator for the Albuquerque area.

The survey phase in the Albuquerque area was conducted in two stages. The first was from June to August 1981 and included Placitas, the Sandia Mountain parcels and the area of the Atrisco A and B sites (the letters are crew designations). The second stage was in October and November 1981 and included the area of the Atrisco C sites and the Ball Ranch. I directed the first survey phase and the crew consisted, at various times, of Phil Dano, David Gillio, Bobby Gomez, Don Hall, John Hayden, Herbert Maschner, Bobby Meadows, Salomon Peralta, Glenn Reagan, Michael Robertson,



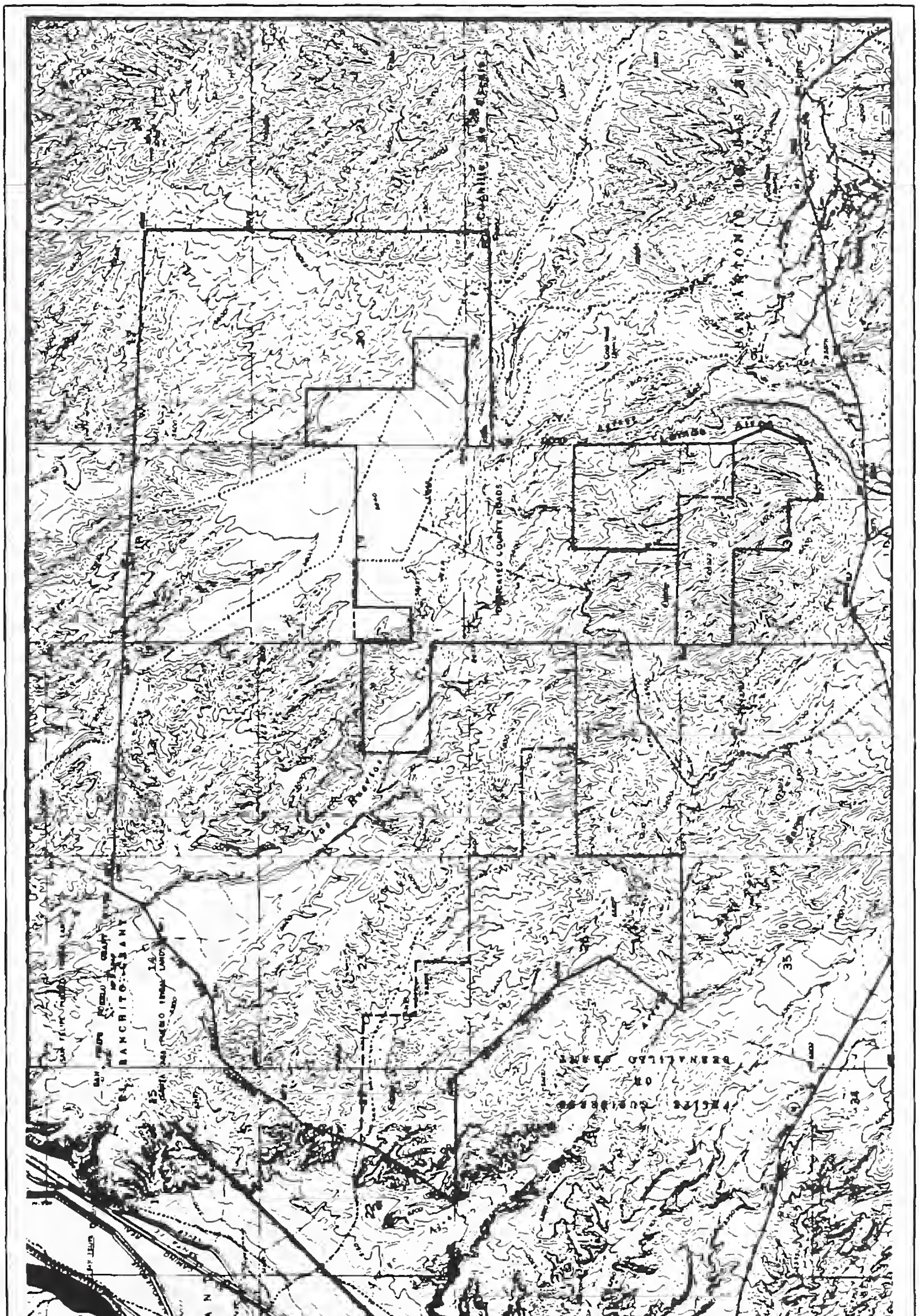
Map 1-1. The Atrisco Project Area.

Bonnie Bagley Tainter, Lisa Tanner (who supervised the "B" crew) and Joan Wilkes. The second phase was supervised by Charles Haecker, under the direction of Dee Green. The crew members were Vince Alderete, Jose Chavez, Tommy Chacon, Michael Cockran, Polly Davis, Robert Dickerson, Karen Diver, Peter Fleweger, Louanna Filler, Lou Gallegos, Emily Garber, Peggy Hockett, David Hutchinson, Mary Keith, Peter Morse, Wayne Oakes, Keith Oshins, Michael Rotunda, David Staley, Bert Starr, Laurel Wallace and Helene Warren. At any given time, of course, only a few of these were actually in the field.

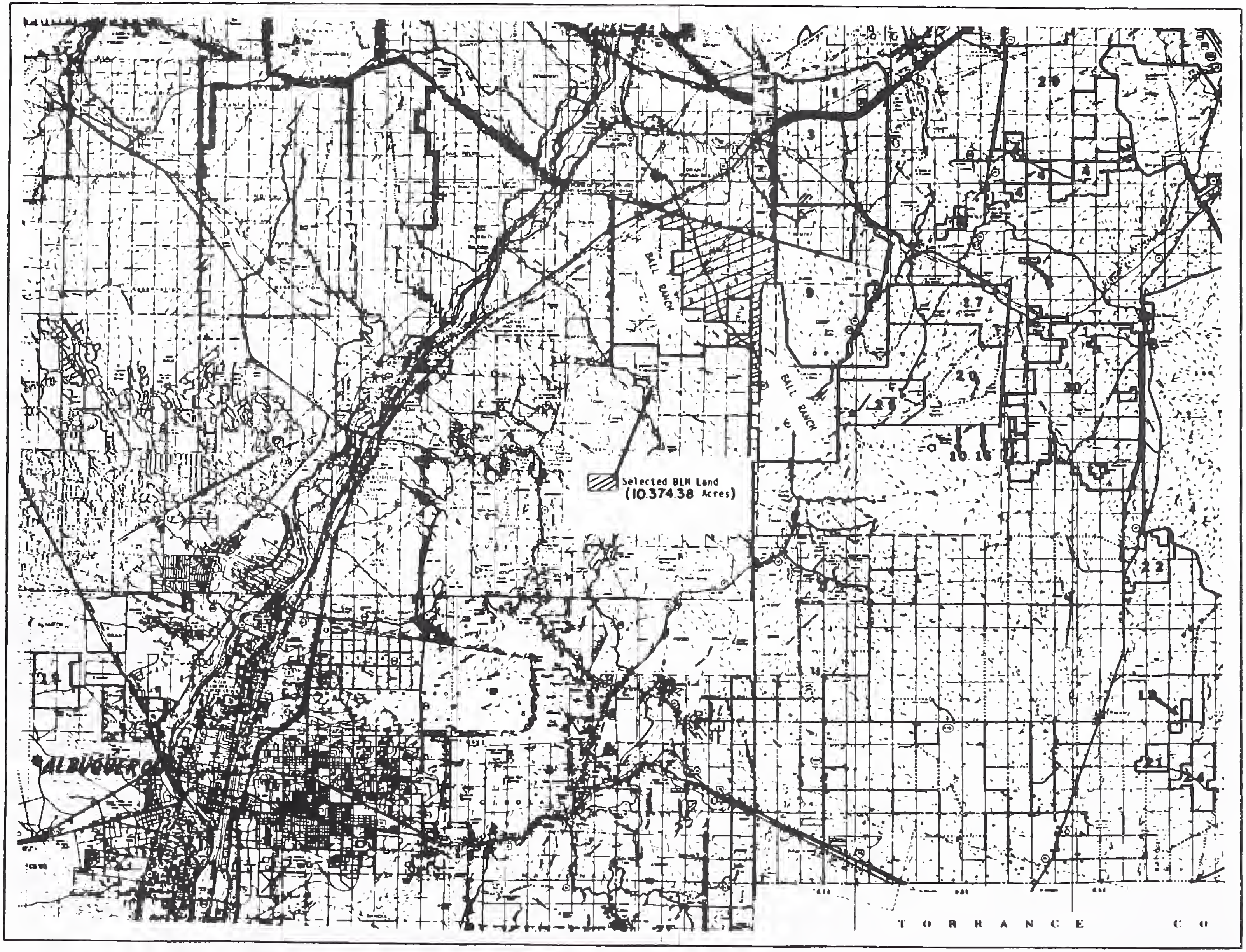
Testing also was conducted in two stages. In November 1981 I tested several sites in the Placitas area, with the assistance of Jacqueline Boaz, John Hayden, Bonnie Bagley Tainter, Emmet Tainter and Joan Wilkes. A second testing stage was supervised by Charles Haecker under the direction of Dee Green. It began in November 1981 and continued until June 1982. The crew members were Robert Dickerson, Peter Fleweger, Peter Morse, Wayne Oakes, David Staley and Bert Starr.

Full-scale excavations extended from June to August 1982. I served as overall director, while Charles Haecker supervised the work at PL 30A. The crews at various times included Gail Bailey, James Brandi, Karen Diver, Dee Green, Gail McPherson, Jeanne Schutt, Steven Street, Bonnie Bagley Tainter, Emmet Tainter and Helene Warren.

After the end of fieldwork, laboratory analysis, computer analysis and report preparation continued until late 1990. The laboratory crew consisted, at various times, of Gail Bailey, Jeff Boyer, James Brandi, Karen Diver, Stephen Fischer, Louanna Haecker, Mary Keith, David Legare, Gail McPherson, Carol Raish, Jeanne Schutt, Steven Street, Laurel Wallace and Helene Warren. Carol Raish capably supervised this work at times when I was assigned to other projects.



Map 1-2. The Placitas Project Area.



Map 1-3. The Ball Ranch Project Area.

Other persons who assisted with laboratory work and records management were Roy Becenti, Traci Bendaw, Polly Davis, Gabe Griego, Ruth Gotay, Linda Hall, Lois Klinsing, Wayne Jaekel, Diane Perea, Janet Sanchez and Helene White. Shirley Waters typed the many volumes of field notes and field forms. Robert McMahon prepared the photographs.

The computer data entry, a massive job, was done by Kent Hoke, Carmen Chavira, Andrew Todachene and Marilyn Vigil. The computer analyses were done by David Legare and James Snyder, both of whom wrote many custom programs for the project and worked out the many problems that inevitably arise in very large data bases.

Lela Bridge, Michael Johnson, Doreen Moya, Jane Murray, Louis Redmond, Wini Rutherford, Elaine Sigler, Norma Senn, Viola Swenson, Bonnie Bagley Tainter and Laurel Wallace helped with some of the myriad tasks needed to prepare a report of this size.

Research Framework

The excavations conducted in the Albuquerque project area were guided by a research design formulated in early 1982. Except for minor editorial corrections, this research design is reproduced below, exactly as it was submitted to the New Mexico State Historic Preservation Officer and the Advisory Council on Historic Preservation.

Introduction

Two basic ideas guided the proposed research. The first is that growth of population is a major determinant of cultural change. The second is that substantial areas of cultural behavior, and many instances of cultural change, can be understood under the Principle of Least Effort (Zipf 1949).

The framework linking these two principles has been set forth elsewhere (Tainter 1979b; Tainter and Gillio 1980), but will be briefly reiterated here for the sake of clarity. The Principle of Least Effort suggests that the adaptation a human group pursues at any point in time will be the one that meets the needs of the population at the least cost. If so, then any change in adaptation must be in the direction of increasing cost per unit of return. This perspective has proven immensely valuable in the study of subsistence (Boserup 1965; Asch, Ford and Asch 1972; Cohen 1977), technological (Glassow 1980) and organizational change (Tainter and Gillio 1980).

If changes in adaptation do universally involve increasing cost per unit of return, then rationally-acting human populations would be expected to undergo change, not on the basis of whimsy or caprice, but under the pressure of compelling need or perceived benefit. Several students of culture change have argued that the most regular source of such pressure is rising population, a persistent, if variable, fact of human history (Boserup 1965; Asch, Ford and Asch 1972; Cohen 1977; Glassow 1980; Tainter 1979b; Tainter and Gillio 1980).

Given these arguments, it becomes critical to know what factors may induce growth of population. A major element seems to be relatively sedentary existence, for in situations of high mobility the large amounts of work involved in transporting infants and baggage induces women consciously to space births at intervals of three to five years. Under conditions of sedentism, this built-in mechanism for limiting population is relaxed and birth rates rise (Lee 1972).

Sedentism itself can be induced by a variety of means. High population density can restrict mobility. Such a situation, however, would be of little interest to the present case, for I am concerned primarily with situations in which population changes in response to sedentism.

Sedentism may be expected to occur where a population's yearly consumption needs may be met from a single location. This opportunity may occur in environments that are highly productive and that produce foods that are storable, as in portions of the Eastern Woodlands, or where topographic diversity is high, as in the American West. Since precipitation tends to increase with altitude, topographic diversity corresponds in varying degrees with ecological diversity. Such diversity may make relative sedentism possible, if the different resource zones needed for year-round subsistence are so close at hand that they may be conveniently exploited from one or a few locations. Of course, not all areas characterized by topographic diversity are suitable for sustaining self-sufficient, sedentary human populations. Such factors as low environmental productivity or a short growing season remove some areas from the potential to support sedentary communities.

Certainly, high population density, intensive subsistence practices, complex technologies and sociopolitical complexity are known to co-occur throughout world history. This framework suggests that these variables are related, not only empirically, but functionally as well. In situations where sedentism is possible, unchecked growth of population inevitably causes subsistence strains and necessitates accommodating cultural adaptations. Such adaptations involve greater levels of effort per unit of return. In central New Mexico, this process resulted in such patterns of intensification as increasing use of marginal resource zones, agriculture, the development of labor-intensive irrigation complexes, the formation of large, aggregated towns, increases in social, ritual, and political complexity and the maintenance of trading relationships. These patterns will be discussed in more detail in the next section.

Within this framework it is necessary to monitor several variables in the archeological record. These include: population, subsistence, land-use patterns, technology and sociopolitical organization.

Interpretive Overview of Central Rio Grande-Rio Puerco Area Prehistory

The PaleoIndian period is well represented in the Albuquerque West Mesa-Rio Puerco-Rio San Jose area. Judge's (1973) survey disclosed the existence of Clovis, Folsom and Plano populations, which apparently used the region primarily for the purpose of hunting herds of megafauna. The region has produced both special-activity PaleoIndian sites related to hunting (Judge 1973), as well as a more substantial settlement (Dawson and Judge 1969). High altitude PaleoIndian sites are known from the adjacent Sandia-Manzano range (e.g., Hibben 1941).

Although PaleoIndian subsistence has usually been interpreted as focused on megafauna (Judge n.d., Irwin-Williams n.d.), there are substantial reasons for questioning this traditional view, at least in regard to the area of interest (Tainter and Gillio 1980:39-41). To begin with, our view of PaleoIndian subsistence as focal may be only an artifact of our inability to recognize PaleoIndian activities that did not result in the deposition of diagnostic lanceolate points. Furthermore, concentrating an economy so exclusively on a single faunal resource is ethnographically unheard of outside of the Arctic, and with good reason. Any focal strategy (much like monocropping) is inherently risky, since loss of the focal resource necessitates catastrophe. The proposition that PaleoIndian populations followed the more sensible strategy of subsistence diversity seems a research topic worthy of pursuit.

The major research into the succeeding Archaic period has been conducted by Cynthia Irwin-Williams (1973) in the Arroyo Cuervo region. The cultural-temporal sequence she delineated, which follows, has been widely adopted in Archaic research in northwestern New Mexico.

Jay	5500 to 4800 B.C.
Bajada	4800 to 3200 B.C.
San Jose	3200 to 1800 B.C.
Armijo	1800 to 800 B.C.
En Medio	800 B.C. to A.D. 400
Trujillo	A.D. 400 - 600

Irwin-Williams correlates the En Medio phase with Basketmaker II and the Trujillo phase with early Basketmaker III.

The earliest Archaic settlements in the Arroyo Cuervo region were apparently situated in locations of high diversity. There was correspondingly a high degree of sedentism among early Archaic populations in this region (Irwin-Williams 1973). Not surprisingly, Irwin-Williams (1973) notes a pattern of population growth throughout the Archaic. By perhaps the San Jose phase, the results of population growth were beginning to be felt. While during earlier times the strategy for coping with population growth may have been to establish new base camps, by the San Jose phase this process had led to such a degree of territorial restriction that a genuine subsistence change was called for. This involved a shift to increased use of small-package foods in the form of seeds and nuts.

In the succeeding Armijo phase, significant changes occurred in land use, technology and seasonality. Continued growth of population led to three adaptive responses: limited use of maize, seasonal aggregation and increased social and ritual complexity. These three developments were linked in a system both for augmenting the food supply and for evening-out variations in the harvests of individual groups (Tainter and Gillio 1980:98). Although this response was successful in the short-run, over the long-run it had the effect of accelerating population growth by circumventing important checks. Thereafter, even more pronounced population growth is evident in the area and further adaptive changes were soon necessary.

By the En Medio phase, locations of seasonal population aggregation along the Arroyo Cuervo multiplied. There was a shift to sharply demarcated seasonal camps and a pattern of seasonal transhumance developed which lasted into the Trujillo phase (Irwin-Williams 1973:11-15). Most dramatic, however, was the Archaic occupation of the West Mesa, a resource zone that is decidedly marginal when compared to the adjacent Rio Puerco, Rio Jemez and Rio Grande drainages. Following the PaleoIndian era, no portion of the West Mesa attracted substantial human use until the late Archaic, yet during the late Archaic the Rio Rancho area came to support a substantial pithouse-dwelling population (Reinhart 1967).

It would seem that, by the late Archaic, population in the region had reached such a level that expansion out of the river valleys onto the marginal West Mesa was necessary. It is no coincidence that this use of marginal areas follows closely in time the beginnings of maize horticulture, population aggregation, expansion of the settlement system and increased social and ritual complexity in the Arroyo Cuervo region. This pattern suggests that the late Archaic in this part of New Mexico was a time of substantial stress. Given this stress, it is not hard to understand why subsequent populations in the Basketmaker III period developed sedentary, agricultural adaptations (Tainter and Gillio 1980:97-99).

This discussion points to set of data requirements that must be met if this interpretation of Archaic prehistory is to be tested. These include:

1. The seasonality and function of individual Archaic sites.
2. Archaic systems of settlement.
3. Archaic use of differing locales.
4. Archaic population trends.
5. Archaic subsistence and organization through time.

By the Basketmaker III period the Rio Rancho area had been abandoned and populations shifted to the eastern half of the West Mesa overlooking the Rio Grande. In at least the Corrales area, they settled near washes having gentle gradients down to the river in locations suitable for floodplain agriculture (Frisbie 1967; Allan 1975). Similar sites are located in analogous positions across the Rio Grande at the western edge of the East Mesa (Peckham 1957).

In the Arroyo Cuervo-Rio Puerco area, the late Basketmaker/early Puebloan periods have been termed the Sky Village (A.D. 600 to 700) and Loma Alta (A.D. 700 to 850) phases (Irwin-Williams 1973). Here, too, settlement shifts reflect the transition to major reliance on agriculture during this period. Populations abandoned the high diversity setting of the Arroyo Cuervo for the lower diversity, wide valley bottom of the Rio Puerco floodplain. Subsequent populations in the area coped with continued population growth by expanding into marginal agricultural areas (Tainter and Gillio 1980:49). By the early 1300s, for reasons not yet understood, the upper Rio Puerco was abandoned, although occupation continued along the lower Puerco (to the south of the Atrisco area) until the late 1400s.

The Puebloan prehistory of the Bernalillo area, until about 1300 A.D., is not well known. Populations of agriculturalists, in both pithouses and surface structures, are known to have continued occupation of the region (Allen and McNutt 1955; Allen 1970; Frisbie 1967; Peckham 1954, 1957; Schorsch 1969; Skinner 1965). To the north, in the Santa Fe River area, Dickson 1979:36-42) found population growth during this time, while Wendorf (1954a:206; Wendorf and Reed 1955:140) notes a significant increase in the number of sites in the Rio Grande region shortly after 900 A.D.

Wendorf further notes abrupt population increase late in his Coalition period, or late Pueblo III (1954a:211; Wendorf and Reed 1955:146-147). Dickson observed a similar pattern along the Santa Fe River (1979:40-41). Both authors (following earlier investigators) ascribe this major jump to the movement of new populations into the Rio Grande Valley. Wendorf suggests that this intrusion resulted from the depopulation of the San Juan Basin (1954a:211; Wendorf and Reed 1955:146-147). In the succeeding Classic period (A.D. 1325 to 1610), the Rio Grande Valley was characterized by large, aggregated settlements of the sort encountered at contact.

Within the framework developed above, important research topics for the late Basketmaker and Puebloan eras include:

1. Population levels and trends.
2. Subsistence and organization through time.
3. Patterns of land use through time.

In summary, the archeological record of this area suggests growth of population from early in the Archaic until at least the late thirteenth century. The responses to continually rising population included subsistence and technological change, increasing complexity in social and ritual structures and changes in land use.

The Proposed Research

One of the constraints of cultural resources management is that research must be conducted in parcels of land that may not allow the delineation of systems of past land use. An approach for dealing with this problem in cultural resources management surveys has been discussed elsewhere (Tainter 1979a). The case for mitigation situations is analogous. Any single mitigation case may not provide all data needed for the resolution of regional research frameworks, such as the one sketched above. Yet such geographically limited investigations can yield information pertaining to components of a regional land use system and can contribute in this way toward the ultimate testing of the overall research problem. The call for the development of regional research designs, so often heard in cultural resources management, is based on precisely this principle.

Such an approach will be followed in the present case. The archeological sites of the Placitas and Atrisco areas cannot be understood divorced from their regional contexts. Most particularly, the Puebloan sites along Las Huertas Creek cannot be understood except in the context of the population concentrations along the nearby Rio Grande. Since that larger context is not available for investigation by the present project, research will concentrate on those data that will ultimately contribute to a test of the broader research framework. With this in mind, the following research is proposed for the sites to be studied in mitigation of effects of the land exchange.

Archaic

Placitas Area

Site PL 38A contains a structure that displays a cleared area along a bluff, ringed on the opposite side by a line of stones. These stones probably served as the base for a wickiup-like superstructure. An early Bajada point (about 4800 B.C.) was found on the surface within the structure.

Archaic structures are rarely found in New Mexico. A substantial, though fragile, facility of this type represents a considerable investment in both construction and maintenance. This would be unexpected in situations of high mobility. This site seems to be relevant to the problem of sedentism in the Archaic.

Atrisco Area

Sites AT 1A and AT 35C yielded material dating to the En Medio phase (Late Archaic - Early Basketmaker, about 800 B.C. to A.D. 400). This time period is crucial for understanding both the long-term effects of Archaic population growth, as well as the pattern of subsequent adaptations. It was during the En Medio phase that continued population growth necessitated expansion of the settlement system, culminating in the Archaic occupation of the West Mesa. The En Medio phase was a period of severe stress and represents the limits of population sustainable in this area by a hunting and gathering/horticultural adaptation (Irwin-Williams 1973; Tainter and Gillio 1980:47-48).

Sites AT 1A and AT 35C present the opportunity to investigate in detail the subsistence and land-use strategies of En Medio phase populations in the Atrisco area. Viewed within the context of the research framework, these sites are relevant to understanding the critical shift to reliance on agriculture.

Certain characteristics of site AT 36C suggest that it might date to the Archaic period. These include lack of ceramics and quantities of fire-cracked rock. It i possible, however, that this might be a special-use sit dating to the Puebloan era. One of the efforts in furthe investigating the site will be to date it. If it does date t the Archaic period, it will be studied within the contex of research topics appropriate to that era: sedentism mobility, population trends, subsistence and land-us patterns. If it dates to the Puebloan era, it will b investigated with the objective of augmenting our knowl edge of Puebloan subsistence-settlement systems in th Atrisco area.

Puebloan

Placitas Area

Site PL 30A is a small masonry pueblo exhibiting ceram ics that suggest a date of about A.D. 900 to 1100. It i the earliest Puebloan structural site yet recorded in th Las Huertas drainage. The placement of this site in a location which had heretofore not been used in this wa by Puebloan peoples may be related to the populatio and settlement expansion which occurred in the Ri Grande area after A.D. 900 (Wendorf 1954a; Wendor and Reed 1955; Dickson 1979). It is entirely possibl that population growth impelled this use of Las Huerta Canyon.

Whether PL 30A was a field house, used as a summe agricultural camp by populations otherwise residen elsewhere, or whether it was itself a permanent settle ment, remains to be determined. Each alternativ would imply differing adaptations to population growt in the region. The establishment of field houses woul indicate that individual communities were increasin the areal extent of their resource bases, implying th formation of larger, more highly integrated communi ties. In contrast, the formation of daughter settlement would imply attempts at maintaining community stabil ity, so that excess population is handled, not by increasin organization, but by emigration.

Site PL 32A is another small masonry site. The bes ceramic date for the site would be about A.D. 1490 t 1515. It is one of many Classic period masonry sites i Las Huertas Canyon. Indeed, the canyon seems to hav experienced a major increase in use at this time, sinc the overwhelming majority of the Puebloan structura sites in this area date to the late Coalition and Classi periods. This expansion into Las Huertas may hav been a result of the pressures exerted on the Rio Grand area by the abandonment of the San Juan Basin (Wendor 1954a; Wendorf and Reed 1955; Dickson 1979).

Again, the different strategies suggested by the estab lishment of field houses versus daughter communitie are worth investigating in the Classic occupation of the area. At least some of the Classic period sites are large enough that they may have served as long-term settlements.

Atrisco Area

Site AT 31C contains a Basketmaker III/Pueblo I occupation. The early Anasazi era, as discussed previously, witnessed the shift to major reliance on agriculture. The stresses evident in the preceding periods make this adaptive change intelligible without resorting to the diffusionary explanations that are so often used to account for the adoption of agriculture.

Site AT 1A contains components dating in the intervals A.D. 750 to 1100 and A.D. 1150 to 1300. Combined with the En Medio components at AT 1A and AT 35C, and the earlier agricultural component at AT 31C, these components provide a nearly complete local sequence running from late Archaic/early Basketmaker (AT 1A, AT 35C) through late Basketmaker and early Puebloan (AT 31C), through later Puebloan (AT 1A). Such a sequence provides the opportunity to contrast terminal hunting and gathering with initial agricultural with developed agricultural adaptations, with the goal of ascertaining stress responses in each.

Data Requirements

The research framework imposes a rather uniform set of data requirements. Of interest within the research framework are such factors as population, subsistence, land-use, technology and sociopolitical organization (as described above). Translated into practical terms, the potential contribution of each site to assessing the research framework can be realized by collecting data relating to site function, seasonality, group composition, task performance, length and intensity of occupation and subsistence pursuits. The following types of information will contribute to clarification of these topics.

- Site Function: the combined patterns suggested by the other topics.
- Seasonality: number and placement of hearths; floral, pollen and faunal remains; tool assemblages.
- Group Composition: tool assemblages; activity areas; burials.
- Task Performance: tool assemblages; activity areas.
- Length/Intensity of Occupation: relative debris densities.
- Subsistence Pursuits: floral, pollen and faunal remains; tool assemblages.

Readers curious about this research design may consult Chapter 14 to see how it fared.

Chapter 2 • Test Excavations

Jack B. Bertram and Galen R. Burgett

Introduction

This report describes the results of testing carried out on 37 prehistoric and historic sites of the Atrisco and Placitas Sectors, Elena Gallegos Land Exchange Project. The Atrisco Sector is located on portions of the original Atrisco Land Grant, on the bajadas, slopes and bottomlands of the Rio Puerco valley north and south of Interstate Highway 40 west of Albuquerque. The Placitas Sector is located in the upper middle drainage of Las Huertas Creek and in adjacent drainages northwest of the town of Placitas, New Mexico. It is composed of platted land roughly bounded by the Felipe Gutierres/ Bernalillo, San Felipe Pueblo, El Ranchito, and San Antonio de las Huertas land grants.

Fieldwork for testing of these sites was done by Forest Service crews in variably difficult field conditions during the period of November, 1981, through June, 1982. Field testing included mapping, collection, shovel and auger testing, and the excavation of formal test pits as appropriate. Collected samples included ceramics, lithic artifacts, soil and macrobotanical samples, obsidian hydration samples, pollen samples, radiocarbon samples, dendrochronological samples and archaeofaunal bone and shell.

Laboratory analysis of collected samples was carried out over the period from 1982 through 1986. As of this writing, analyses of all specimens considered worthy of study, with the exception of the lithic artifacts, have been completed.

Documentary research for this report was carried out by the authors. We worked with a substantial data base in the course of report preparation. Data made available by the Forest Service included initial site summary manuscripts, as well as original field notes and maps, field photographs, some artifact illustrations and field specimen catalogs. The Forest Service also provided consultants' manuscripts describing the results of pollen, macrobotanical, ceramic and faunal analyses.

The results of analyses on dating samples were made available to us either as summary data organized by general proveniences or else as copies of original lab reports. The format for radiocarbon dates presented below is in conformity with current usage: uncorrected age B.P., followed in parentheses by the laboratory code and sampling number, and the 95% probability range and midpoint dates as calculated from the Klein et al. (1982) consensus calibration. The obsidian hydration analyses rely on induced hydration rate determinations developed by Michels (1984a, b, c, d, 1985, 1987), on visual sourcing, and on hydration rind determinations made by the U.C.L.A. Obsidian Hydration Laboratory. Materials codes for obsidian sources follow Warren (1977).

In the following sections, sites are discussed in ascending field site number order <u>within work areas</u>, in order to preserve spatial contiguity between nearby sites. All sites described below are numbered according to their original field designations, which were of the form "AT mkx" and "PL mkx." The prefix "AT" or "PL" signifies "Atrisco" or "Placitas" sector, respectively. The "m" indicates a within-unit site number, "k" indicates the crew letter designation, and "x" (where it appears) indicates a sub-site or locus designation. The reader is cautioned not to confuse the work-unit letter designation with the sub-site designation; as examples, Atrisco site AT 12B is <u>in no way related</u> to Atrisco site AT 12A, but AT 18C1 and AT 18C2 are both loci of Atrisco site AT 18C.

The Atrisco Sites

Jack B. Bertram

Site AT 1A

Site AT 1A is a very large multicomponent lithic and sherd scatter with associated ground stone and burned rock (firecracked rock, or fcr) scatters. The site produced evidence of occupations possibly ranging in age from the late Archaic through Pueblo III times. It was assigned the Laboratory of Anthropology site number LA 33898.

Location

The site is located in Township 9N, Range 1W, Section 10. It overlooks the Rio Puerco channel and lower flood plain and is set at the edge of the lowest terrace bench. The present entrenched river channel lies about 200 meters west of the site center. The site has been substantially eroded due to the encroachment of lateral meanders of the Rio Puerco. It presently sits at the top of a cut bluff which approaches 40 feet (12.2 meters) in height in places. Portions of the site are preserved only in and on relict bajada pedestals, but other sections seem to be relatively uneroded.

Survey and Testing

The site was characterized on survey as a very large scatter of burned rock, lithics, and ceramics, composed of nine loci or sub-sites and one isolated sherd. It extends over 75,000 square meters of concentrated scatter and over a much larger dispersed area. The site was partly unvegetated; dominants included mormon tea, sage, tamarisk, saltbush, sacaton, other grasses and snakeweed. Lithic items were reported to be predominantly of chert. Ceramics included Lino Gray, Kiatuthlanna Black-on-white, and Socorro Black-on-white varieties. Of the nine loci, one was later separated as site AT 37C, two were tested, and the remainder (some of which proved to lie outside the survey boundary) were dropped from further study.

The site was tested from January 19 to 22 and on January 25, 1982. A second session of work aimed at site excavation, conducted August 10 and 11, 1982, was terminated without additional excavation after initial recordation and grid surface collection. The January testing session consisted of setting Datum Points A and B in Loci 1 and 2, respectively. All further work was referenced to these two points. Mapping and surface collection of all diagnostics, all flaked formal tools, and a sample of groundstone items from both Locus 1 and Locus 2 was done. This was followed by total collection, shovel testing at five feet (1.5 meters) intervals, and auger testing within shovel tests along a grid transect of 3 by 100 feet (.9 by 30.5 meters), originating at Datum A and extending east-northeastward across Locus 1 (Table 2-1). Two formal test pits were dug (Map 2-1). All fill was screened.

The August testing session consisted of collection of one meter square units over approximately 450 square meters in two rectangular blocks within Locus 1. Since this second collection was not completed, it cannot be used as a basis for mapping surface densities. At least 140 collection samples (including multiple samples from single grid units) were taken. These were comprised mostly of lithics, but groundstone was also collected. No excavation was done in the August session.

Surface Description

Locus 1 is described as a moderate concentration of artifacts lying on a bench between two small, deep arroyo channels. Most of the concentration was found to lie outside the project area to the south. Formal artifacts noted and/or collected included two corner-notched dart points, four other points or point fragments for which no data are available, 33 bifaces or fragments, an anvil stone, 17 manos or mano fragments, 10 other groundstone fragments, a hammerstone, a scraper, a biface/scraper, and a sherd. An ash stain (Feature 1) was recorded ten meters north and 2.6 meters east of Datum A. Numerous (approximately 300) flakes and microflakes were also collected (Table 2-1).

Locus 2 collections seem to have included only a projectile point, a point fragment, and a biface. The testing map for this locus shows that seven tools in all were plotted; charcoal was noted in one area of the locus.

Subsurface Testing

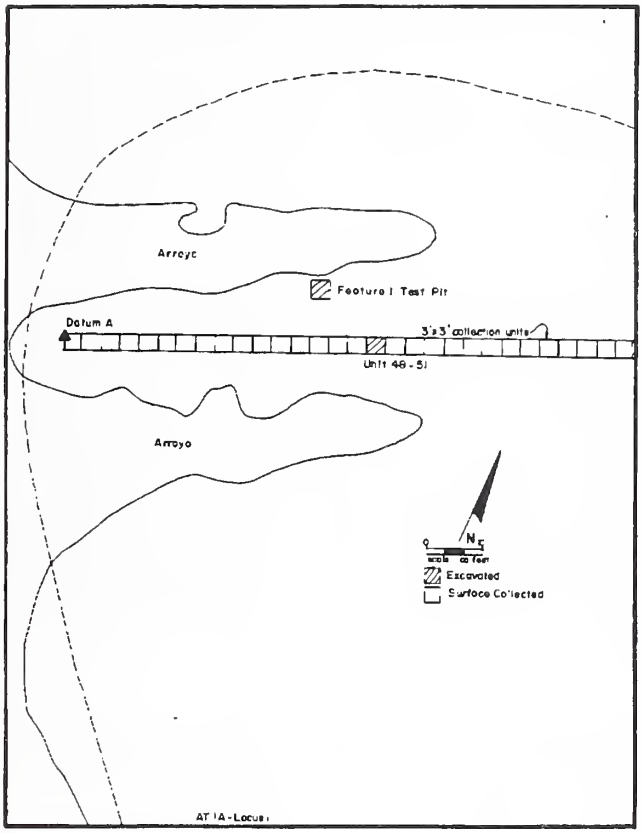
Shovel and auger testing was carried out along the 3 feet by 100 feet (.9 meters x 30.5 meters) grid collection transect. Shovel tests appear to have been dug to 30 centimeters depth, after which a bucket auger was used to test down another 20 centimeters, to a total of 50 centimeters depth. All fill was screened. All 21 shovel tests produced lithic items; in addition, the test at 25 feet (7.6 meters) produced groundstone, and the tests at 50 feet (15.2 meters), 60 feet (18.3 meters), and 65 feet (19.8 meters) produced bone. The tests at 45 feet (13.7 meters) and 55 feet (16.8 meters) seem to have encountered charcoal staining at about 30 centimeters depth.

A formal test pit (Pit 1) was dug to evaluate Feature 1. This pit, three by three feet (.9 by .9 meters) in dimension, was excavated to 40 centimeters depth in the southwest quadrant and to 30 centimeters depth elsewhere; excavation was by ten centimeters levels and carried out in halves (north and south). The southwest quadrant was further tested to 70 centimeters depth using an auger. The unit, which appeared to contain an intact hearth, proved to be composed of dispersed ash and charcoal in loose sand, underlain at about 30 centimeters depth by a harder sandy clay. This stratigraphic sequence was also encountered in most shovel tests. About 90 flakes, a piece of groundstone, and a core were recovered, along with bone. Most materials were found in the upper 20 centimeters of the deposit, which may have been disturbed by a clay-filled rodent burrow. A flotation sample was collected from the probable hearth fill. A pollen sample was collected from the south half of Level 2 (16 centimeters depth), possibly from the burrow fill. A clay sample was collected from the fill of the tunnel.

A second test pit (Pit 2) was excavated in the collection unit at 48-51 feet (14.6-15.4 meters) east of datum. This excavation proceeded in 20 centimeters arbitrary levels. Ashy soil with charcoal, burned and unburned bone, and hundreds of flakes was encountered. Cultural inclusions became less abundant as the excavation deepened. A hard red-orange sandy lens, possibly a use surface or floor, was encountered at 53 to 67 centimeters depth (Fig. 2-1). Tests in the north half of the unit through this surface to 68 centimeters depth proved to be sterile except for charcoal flecks possibly introduced by rodent disturbance. No special samples were collected other than a macrobotanical collection from 20-40 centimeters depth.

Analyzed Samples

Samples analyzed from AT 1A include ceramics collected on survey, flotation seeds and charcoal from Feature 1,



Map 2-1. Site AT 1A

screen-collected macrobotanical specimens from Test Pit 2, pollen from the surface and fill of Feature 1, and bone materials from the surface, shovel tests, and both excavated test pits. All but the ceramics are from Locus 1. Since ceramics are not mentioned in survey records as being present for Locus 1, presumably the ceramics collected on survey pertain to other loci.

Ceramics (Warren and Warren, this volume) collected on survey and the one sherd collected in testing included Lino Gray (13 jar sherds), Kiatuthlanna B/w (8 bowl sherds), Kana'a Gray (1 jar sherd), unknown (Mineral) B/w (1 bowl and 2 jar sherds), Socorro B/w (2 jar sherds), and Santa Fe B/w (1 bowl sherd). It appears that either the Socorro or the Santa Fe sherd was found on Locus 1.

Identified macrobotanical specimens (Toll, this volume) from Feature 1 included probably intrusive goosefoot, purslane, and tansy mustard seeds (one seed per species) and charcoal dominated by saltbush with lesser amounts of willow/cottonwood. The sample from Test Pit 2 was entirely ear fungus; this surface species, which grows mainly on conifer logs, was thought by Toll to indicate intrusion or disturbance.

Pollen samples from the surface of Feature 1 and from the probable rodent burrow below Feature 1 (Scott, this volume) were analyzed. The surface sample indicated

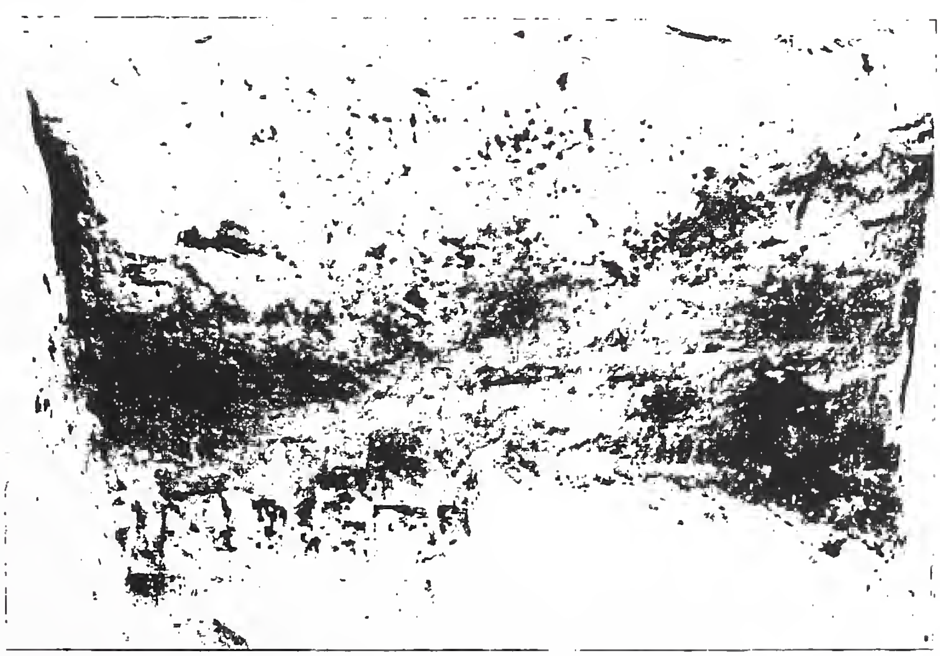


Figure 2-1. Test Pit 2 in Site AT 1A.

Table 2-1. Site AT 1A, Shovel Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
Test 1	A	00.00	77	A	D	No
Test 2	A	1.52	77	A	D	No
Test 3	A	3.05	77	A	D	No
Test 4	A	4.57	77	A	D	No
Test 5	A	6.10	77	A	D	No
Test 6	A	7.62	77	A	D,G	No
Test 7	A	9.14	77	A	D	No
Test 8	A	10.67	77	A	D	No
Test 9	A	12.19	77	A	D	No
Test 10	A	13.72	77	A	D	No
Test 11	A	15.24	77	A	B,D	No
Test 12	A	16.76	77	A	D	No
Test 13	A	18.29	77	A	B,D	No
Test 14	A	19.81	77	A	B,D	No
Test 15	A	21.34	77	A	D	No
Test 16	A	22.86	77	A	D	No
Test 17	A	24.38	77	A	D	No
Test 18	A	25.91	77	A	D	No
Test 19	A	27.43	77	A	D	No
Test 20	A	28.96	77	A	D	No
Test 21	A	30.48	77	A	D	No

Key: B - Bone, D - Debitage, G - Groundstone

cheno-ams, grasses, mormon tea, sage and composites, all locally characteristic, as well as locally specific cattail and wind-transported juniper and pine/pinyon. The subsurface sample was too sparse to analyze.

Bone samples (Bertram, this volume) included 150 pieces. All the clearly cultural bone was referred to cottontail and jackrabbit; a mouse and a small sciurid may be intrusive. Bone was generally burned or else very eroded, suggesting that much archaeofaunal material had been lost through in-situ decomposition. No clear differences could be found between surface, near-surface, and deeper samples in terms of species abundance, element representation, or bone preservation.

Comment

The data from this site suggest that Locus 1 may represent one or more partly deflated gathering, processing, or habitation loci, pertaining mainly to the Archaic period or to aceramic occupations. A subterranean structure or buried occupation surface may have been found in Test Pit 2. Locus 2 characteristics are not determinable from the summary data available, but this locus may have been occupied more extensively in the ceramic period than was Locus 1.

Site AT 3B

Site AT 3B is a small, concentrated scatter of lithic and ceramic artifacts associated with a probable cobble-lined hearth. It has been assigned the Laboratory of Anthropology number LA 33898.

Location

The site is located in an unplatted portion of Section 10, Township 9N, Range 1W, just within the Town of Atrisco Grant. It lies on and around a low rise (only 10 to 15 meters in diameter) set upon the lower bajada at the foot of the Llano de Albuquerque, overlooking the Rio Puerco floodplain and river, which runs one kilometer to the southwest. The site's elevation is 5305 feet (1617 meters). It is sparsely vegetated by grasses and is paved with pebbles, suggesting that heavy sheetwashing and/or deflation has occurred.

Survey and Testing

The site's survey description is not consistent with its testing description; consequently the former is not presented here. The site was tested on January 27, 1982, by relocating artifacts and the feature, establishing a datum, and preparing a surface map. All diagnostic items and tools were collected by compass-and-pace provenience. A collection grid measuring 3 by 100 feet (.9 by 30.5 meters) was then laid out west from datum across the densest portion of the surface scatter. All items within the grid were collected in three by three feet (.9 by .9 meters) grids. Shovel and auger tests were then placed every five feet (1.52 meters) along the grid (Table 2-2). Shovel excavation proceeded to 30 centimeters depth, and augering was used to test within the shovel cuts to 50 centimeters depth. Two auger tests to a depth of 20 centimeters were then placed into the possible hearth, Feature 1. Several additional auger tests were placed across the top of the rise; these were negative and their coordinates were not recorded. Shovel and auger fill was screened.

Surface Description

Surface examination (Map 2-2) revealed a lithic, ceramic, and groundstone scatter approximately 50 meters in diameter lying on and to the west of the slight rise. Surface collection recovered all recognized formal chipped tools, all ceramics and a judgmental sample of groundstone. Items recovered included an obsidian corner-notched projectile point, a core, three bifaces, a hammerstone, a shaft straightener, and several pieces of shell and groundstone, as well as many flakes and over 100 sherds (Table 2-2).

A cobble-lined hearth with visible charcoal contents was mapped as lying just off the rise and approximately ten meters north and ten meters west of datum, which was placed on the eastern summit of the rise. The collection transect recovered artifacts in densities well in excess of one item per square meter over most of its length, with lower densities indicated only as it approached the western concentration boundary.

Table 2-2. Site AT 3B, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
Shovel Test 1	00.00	270	50	D,O	No
Shovel Test 2	1.52	270	50	D	No
Shovel Test 3	3.09	270	50	D	No
Shovel Test 4	4.57	270	50	D,F	No
Shovel Test 5	6.10	270	50	D,S	No
Shovel Test 6	7.62	270	50	D,S,O	No
Shovel Test 7	9.14	270	50	D,S	No
Shovel Test 8	10.57	270	50	D	No
Shovel Test 9	12.92	270	50	D,S	No
Shovel Test 10	13.72	270	50	D,S	No
Shovel Test 11	15.24	270	50	B,D,S	No
Shovel Test 12	16.76	270	50	D,S	No
Shovel Test 13	18.29	270	50	S	No
Shovel Test 14	19.81	270	50	S	No
Shovel Test 15	21.34	270	50	-	No
Shovel Test 16	22.86	270	50	D,S	No
Shovel Test 17	24.38	270	50	D,S	No
Shovel Test 18	25.91	270	50	D,S	No
Shovel Test 19	27.43	270	50	S	No
Shovel Test 20	28.96	270	50	S	No
Shovel Test 21	30.48	270	50	D,S	No

Key: B - Bone, D - Debitage, F - Formal Chipped stone tools, S - Sherds, O - Shell Ornaments.

Table 2-3. Site AT 5B, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Distance (m)	Bearing (degrees)	Depth (na)	Contents	To Bedrock?
Shovel Test 1	30.00	104		-	No
Shovel Test 2	28.00	104		-[1]	No
Shovel Test 3	26.00	104		-	No
Shovel Test 4	24.00	104		-	No
Shovel Test 5	22.00	104		D	No
Shovel Test 6	20.00	104		-	No
Shovel Test 7	18.00	104		D	No
Shovel Test 8	16.00	104		D	No
Shovel Test 9	14.00	104		-	No
Shovel Test 10	12.00	104		-	No
Shovel Test 11	10.00	104		-	No
Shovel Test 12	8.00	104		D	No
Shovel Test 13	6.00	104		-	No
Shovel Test 14	4.00	104		D	No
Shovel Test 15	2.00	104		D	No
Shovel Test 16	00.00	-		D	No

Key: D - Debitage [1] Plus a possible core.

Subsurface Testing

Shovel and auger tests along the transect, of which 21 were placed, recovered flakes and microflakes in most cases. Sherds were recovered from all tests except for those placed less than 20 feet (6.1 meters) from datum and for the test at 70 feet (21.34 meters) west of datum, which last was sterile. In addition, the test at 100 feet (30.48 meters) encountered charcoal at 30 to 35 centimeters depth. The tests at datum and at 25 feet (7.62 meters) encountered shell. The test at 15 feet (4.57 meters) recovered a drill tip, and the test at 50 feet (15.24 meters) produced bone. Tests indicated that the site was mostly surficial, with a stratigraphic profile generally grading from soft dry sand into harder, wetter sands. Sandy clay was encountered at the bottom of a few tests. In most cases, artifacts were found very near the surface.

One of the two tests into the hearth produced microflakes, but the other produced no artifacts. These tests indicated that the hearth feature was surficial; ash extended only to two or three centimeters depth below surface.

Analyzed Samples

Samples from this site were restricted to obsidian, ceramics (Warren and Warren, this volume) and fauna (Bertram, this volume). Fauna consisted of eight pieces of eggshell (probably turkey eggshell) and a jackrabbit-sized shaft fragment, which had been burned. The ceramics indicate an extensive use of the area by groups with trade ties to eastern Arizona, the upper Little Colorado, the Rio Salado, the north-central Rio Grande, and the Tijeras Canyon area. A total of 139 sherds was analyzed; of these, 28 were from bowls and 111 were from jars.

Kana'a Gray (3 sherds) may indicate an early occupation. Escavada B/w (4 sherds), Reserve-Snowflake B/w (2 sherds), Cebolleta B/w (1 sherd), Chuska B/w (1 sherd), Chaco Corrugated (34 sherds), and Puerco B/w (2 sherds) would seem to suggest late Pueblo II and early Pueblo III use. Socorro B/w (7 sherds), Tularosa B/w (1 sherd), Pilares Banded (3 sherds), Los Lunas Smudged (1 sherd), Santa Fe B/w (1 sherd), Wiyo B/w (1 sherd), and Corona Corrugated (54 sherds) would seem to indicate use in later Pueblo III and early Pueblo IV times. An additional 26 sherds were decorated but undiagnostic, plain, or smudged brownware. Temper analysis placed most of these types' areas of production in a manner consistent with accepted type descriptions.

An obsidian projectile point, found on the surface, was sectioned by the U.C.L.A. Obsidian Hydration Laboratory for hydration rind thickness determination (2.6 microns). The point was a corner-notched arrow point, generally considered to be most characteristic of Basketmaker III-Pueblo II times but possibly dating to any time after about A.D. 200 (Bertram 1987; Thoms

1977). Of an opaque black vitrophyric obsidian, it probably is best referred to Pumice Mountain ("Grants") obsidian. If that source is correct, Michels' (1984a) induction determination would indicate an age of 329 B.P., assuming hydration temperatures comparable to those at Albuquerque: yearly mean of 13.4 degrees C. and yearly variation of 24.4 degrees C., implying an effective hydration temperature of 17.43 degrees C. equivalent.

If, however, the obsidian is actually an opaque variant of one of the Jemez obsidians, it could date to an age as great as 1078 B.P., using the rate for the very slowly hydrating Cerro del Medio obsidian (Michels 1987). Most probably, the point is actually of Pumice Mountain vitrophyre, but has been sandblasted, reducing its hydration rind thickness.

Comments

The concentration at AT 3B of so many different types of pottery, including exotics and types with non-overlapping production, indicates substantial long-range traffic through this area. This resulted in numerous pot-drops or ceremonial (shrine) deposition of sherds. It may indicate local group re-use of an otherwise undistinguished location over a long time period and/or the presence of associated but undetected larger sites in very close proximity. Whatever the explanation, the ceramic assemblage from this otherwise unremarkable small site is remarkable in its diversity, approaching that of the largest central places of the Pueblo II through Pueblo IV Anasazi.

Site AT 5B

Site AT 5B is a small lithic scatter with an associated Territorial period pot drop. It has been assigned the Laboratory of Anthropology site number LA 33905. The site is located 200 meters east of AT 3B, on the lowest slopes of the Llano de Albuquerque Ceja, at 5330 feet (1624 meters) elevation. The site is set on a slight southwesterly ridge within a cobble-gravel field which contains abundant Santa Fe chalcedonies and other knappable stone. The site overlooks the Rio Puerco floodplain. Vegetation is sparse, consisting of grasses, sage and other shrubs, and stunted junipers.

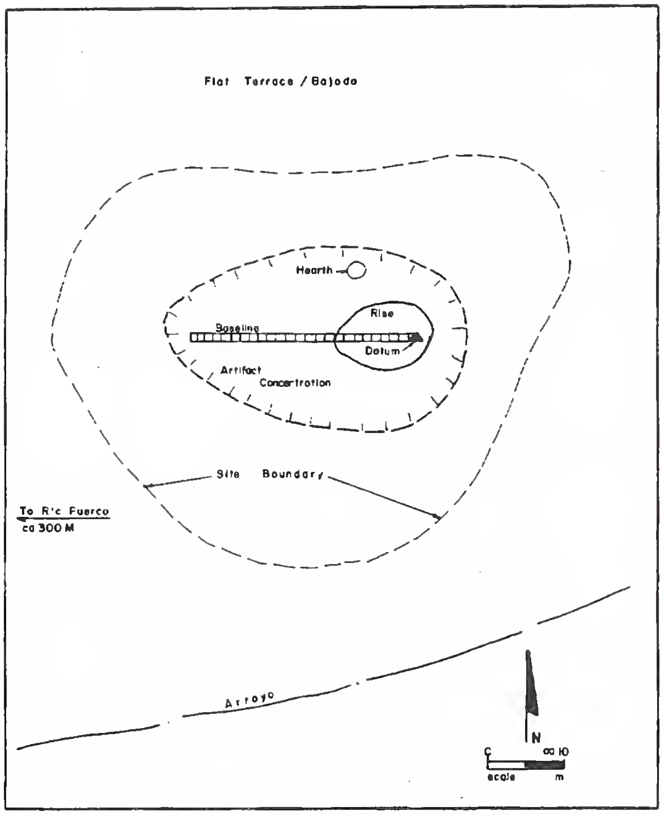
Survey and Testing

The site was described on survey as a sparse lithic scatter and possible quarry site. It was tested on January 28, 1982. Testing consisted of relocating and defining the scatter, setting a datum stake in the scatter's center, and mapping and collection of all formal flaked tools. A one by 30 meters collection transect grid, oriented along an east-southeast baseline, was laid down to the east of datum; all surface materials within this grid were collected in one square meter units. Units were numbered starting at the east end of the transect. Shovel and auger tests were then placed along the transect at intervals of two meters (Table 2-3). Additional unspecified and unplotted auger tests were placed elsewhere in the site. All fill was screened.

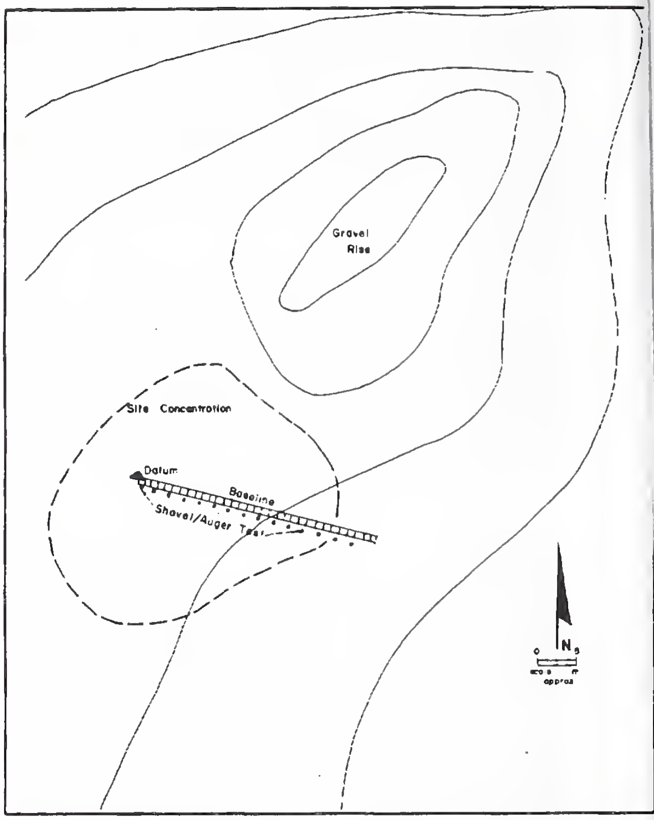
Table 2-4. Site AT 6B, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Datum	Distance (m)	Bearing (degress)	Depth (cm)	Contents	To Bedrock?
Shovel Test 1	A	00.0	-	na	D	No
Shovel Test 2	A	2.0	87		-	No
Shovel Test 3	A	4.0	87		-	No
Shovel Test 4	A	6.0	87		D	No
Shovel Test 5	A	.0	87		D	No
Shovel Test 6	A	10.0	87		D	No
Shovel Test 7	A	12.0	87		-	No
Shovel Test 8	A	14.0	87		-	No

Key: D - Debitage



Map 2-2. Site AT 3B.



Map 2-3. Site AT 5B.

Table 2-5. Radiocarbon Results From Site AT 12B.

FS No.	Location in Site	U. Texas Sample #	Age B.P. (uncorrected)	Age A.D. (corrected[1])		
				max	mid	min.
13	Test Pit 4? surface.[2]	TX-4806	840 ± 60	1040	1155	1275
29	Test Pit 3 Stratum A/B	TX-4804	490 ± 50	1340	1410	1485
34	Test Pit 3 Stratum B	TX-4807	940 ± 50	920	1080	1230
40	Test Pit 2 Stratum A/B	TX-4803	1020 ± 60	870	1030	1185
41	Test Pit 2 Stratum B	TX-4805	1200 ± 80	620	800	980

Notes: 1. Calibrated using the consensus calibration of Klein et al. (1982), with 95% confidence limits.
2. This sample is inconsistent in provenience documentation. It may pertain to the structure (Test Pit 3) or to the downslope ash stain (Test Pit 4).

Surface Description

Examination and collection revealed a sparse (approximately one item per three square meters) scatter of lithics and other items (Map 2-3). Bone, three cores, groundstone, a hammerstone, and a maul were collected from the general surface or from the grid units. Also collected were four sherds from a probable pot drop and with about ten items of debitage, mostly primary and secondary chert and chalcedony flakes. The scatter extended over an area of about 50 by 25 meters, with greatest concentrations within a ten by ten meters area near the datum.

The site was found to extend over a small, low spur ridge having cobbles of chert and chalcedony. Much of the apparent scatter may be composed of quarry-testing debris and naturally broken rock.

Subsurface Testing

Shovel and auger tests along the grid collection transect (Table 2-3) recovered little material, most of which was shallowly buried. Debitage was found in the tests at 0, 4, 8, 16, 18, and 22 meters west of the grid endpoint. A possible core was found in the test at two meters west of the grid endpoint. Other tests produced no reported artifacts. No ash, charcoal, or other materials were reported.

Additional auger tests were carried out elsewhere on the site; these are reported to have recovered occasional flakes from near the surface. The number and location of the additional tests was not recorded. Apparently, artifacts from these additional tests were not collected.

Analyzed Samples

Samples analyzed from AT 5B include a possibly reworked but unidentifiable fragment of bone, shell, tooth, or fossil (Bertram, this volume) and four sherds of Acoma Polychrome pottery, one of which may have been utilized or modified by abrasion. The four sherds appear to represent one modern jar, which is stylistically dated to the Territorial period (Warren and Warren, this volume).

Comments

This site seems to represent a small quarry and retooling locus of undetermined age. The recent Puebloan jar is almost certainly not associated with the lithic items found.

Site AT 6B

Site AT 6B is a small, sparse lithic and ceramic scatter with two concentrations of artifacts. It has been assigned the Laboratory of Anthropology site number LA 33906. The site is located in Township 9N, Range 1W, Section 10, approximately 300 meters south of AT 3B and AT 5B, on the lowest slopes of the Llano de Albuquerque Ceja, at 5315 feet (1620 meters) elevation. The site is set on a slight southwesterly ridge within a cobble-gravel field which contains abundant Santa Fe chalcedonies and other knappable stone. Locally, the soils are sandy, except on the site's two loci, where pebbly, coarser soils are present. The site overlooks the Rio Puerco floodplain. Vegetation is generally sparse, consisting of grasses, snakeweed, rabbitbrush, yucca and cacti.

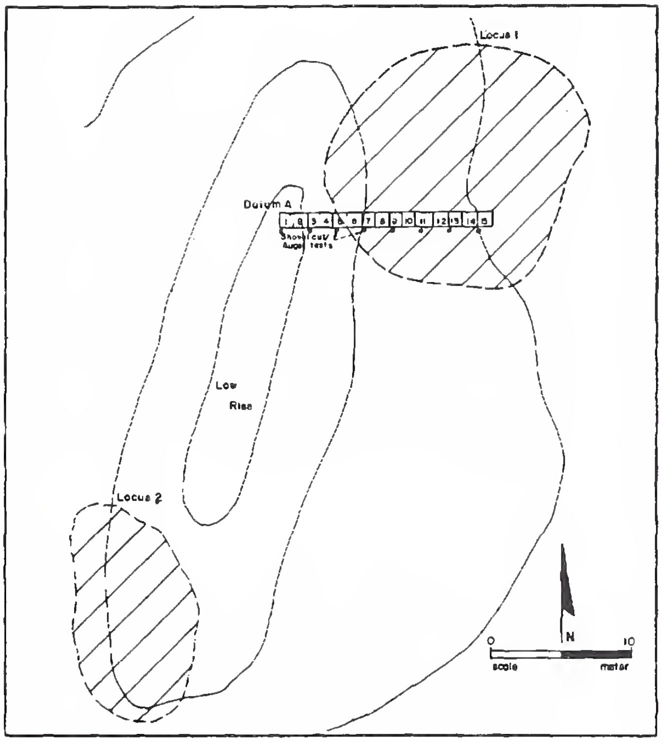
Survey and Testing

No survey records are available for AT 6B. Testing notes mention that the survey collected Socorro B/w and Mancos Corrugated pottery from the site. The site was tested on January 28, 1982. A datum stake was set on the low hummock ridge just west of Locus 1. Testing consisted of relocating and defining the two scatter loci and mapping and collection of formal flaked tools and ceramics from Locus 1. No mapping or collection of artifacts was done within Locus 2; rather, its assemblage was characterized in-field. A 1 by 15 meters collection transect grid, oriented along an east baseline, was laid down across Locus 1 to the east of datum. All surface materials within this grid were collected in one square meter units. Units were numbered starting at datum. Shovel and auger tests were then placed along the south boundary of the transect at two meters intervals (Table 2-4). All fill was screened.

Surface Description

Examination and collection revealed two sparse scatters of lithics and other items (Map 2-4). Several sherds, a scraper, and a rhyolite biface/core were collected from Locus 1, along with about ten flakes. An additional sherd was collected from an area midway between AT 6B and AT 4B to the northeast. The Locus 2 assemblage is reported to have included lithics produced in quarry reduction of local cobbles, together with Socorro B/w and Mancos Corrugated sherds. Locus 1, the richer concentration, was found to extend over an area of about 500 square meters, while Locus 2 covered perhaps 300 square meters in area.

The site was found to consist of two relatively devegetated pebbly knolls connected by a low, sandy, better-vegetated southwesterly ridge. Pebble and cobble deposits



Map 2-4. Site AT 6B.

of chert and chalcedony overlap with the two knolls, which are occupied respectively by Loci 1 and 2. Much of the apparent scatters may be composed of quarry-testing debris and naturally broken rock.

Subsurface Testing

Shovel and auger tests along the grid collection transect (Table 2-4) recovered little material, most of which was shallowly buried. Debitage was found in the tests at 0, 6, 8, and 10 meters east of the datum, for a total of five flakes, all found in the upper ten centimeters of soil. No ash, charcoal, or other materials were reported.

Analyzed Samples

Samples analyzed from AT 6B are limited to 34 sherds (Warren and Warren, this volume), apparently collected in the course of survey as well as testing. They include Socorro B/w (3 jar sherds), Chaco Corrugated (earlier reported as Mancos Corrugated?; 16 jar sherds), Snowflake B/w (1 utilized bowl sherd), Santa Fe B/w (3 bowl sherds), Rio Grande Plain utility (10 jar sherds), and undiagnostic Mineral/white (1 jar sherd). Temper analyses of examples of all but the Rio Grande Plain samples, which were not analyzed, indicate Little Colorado or Rio Salado sources for the decorated wares, including the Santa Fe B/w.

The Chaco Corrugated sherds seem to have been sherd-tempered, an unusual observation for utility wares and possibly incorrect. Several areas along the southern rim of the San Juan Basin (Kin Nizhoni, Guadalupe, Casamero) supported groups who used temper sources composed of sandstone in clay cement. These temper particles consequently fire as "sandstone-tempered sherd temper" (David Hill, personal communication, 1988).

Production dates on the identified ceramics would indicate late Pueblo II through early Pueblo IV occupation, assuming that the site does not have multiple components.

Comments

This site, like the nearby AT 3B, seems to represent an ephemeral multi-purpose location with ceramic affinities outside the area. Unlike AT 3B, but like AT 5B, this site seems to have been occupied cursorily as a casual lithic quarry station.

Site AT 8B

Site AT 8B is a large, discontinuous lithic and ceramic scatter with multiple loci. It has been assigned the Laboratory of Anthropology site number LA 33908. Site AT 8B is located in Township 9N, Range 1E, Section 18, on the upper bajada slope of the Llano de Albuquerque Ceja, overlooking the Rio Puerco valley. The site lies on the southern slope of a semi-stabilized coppice dune ridge, at 5605 feet (1708 meters) elevation. Site AT 11B lies just down the slope to the southwest. Vegetation consists of grasses, yucca, rabbitbrush, snakeweed, and occasional scrub juniper. The site has suffered considerable erosion.

Survey and Testing

The site was described on survey as an aceramic lithic scatter lying in dunes and intervening drainages. It was interpreted as a quarry location for the extraction of chert and silicified wood materials. Cores and large unworked flakes were reported to be abundant.

The site was tested on January 8, 1982. Testing began by relocating and defining the various loci of the site. Four loci and three isolates were defined; however, the three isolates were later reclassified as loci. The site was then mapped, and judgmental collections made in three of the four original loci. The isolates were plotted and totally collected. Shovel and auger tests were placed in each locus.

Surface Description

The site lies along the southern crest and down the southern slope of a west-trending coppice dune about ten meters high. Artifacts are concentrated in four loci extending about 370 meters along the upper southern slope of the dune (Map 2-5). These loci were numbered, from west to east, as Loci 1-4, respectively. Three isolated scatters of lithics and/or sherds were found down the slope to the south; these were later numbered as Loci 5-7.

Locus 1 contained about ten chalcedony non-tertiary flakes and shatter within an area 15 meters in diameter. No surface artifacts were collected. Locus 2 consisted of a light scatter of tested chalcedony cobbles and testing reduction debris (about 30 pieces) scattered over a 10 by 20 meters area. Six flakes were collected. Locus 3 consisted of a 20 by 40 meters scatter of metate fragments, sherds, tested cobbles, quarry and tertiary debitage, and burned rock. A groundstone fragment, six lithics, and two sherds were collected. Locus 4 was a blowout, about 25 meters in diameter, containing tested cobbles, sherds, and about 25 flakes (quarry reduction, non-tertiary). Four sherds and four lithic items were collected. Collections from the three isolate-loci netted three sherds and four lithic items.

Subsurface Testing

Shovel and auger testing was carried out on Loci 2, 3, 4, and 7. Field notes and preliminary summary data indicate that a series of tests (perhaps 15 in all) were dug on Locus 1; all were negative. The locus is underlain by unconsolidated sand.

On Locus 2, several tests were placed in and upslope from the locus; all indicated only loose surface sand. A test within the locus produced a burned rock fragment. A test a few meters upslope from the locus yielded a large core fragment, at 15 centimeters depth, which was apparently not collected.

On Locus 3, the summary indicates that 20 tests were dug, but the field notes indicate that only two tests were made. Only those tests described in the field notes will be discussed. The first, at the elevation of the locus but placed to one side, encountered a hard subsoil at ten centimeters depth. This soil continued to below 25 centimeters depth. The second, upslope from the locus, encountered nothing but loose sand and was closed at 30 centimeters depth.

On Locus 4, field notes indicate three tests were made. No artifacts were found. A hard substrate was encountered five centimeters below the blowout surface. In Locus 7, one or more tests found no subsurface remains. No tests are reported to have found ash or charcoal stains.

Analyzed Samples

Only ceramics were collected and analyzed from this site (Warren and Warren, this volume). They included Lino Polished Gray (2 jar sherds), Los Lunas Smudged (1 bowl sherd), Corona Corrugated (5 jar sherds), and an unidentified Mineral/white ware (1 sherd). The Lino was probably produced in the Rio Salado area. The Los Lunas seems to be a typical west-central New Mexico material. The Corona material seems to have been made in the Manzanos, with Coyote Canyon and Tijeras Canyon sources both implied. Excluding the Lino (from Locus 6), all other materials are consistent with a late Pueblo III through middle Pueblo IV date for a single occupation of Loci 3 and 4.

Comments

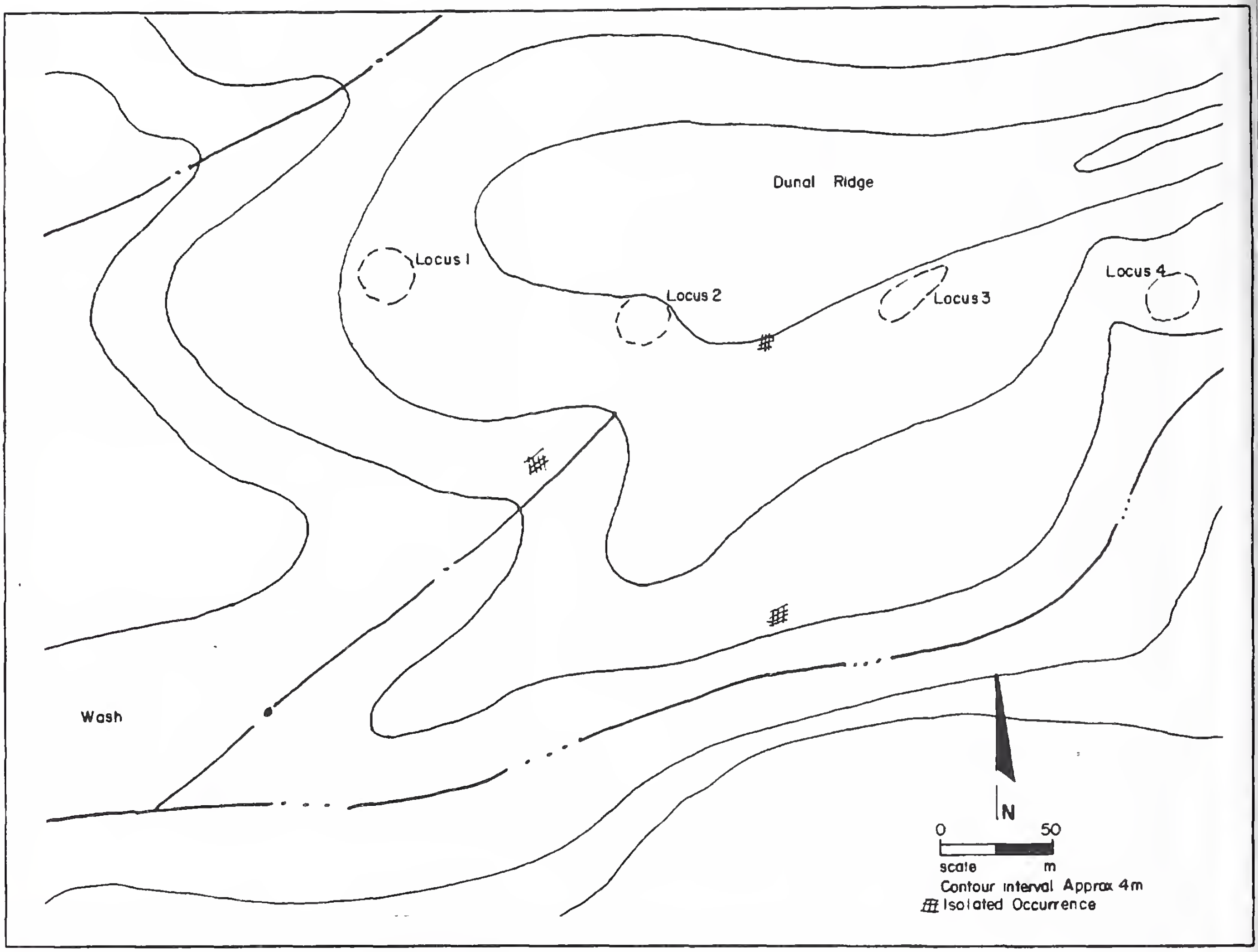
This large site probably has little or no interlocus integrity. It represents, most likely, the remains of a series of short term quarrying or camp or processing occupations, at least some of which occurred in Basketmaker III/Pueblo I times, and others of which occurred in Pueblo III/Pueblo IV times. Probably the presence of the four evenly-spaced major loci is epiphenomenal, reflecting differential erosion and exposure of artifacts along the ridge.

Site AT 9B

Site AT 9B is a dispersed lithic scatter with two loci of more concentrated debris. It was assigned the Laboratory of Anthropology number LA 33909. The site is located in Township 9N, Range 1E, Section 18, on a coppice dune capping a westerly-trending ridge, on the upper middle slopes of the Llano de Albuquerque Ceja at 5670 feet (1728 meters) elevation. Sites AT 8B, AT 10B, AT 12B, and AT 35C are located within a few hundred meters. The site is vegetated by snakeweed, rabbitbrush, grasses, and occasional juniper in sheltered locations. The site is exposed primarily in blowouts.

Survey and Testing

The site was described on survey as a lithic scatter, composed primarily of thousands of items of chert quarrying debris. It was reported as extending over about 100,000 square meters of area, with several concentration loci. The site was tested on January 12, 1982. Testing procedures consisted of relocation, pinflagging of artifacts, and compass-and-pace map-



Map 2-5. Site AT 8B. There are four loci of artifact concentrations.

ping of concentrations. A small, judgmental sample of artifacts was then collected from each of the two loci defined. Finally, a series of shovel and auger tests was placed within each locus.

Surface Description

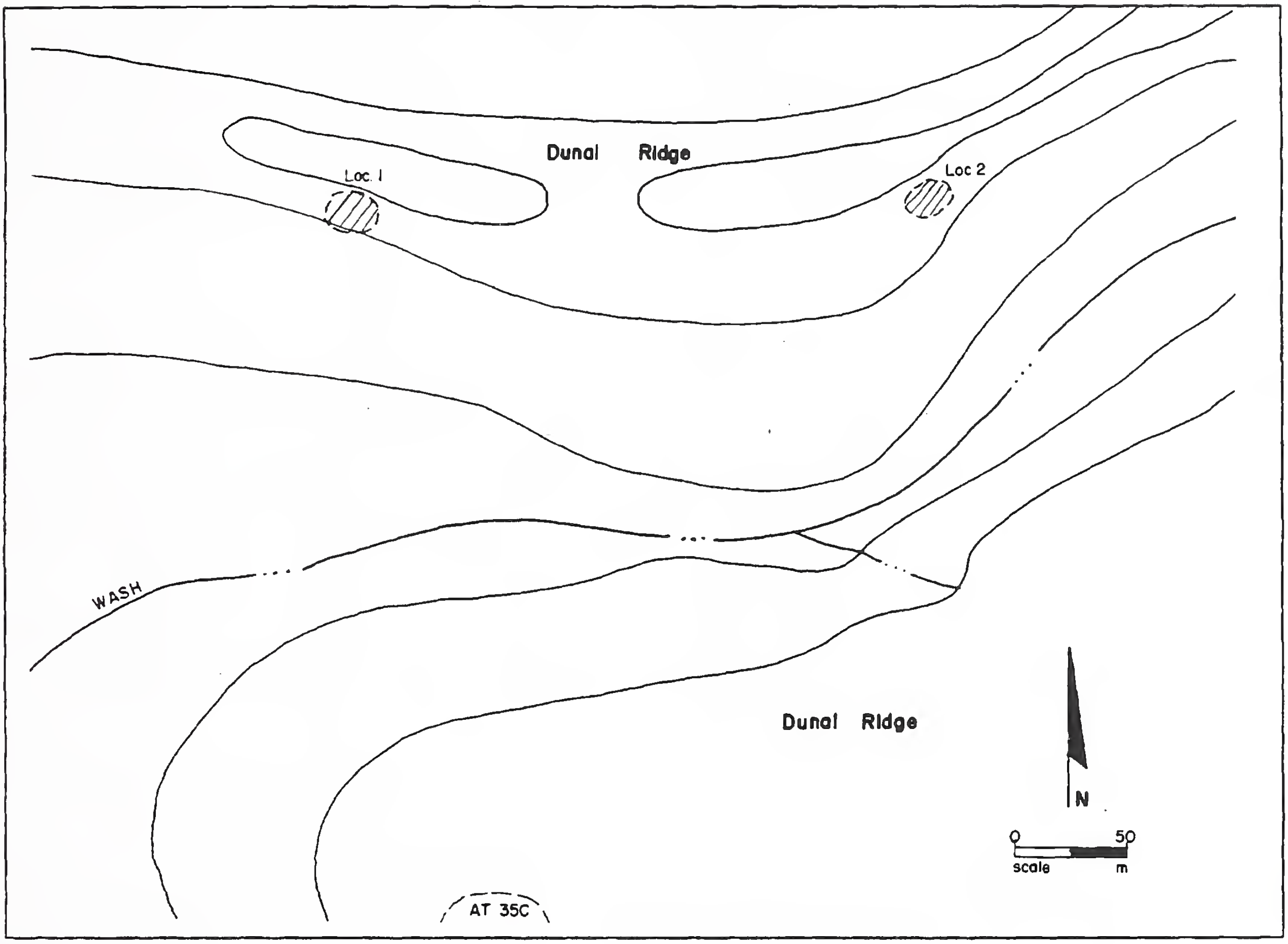
Surface examination (Map 2-6) revealed a sparse scatter of lithic artifacts scattered over an undetermined but very large area of dune ridges and intervening arroyos. Artifacts were found to be concentrated primarily within two blowouts. The westernmost of these was designated Locus 1 and the easternmost, about 250 meters away, was designated as Locus 2.

Locus 1 was composed of three chalcedony cores and over 40 primary and secondary flakes and angular debris, scattered over a roughly circular blowout 20 meters in diameter. The artifacts appeared to be eroding from a horizon 40 centimeters below the dune crest. Two or three cores and 16 to 19 flakes were collected.

Locus 2 was composed of 24 primary and secondary debitage pieces and two cores, all of chalcedony, scattered over a roughly circular blowout nine meters in diameter. Both cores and 10 to 12 flakes were collected. The source horizon for the artifacts was not apparent.

Samples Analyzed

No samples were analyzed for this site.



Map 2-6. Site AT 9B, a sparse lithic scatter.

Subsurface Description

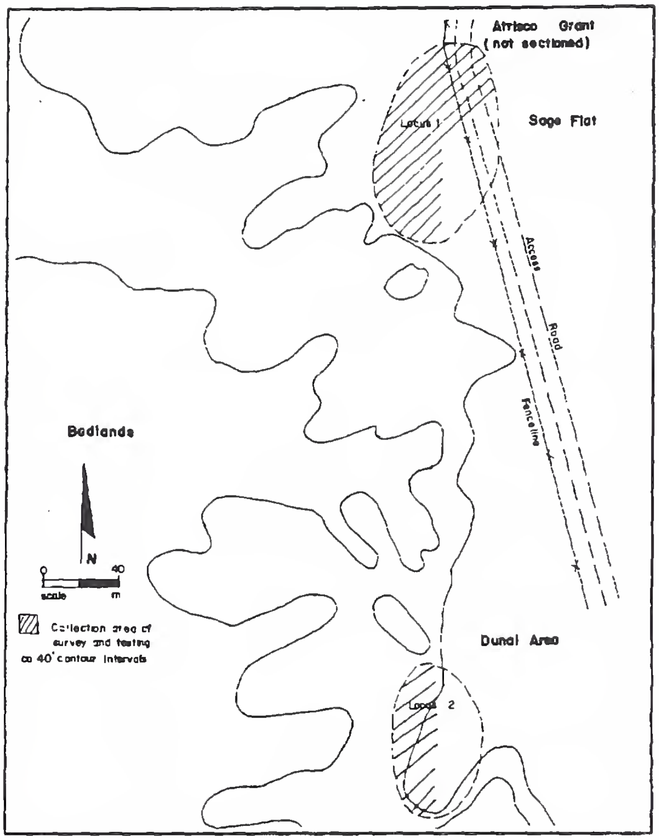
A series of shovel and auger tests were dug immediately north of the blowout forming Locus 1. The tests were excavated to 50 centimeters depth, at which point a consolidated horizon was encountered. All tests were sterile. Locus 2 was tested in the same manner as Locus 1; all tests were sterile. No data on test hole stratigraphy were recorded.

Comments

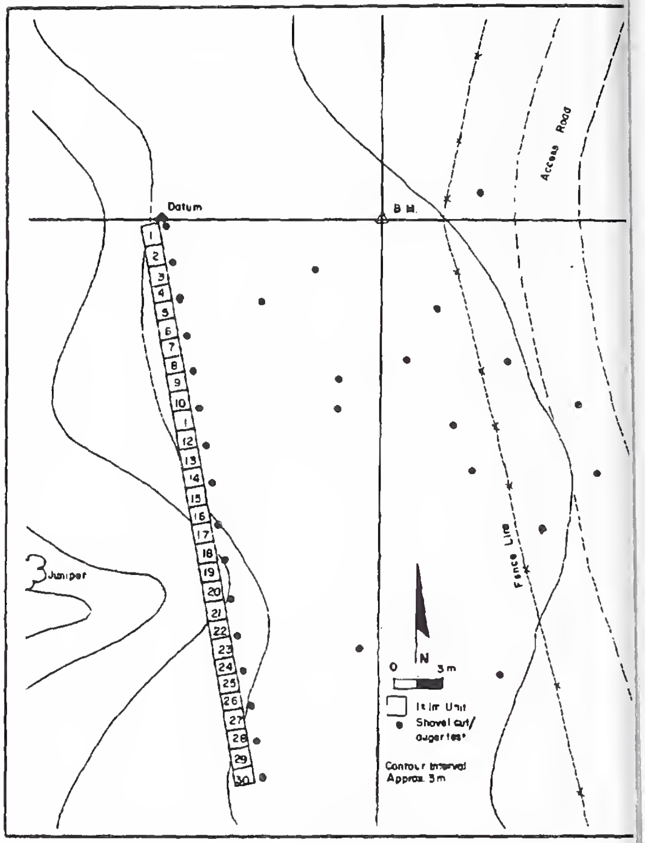
The investigators' field impressions were that these two loci represented the debris of initial reduction episodes, using locally available cobbles. They further suggested that the remaining debitage seemed to be dominated by unusable angular fragments, indicating that flakes of usable forms had been selected and removed.

Site AT 10B

Site AT 10B is a lithic scatter with at least one associated sherd. It was assigned the Laboratory of Anthropology site number LA 33910. The site is located several hundred meters east of AT 9B, in Township 9N, Range 1E, Section 18. The site is set on the crest of the Llano de Albuquerque Ceja, overlooking the Rio Puerco valley to the west, at 5760 feet (1756 meters) elevation. Because the site is heavily dissected and deflated, it is likely that many artifacts have been displaced by wind and water movement. The sparse vegetation is dominated by snakeweed and grasses. The site may extend to the east on the sage/grass steppe of the mesa.



Map 2-7a. Site AT 10B.



Map 2-7b. Testing in Locus 1 of Site AT 10B.

Survey and Testing

The site was described on survey as a lithic scatter, composed primarily of thousands of items of chert, silicified wood, and quartzite quarrying debris. Also reported were a B/w sherd, a hammerstone, and one or more pieces of groundstone. The site was reported as extending over about 10,000 square meters of area, with several concentration loci. It was the opinion of the testing crew that continuity of scatter probably existed between AT 10B and other nearby sites to the south and west.

The site was tested on January 11 and 12, 1982. Testing procedures consisted of relocation, pinflagging of artifacts, and transit and stadia mapping of concentrations, augmented by compass-and-pace mapping. A small, judgmental sample of artifacts was then collected from each of the two loci defined. A transect of three by three feet (.9 by .9 meters) collection grids 100 feet (30.48 meters) in length was laid out across Locus 1 and totally collected. Finally, a series of shovel and auger tests were placed along the collection transect. Additional shovel and auger tests were placed at random across Locus 1 (Maps 2-7a and 2-7b).

Surface Description

Surface examination revealed a sparse scatter of lith artifacts distributed over an undetermined but ver large area of mesa edge flats, steep erosional ridges, an intervening arroyos. Artifacts were found to be concer trated primarily within two loci. The northernmost these was designated Locus 1 and the southernmos about 225 meters away along the Ceja crest, was desig nated as Locus 2.

Locus 1 was composed of an extensive scatter, lyin mostly outside the survey area. It contained teste cobbles, cobble cores, occasional utilized flakes, pri mary and secondary debitage, and a few hammerstones choppers, and pieces of groundstone. This debris wa estimated to extend over at least 5,000 square meters o area. The artifacts appeared to be eroding from th surface and washing down the steep slopes to the west Twelve lithics were judgmentally collected. A grid collec tion transect was then laid out to the south of the Locu 1 datum; nine flakes, one core, and one hammerston were collected.

Locus 2 was described as similar to Locus 1 in setting and contents. It lay almost completely outside the survey area, so it was not tested or mapped in any detail. Two sublocal concentrations of artifacts were noted; hearths were reported to the southeast, outside the locus. A tool was collected either from Locus 2 or from the eroded area 100 meters west of and downslope of the locus. The summary and the field catalog are in conflict on this point.

Subsurface Testing

A transect series of shovel and auger tests was dug immediately to the east of the grid collection transect across Locus 1. These tests were spaced every six feet. Tests were taken to a depth of 30 centimeters; all were sterile. Additional tests were placed at random across the locus area. These produced a few flakes, from just below the surface, which were apparently not collected. Locus 2 was not tested.

Samples Analyzed

No samples were analyzed for this site. A single sherd of B/w pottery was reported on survey but not relocated in testing.

Comments

The investigators' field impressions were that these two loci represented the debris of initial reduction episodes, using locally available cobbles.

Site AT 11B

Site AT 11B is a lithic scatter with at least a few associated sherds. It was assigned the Laboratory of Anthropology site number LA 33911. The site is located between AT 8B and the western end of AT 12B, in Township 9N, Range 1E, Section 18. The site is set on the slopes of the Llano de Albuquerque Ceja bajada, overlooking the Rio Puerco valley to the west, at 5605 feet (1708 meters) elevation. It is set on a coppice dune atop a heavily dissected ridge. It is possible that some artifacts have been displaced by wind and water movement. The sporadic vegetation is dominated by snakeweed, yucca, and grasses. A few juniper bushes grow in sheltered locations.

Survey and Testing

The site was described on survey as a ceramic and lithic scatter, composed primarily of a core, flake, and several sherds of Socorro B/w and smudged brownware. It was reported as extending over about 250 square meters of area. The site was tested on December 22 and 23, 1981. Testing procedures consisted of relocation, pinflagging of artifacts, and compass-and-pace mapping of the two concentrations found. A total collection of surface artifacts was taken from each of the two loci defined. Two trenches were dug along the dune crest between the two loci. Random auger tests were dug (Map 2-8). The fill was screened.

Surface Description

Surface examination revealed a sparse scatter of lithic artifacts distributed over about 6,000 square meters of area, with two concentrations. Each concentration (labeled from west to east as Loci 1 and 2, respectively) covered only a few square meters of blowout; they were about five meters apart. The site lay on a coppice dune, with materials visible primarily in blowouts.

Locus 1 was composed of 14 collected pieces of chipped stone, including two or more cores. Locus 2 was composed of eight collected pieces of debitage. The presence of other items was noted on the surface in the areas around and between the two loci. All lithics were cores or angular debris and secondary flakes of chalcedony, chert, and silicified wood.

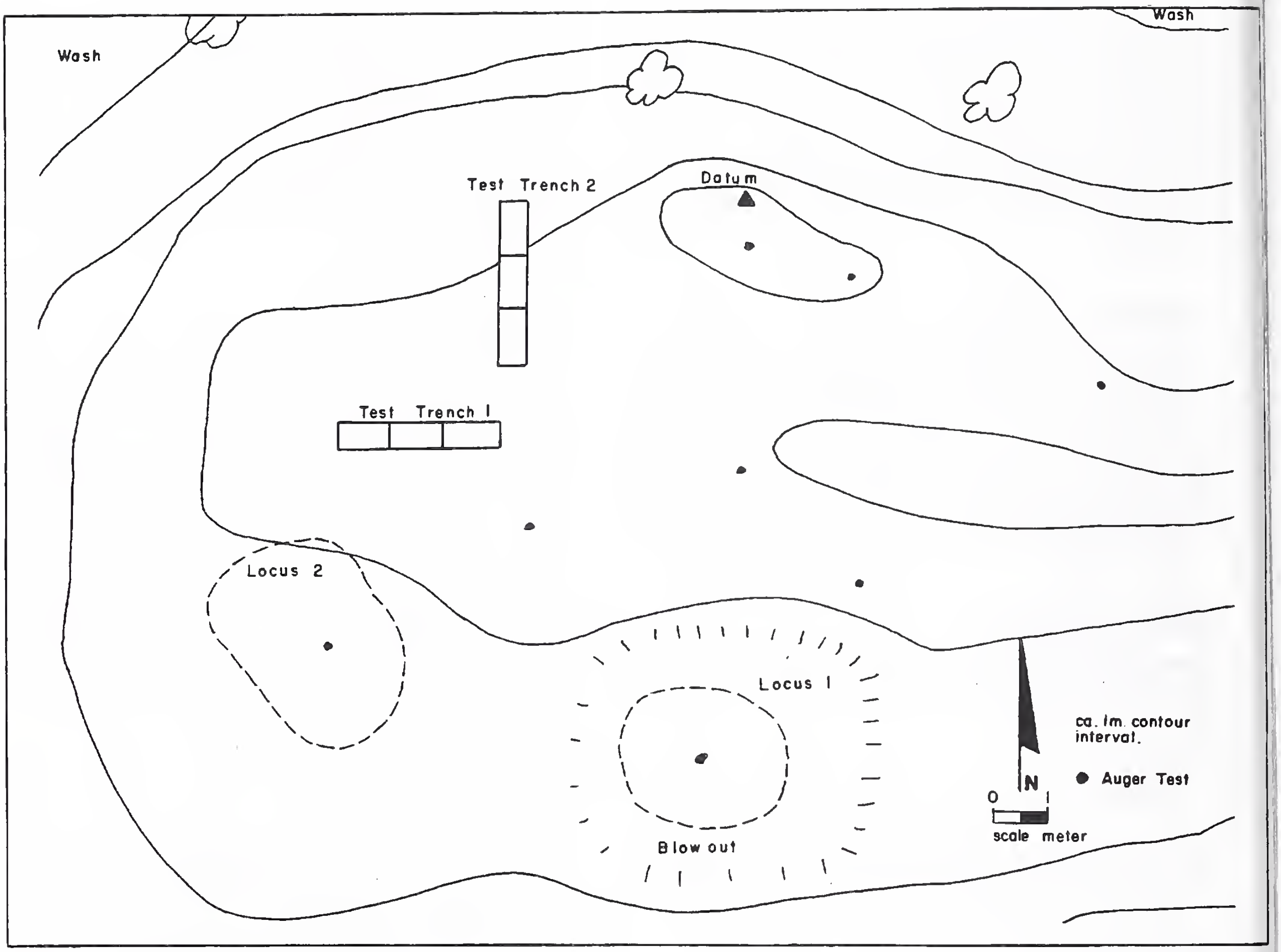
Subsurface Testing

The site was tested by placing at least eight auger tests randomly in Loci 1 and 2 and upslope to the north. No artifacts were encountered. Two formal test trenches, each 0.5 by 3 meters in size and numbered as Trenches 1 and 2, were placed between datum and Locus 2. The two trenches were oriented respectively along magnetic east-west and magnetic north-south.

Trench 1 (Fig. 2-2) was excavated to depths of up to 93 centimeters below surface. Two or more items of debitage were recovered and collected. The bottom level of the trench was extended by augering, but no more materials were found. Stratigraphy was alternating sand and fine gravel.

Trench 2 (Fig. 2-3) was excavated to depths of up to 90 centimeters below the surface. Only mixed sand and gravel were encountered. Two or more items of debitage were recovered. Again, the bottom of the test was extended by augering, but no more cultural items were recovered.

Field notes, log sheets, and the summary are in conflict regarding the number of subsurface artifacts recovered. The indicate a total count, respectively, of 4 or 5, 7, and 13 items excavated and collected.



Map 2-8. Site AT 11B test locations.

Samples Analyzed

Only survey-collected ceramics were analyzed for this site. No ceramics were found in testing. The ceramics analyzed (Warren and Warren, this volume) indicate that a Socorro B/w bowl (eight sherds, refit) was broken on the site. Also present was one or more jars of plain brownware, scoria tempered. Both types indicate west-central New Mexico manufacture, probably in the late Pueblo II to early Pueblo IV period.

Comments

The investigators' field impressions were that this site represented the debris of initial reduction episodes, using locally available cobbles. No information was recovered inconsistent with the survey's estimated date of A.D. 1150 to 1350, based on Socorro B/w ceramics.

Site AT 12B

Site AT 12B is an extensive lithic scatter having at least one structural locus with associated ceramics. It was assigned the Laboratory of Anthropology site number LA 33912. The site is located just to the south of sites AT 9B, AT 11B, and AT 35C, in Township 9N, Range 1E, Section 18. The site is set on the uppermost bench slopes of the Llano de Albuquerque Ceja bajada, overlooking the Rio Puerco valley to the west, at 5600 feet (1706 meters) elevation. The site extends along a coppice dune atop a heavily dissected westerly-trending ridge for approximately 850 meters. It is possible that some artifacts have been displaced by wind and water movement. The sporadic vegetation is dominated by yucca and grasses. A few juniper bushes grow in sheltered locations.

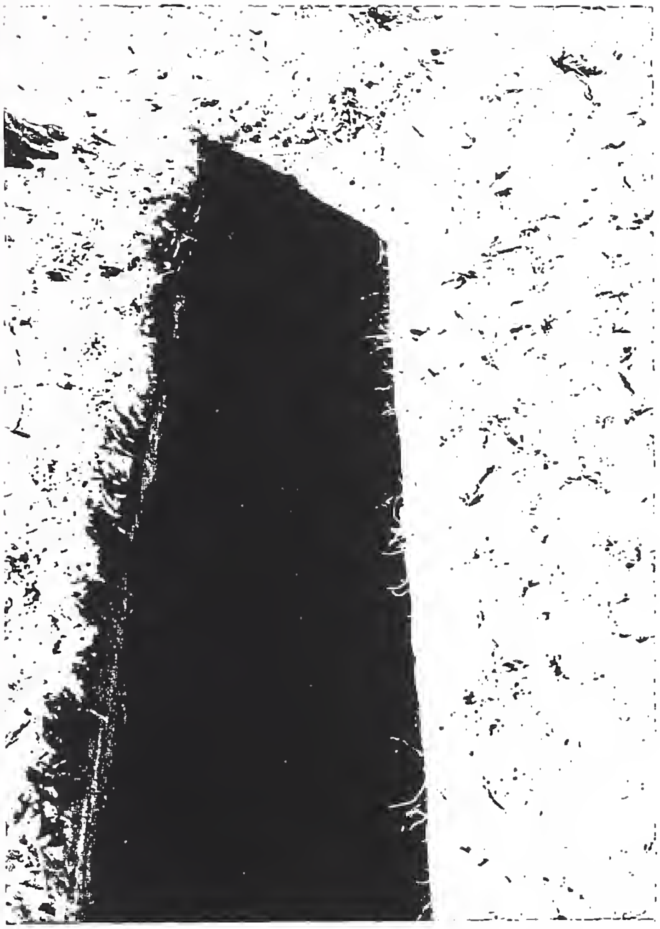


Figure 2-2. Site AT 11B, Trench 1 from the East.

Figure 2-3. Site AT 11B. Trench 2 viewed from South.

Survey and Testing

The site was described on survey as a lithic scatter, composed primarily of chert and silicified wood quarry debris, cores, and unworked cobbles. The site was reported as extending over about 220,000 square meters of area. It was tested on January 12 - 15, 1982. Testing procedures consisted of relocation, pinflagging of artifacts, and compass-and-pace mapping of the single concentration (Locus 1) found. A total collection of surface formal artifacts was mapped and taken from Locus 1. A series of 16 auger tests were placed along an east-west and a north-south transect, spaced at one meter intervals. A one by three meters test trench (Test Pits 1-3) was dug across the locus. An additional 0.5 by one meter test pit was dug on the slope at the south edge of the locus (Maps 2-9a and 2-9b). The fill was screened.

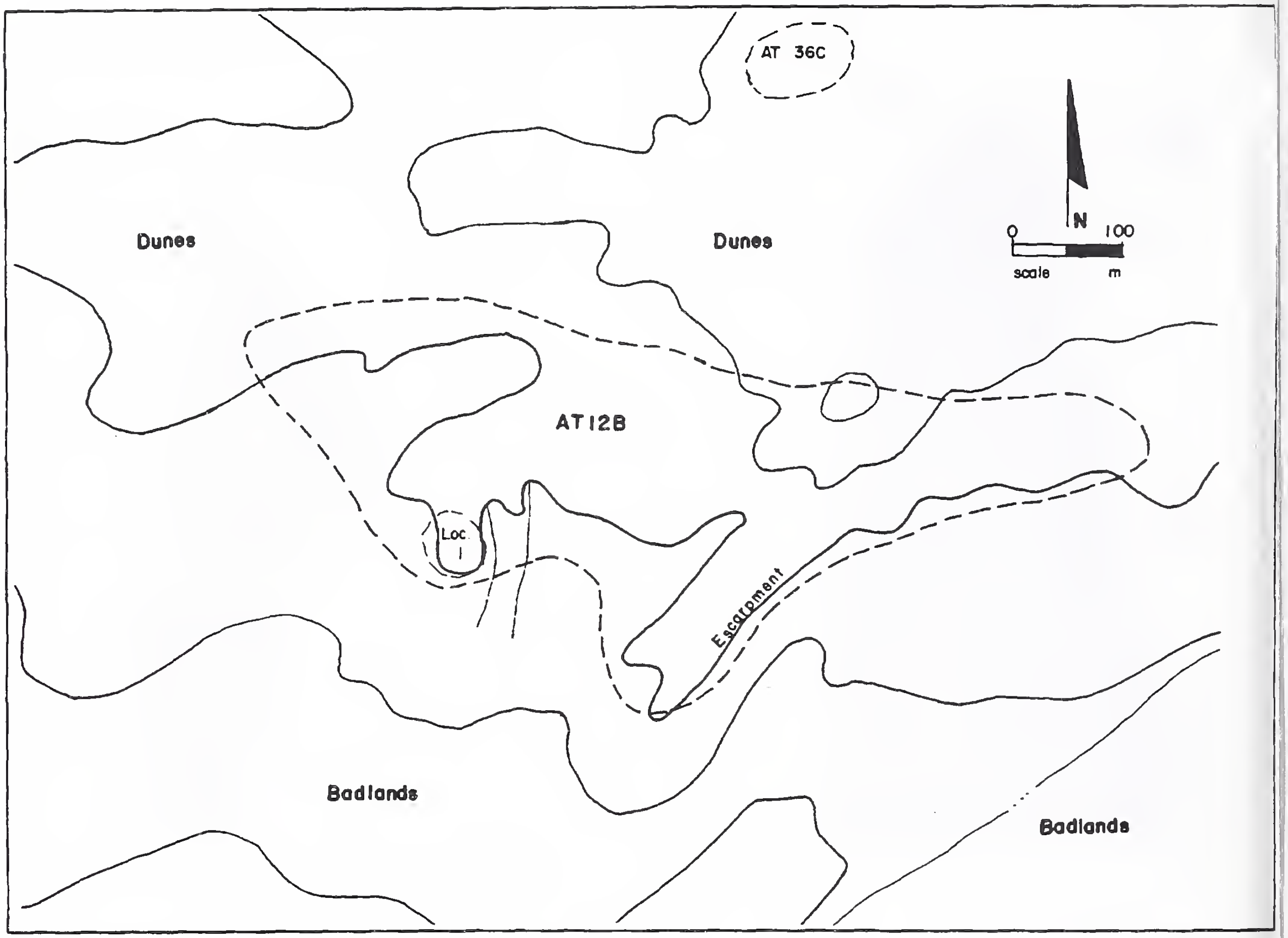
Surface Description

Surface examination of the entire site revealed a sparse scatter of tested cobbles and primary flakes distributed over about 85,000 square meters of ridge-top dune. There is a single concentration of artifacts (Locus 1) which also included sherds and groundstone.

The surface assemblage of Locus 1 was composed of a biface, two cores, at least four pieces of groundstone, an unspecified lithic tool, a polishing stone, nine or more flakes, nine sherds, bone, and charcoal. The presence of additional flakes was noted on the surface in the areas around the locus.

Subsurface Testing

The site was tested by placing 16 auger tests along two perpendicular transects in Locus 1. One auger test, just south of datum, produced subsurface artifacts and charcoal. In order to explore this finding further, three adjacent one by one meter test pits (Test Pits 1-3) were opened in the area one to two meters south of datum; the trench extended from two meters west of datum to one meter east of datum. An additional test pit (Pit 4) was



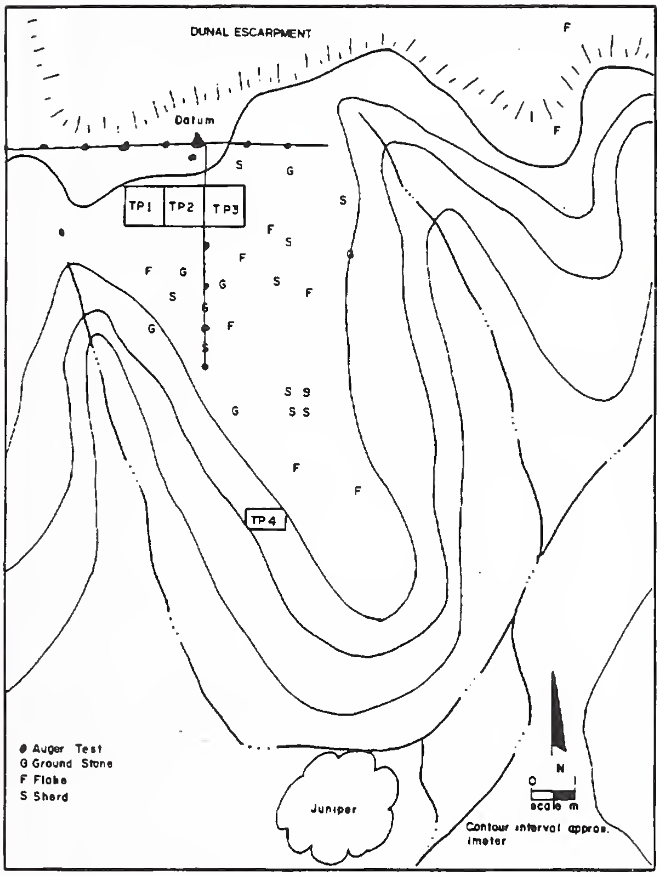
Map 2-9 a . Site AT 12B surrounded by dunes and badlands.

excavated ten meters to the south and one meter to the east of datum to investigate a surficial charcoal stain.

Test Pits 1-3 (Figs. 2-4, 2-5) were excavated to depths of 60 centimeters below surface. Structural remains, including roof fall, wall fall, interior artifacts, and trash were encountered lying on a floor or use surface with at least one post hole. These remains were found in a dense cultural stratum (Stratum B) beginning just below the surface (Stratum A) and ending at up to 60 centimeters below surface on a sterile, pebbly, compact sand (Stratum C). It appeared that the edge of a structure had been encountered, suggesting that the structure remained intact and buried upslope to the north.

Recovered from Test Pits 1-3 were samples of building material, bone, soil, wood, charcoal, juniper bark, flakes, a collected core and groundstone with red pigment. There was also a piece of groundstone collected for pollen wash recovery.

Test Pit 4 was excavated to a depth of 30 centimeters below surface. The tested charcoal stain proved to be present as a 30 by 40 centimeters area extending only one to five centimeters into the fill. Beneath the charcoal stain was found the same sterile sand with pebbly and clay inclusions identified as substrate Stratum C in Test Pits 1-3. A flotation sample and four flakes were collected from the stained area and the upper few centimeters of the fill. Auger tests to an additional 50 centimeters depth indicated continuation of Stratum C. The stain was judged to represent eroded midden or an eroded hearth remnant, probably associated with the structural feature and fill encountered just upslope in Test Pits 1-3.



Map 2-9 b. Site AT 12B, testing in Locus 1.

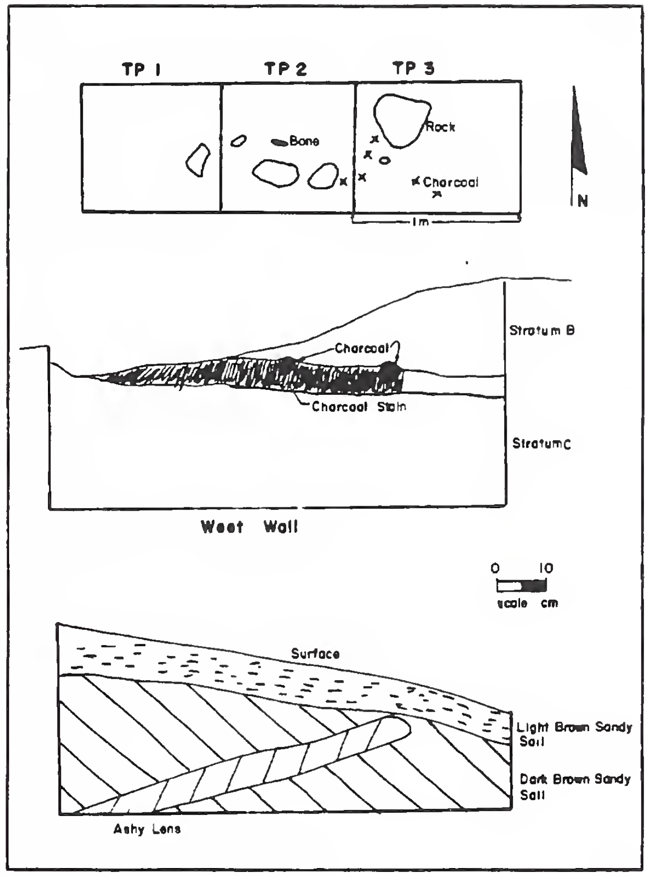


Figure 2-5. Site AT 12B, Test Pits 1 to 3.

Figure 2-4. Site AT 12B, Locus 1, Test Pit 2.

Samples Analyzed

Samples analyzed from this site included bone, 11 sherds, four radiocarbon samples, and a pollen wash from a sample of groundstone, all from the structural fill of Test Pits 1-3. A charcoal sample, FS #13, apparently drawn from the surface ash of the Test Pit 4 hearth but recorded inconsistently as being from the surface of Test Pit 3, seems to have been submitted as an additional radiocarbon sample. A pollen pinch from the modern surface was analyzed as a control.

The radiocarbon samples were submitted to the University of Texas at Austin for analysis. The results are summarized in Table 2-5 [see page 17]. The dates seem to indicate an earlier occupation during Pueblo II times, underlying and intermixed with the Pueblo IV occupation implied by the ceramics.

Ceramics (Warren and Warren, this volume) included only Pueblo IV wares: San Clemente G-p (two bowl sherds), Cieneguilla G/y (one bowl sherd), unidentified G-p (two bowl and one jar sherds), unidentified glazeware (one red and one pink jar sherd), and unidentified (three jar sherds). Temper studies on the identified glazewares indicate source areas were Tonque (LA 240) and the Cochiti area. All the ceramics studied are most consistent with an estimated date of about A.D. 1400.

Pollen (Scott, this volume) was recovered by washing from a metate fragment found at the base of Stratum B in Test Pit 2. Also analyzed was a surface pinch pollen. The metate sample was higher in chenopod/amaranth pollen than was the surface sample. Also noted in the metate sample were cattail, maize, high-spine composites, prickly pear, hackberry, members of the *Solanaceae* family, and unusually abundant legume pollen of an unidentified form different from those in the surface pinch. The analyst suggested that a variety of plants may have been processed, presumably within a short period of time or in one event.

Bone (Bertram, this volume) was recovered from the surface and from the buried Stratum B burned structural remains in Test Pits 1-3. The surface sample was limited to a domestic sheep radius, from a large lamb. This item had been exposed on the surface for some time prior to recovery. About 50 bones were recovered from Stratum B. Taxa represented were jackrabbit (one adult), cottontail (one adult), wood rat (one adult), and Ord's kangaroo rat (one adult). All taxa had been processed or disposed of by burning, at least in part. A jackrabbit limb fragment seemed to be fecal, but whether the feces was human or canid could not be determined. Preservation was highly variable. Most body parts were present for the rabbits and wood rat, but foot and skull parts were most common overall.

It appears that no macrobotanical or dendrochronological samples were submitted.

Comments

This site seems to consist of a very large lithic scatter overlain by a small occupational site, which may itself have had multiple components. Insufficient data are available to determine the nature of the structure or structures encountered in Test Pits 1-3, but a range of wild foods, as well as maize, seem to have been processed by the occupants. It is likely that the primary occupation of the structure occurred in Pueblo IV times, but one or more earlier Puebloan occupations may be indicated by the radiocarbon date suite.

Site AT 6C

Site AT 6C is a sherd and lithic scatter with burned rock scatters or hearths. It has been assigned the Laboratory of Anthropology site number LA 33918. The site is located in Township 9N, Range 1W, Section 14, on a ridge of the lower bajada of the Llano de Albuquerque Ceja. The site is exposed within blowouts on the upper southern slope of a westerly-trending ridge-top dune. At an elevation of 5425 feet (1653 meters), the site commands an overview of the Rio Puerco valley. Nearby are sites AT 4C, AT 5C, AT 7C, and AT 8C, all within a few hundred meters. The site is poorly vegetated with grasses (grama, ricegrass, dropseed), snakeweed, rabbitbrush, yucca, saltbush, and occasional yucca.

Survey and Testing

The site was described on survey as a lithic and ceramic scatter with groundstone and two hearths or burned rock scatters. The central area of the site was judged to extend over 22 meters of ridge-top dune, with primary concentrations in blowouts at the eastern and western ends. Ceramic associations indicated a Pueblo III age. Two manos and several flakes were collected from unspecified locations. It seems that sherds were also collected; about 20 more sherds are described in specialists' reports than were reported as collected in the testing phase.

The site was tested on December 4, 7, and 8, 1981. Testing began with relocation of artifacts and compass-and-pace mapping of the two concentrations (Locus 1 and Locus 2) found. Two datum points (Datum A and Datum B) were established on the edges of the western and eastern loci, respectively. A total collection of surface artifacts was mapped and taken from both loci. No shovel and auger tests were dug. Two test pits (Map

2-10) were dug. The first (Test Pit 1) was centered in the western blowout; the second (Test Pit 2) was placed on the dune crest between the two datum points. Fill was screened.

Surface Description

Surface examination revealed a scatter of lithic and ceramic items extending over an oval area of about 20 meters by 40 meters, with burned rock present at the western blowout, Locus 1 (Map 2-10). Artifacts collected included 13 sherds, ten flakes, two cores, and a hammerstone from Locus 1; two groundstone items, five flakes, and nine sherds were collected from Locus 2. Ceramics included Socorro B/w and Pilares Banded from both loci. Debitage represented all reduction stages. Artifacts were mainly visible in blowouts, although a few items occurred along the less-eroded dune slope and crest.

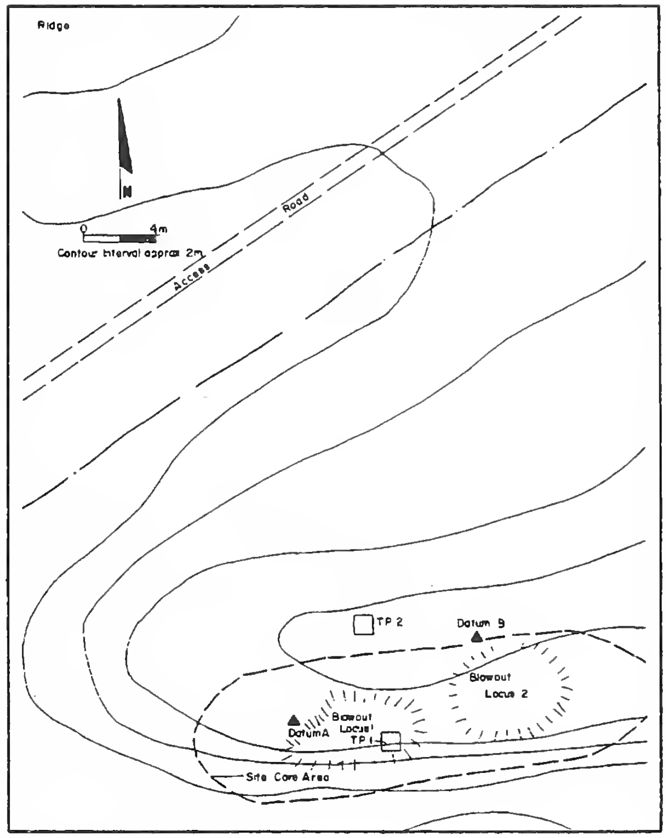
Subsurface Testing

No shovel or auger tests were dug on this site. Two test pits, both of one by one meter size, were excavated. Test Pit 1, located in the center of Locus 1, was excavated to 80 centimeters depth in 10-30 centimeters arbitrary levels. Test Pit 2, located on the ridge crest between and north of the two loci, was excavated to 60 centimeters depth in arbitrary levels of ten centimeters. In neither test pit were ash, charcoal or marked soil contacts found; rather, the stratigraphy seems to have been intergrading sands and pebbly loams in both locations.

Artifacts were found in both tests. In Test 1, two flakes were found at 0 to 30 centimeters depth; three sherds were found at 30 to 40 centimeters depth; and a flake and a sherd were found at 60 to 70 centimeters depth, associated with a rodent burrow. In Test Pit 2, four flakes and two sherds were found at 10 to 20 centimeters depth; five flakes, a sherd, and a rifle cartridge were found at 20 to 30 centimeters depth; five flakes, three sherds, and a "red-dog" shale bead or pendant were found at 30 to 40 centimeters depth; and two small flakes were found at 40 to 50 centimeters depth. No other collections were made.

Samples Analyzed

No samples other than a collection of 59 sherds were analyzed from this site. The ceramics (Warren and Warren, this volume) display no apparent distributional pattern of age or type differences between loci, or between surface and subsurface collections. Decorated



Map 2-10. Site AT 6C.

wares included late Kiatuthlanna B/w (one jar sherd), Cebolleta B/w (one jar sherd), Socorro B/w (two bowl and 12 jar sherds), and undiagnostic Mineral/w (seven bowl and six jar sherds). Utility (unpainted or tooled) wares included Pilares Banded (ten jar sherds), Los Lunas Smudged (three bowl sherds), late Chaco Corrugated (one jar sherd), brownware (eight jar sherds), and other plainware (eight jar sherds). With one exception, these types are all characteristic of late Pueblo II, Pueblo II/Pueblo III, and Pueblo III assemblages. The exception, Los Lunas Smudged, is a rather undiagnostic type whose use extends well into middle Pueblo IV times. Temper analysis of 15 sherds indicates all were probably made in the general Rio Puerco/Rio Salado area.

Comments

If this site is single-component, it dates to the early Pueblo III period; if not, it represents a series of late Pueblo II through Pueblo III occupations. In either case, it appears to represent a temporary gathering camp with lithic reduction and food acquisition and food processing as primary activities.

Site AT 8C

Site AT 8C is a lithic scatter with burned rock areas. It was assigned the Laboratory of Anthropology site number LA 33920. The site is located in Township 9N, Range 1W, Section 14, on the bajada slopes of the Llano de Albuquerque Ceja. The site is set at 5435 feet (1656 meters) elevation on a dune capping an erosional ridge of the bajada. The dune is eroded; most items were found in blowout settings. Vegetation is fairly sparse and is dominated by grasses, snakeweed, rabbitbrush, and yucca. A few junipers stand near the site. Site AT 6C lies a short distance to the northwest.

Survey and Testing

The site was described on survey as a tiny (7 square meters) lithic scatter on a natural outcrop of knappable cobbles. Three flakes were collected. The site was tested on December 4 and 7, 1981. Testing began with location of artifacts and compass-and-pace mapping of the concentration found. Either one or two datum points were established on the edge of the concentration. A total collection of surface artifacts was mapped and collected. No shovel or auger tests were dug. Two test pits (Map 2-11) were dug. Both seem to have been placed upslope from the concentration. The fill below each completed test pit was augered. Fill was screened.

Surface Description

Surface examination revealed a scatter of lithic items extending over about 500 square meters of area. This description is inconsistent with the survey characterization. Burned rock was noted as present. Artifacts collected included 19 flakes, three cores, five possible cores or tested cobbles, four "lithic objects" (angular fragments?), two angular fragments, a possible piece of groundstone, and two pieces of burned rock. One or two manos may also have been collected. Debitage represented all reduction stages. Several items may have been utilized. Artifacts were mainly visible in blowouts, although a few items occurred along the less-eroded dune slope and crest.

Subsurface Testing

No shovel and auger tests were dug on this site. Two test pits, both of one by one meter size, were excavated. Test Pit 1 was excavated to 40 centimeters depth in ten centimeters arbitrary levels; the northwest quadrant was then dug another 20 centimeters down (Fig. 2-6). Test Pit 2 was excavated to 50 centimeters depth in ten centimeters arbitrary levels. Auger testing may have been done within the completed test pit.

In Test Pit 1, a burned possible artifact was found in the first level and two lithic items were found in each of the next three levels. In Test Pit 2, a few bits of charcoal and two small flakes were found in the upper ten centimeters of fill; the pit was thereafter sterile. The stratigraphy in both pits seems to have been a sequence of intergrading sands and pebbly loams; alternating harder and softer layers a few centimeters thick were reported from Test Pit 1.

Samples Analyzed

No samples were analyzed from this site.

Comments

This site appears to have been a lithic processing site with, perhaps, minimal other extractive or processing activities associated.

Author's Note

The inconsistencies in the documentation of this site make it difficult to assess its character and significance. The location of test pits, the number of datums established, the orientation of the ridge, the artifacts collected, and the treatment and nature of the test pits are all unclear or exhibit discrepancies among the various available sources. Sources include Haecker's summary, crew notes, excavation records, the unidentified draftsman's calculations, the field specimen catalog, and the two inconsistent and incomplete site maps. Some of these discrepancies have been noted on the original forms and other documents.

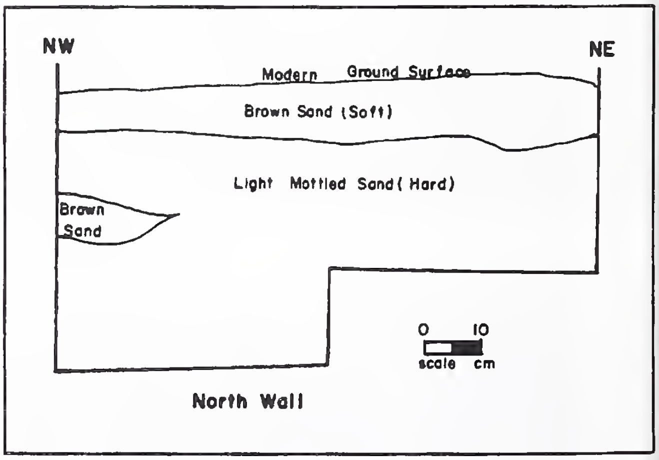
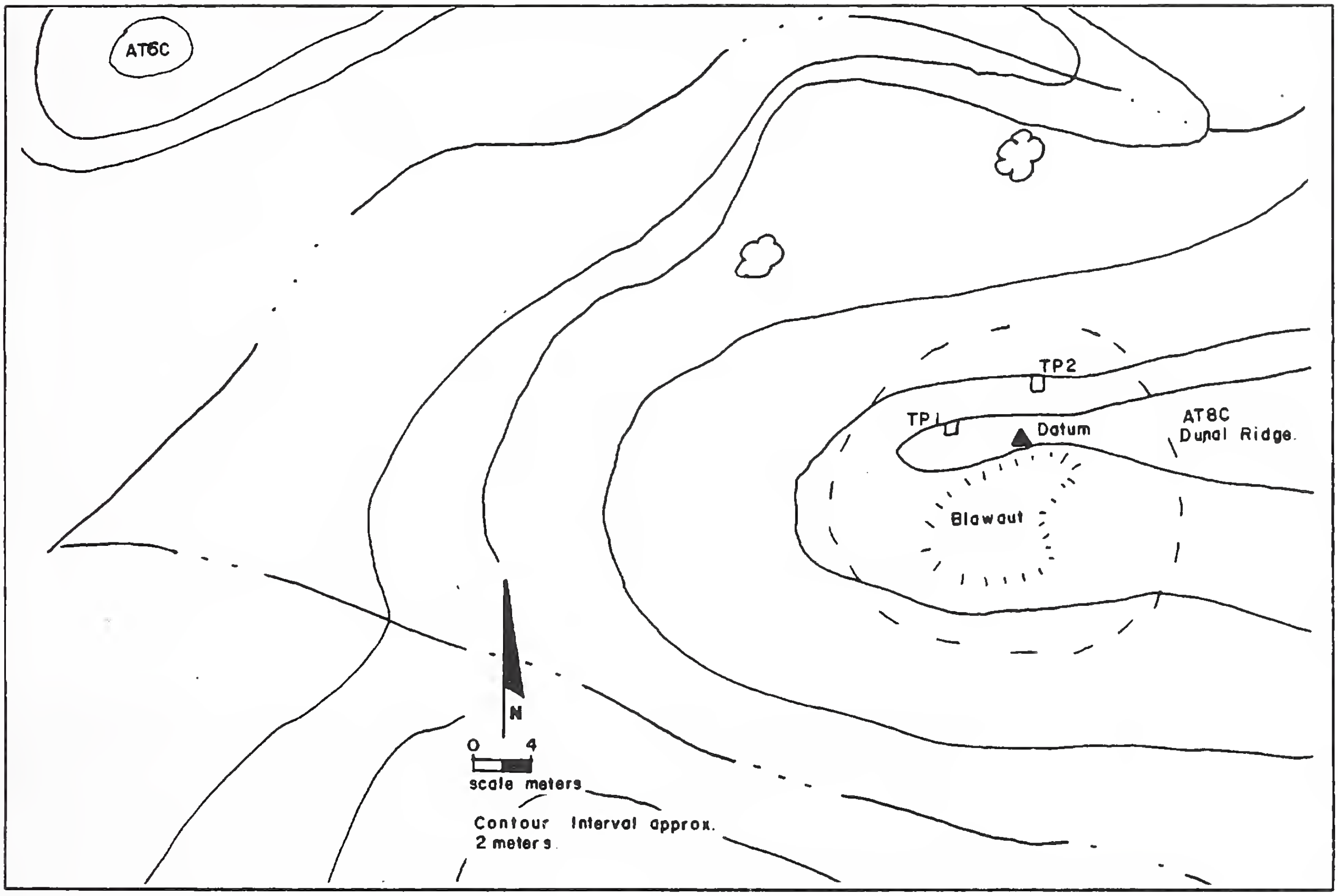


Figure 2-6. Site AT 8C, Test Pit 1.



Map 2-11. Site AT 8C and nearby Site AT 6C

Site AT 11C

Site AT 11C is a dispersed lithic and ceramic scatter with possible structural remnants. It was assigned the Laboratory of Anthropology site number LA 33923. The site is located in Township 9N, Range 1W, Section 14, on the lower fan and bajada slopes of the Llano de Albuquerque Ceja, at 5350 feet (1531 meters) elevation. Sites AT 9C, AT 10C, and AT 38C lie nearby. The site is surrounded by dune pediments except to the west, where eroded bajada slopes drop westward toward the Rio Puerco. Grasses, snakeweed, and yucca make up the vegetation in the site area; occasional junipers were noted.

Survey and Testing

The site was described on survey as an aceramic lithic scatter with projectile point fragments, having a concentrated area of 50 square meters and a dispersed area of 2000 square meters overall. It was tested on February 1, 1982, by flagging all artifacts, mapping the site, setting a site datum, and laying out a collection baseline running 30 meters northeast from datum (Map 2-12). Artifacts within the concentration were then point-plotted and collected relative to the baseline. Not all debitage items may have been collected. Shovel and auger tests were then placed every two meters along the baseline (Table 2-6). Notes suggest that artifacts outside the concentration may have been collected and their angle and distance from datum recorded, but no polar-plotted artifacts were ever catalogued.

Surface Description

Upon inspection, the site was found to consist of a sherd scatter, with occasional bone and lithic items. The site's concentrated scatter extended over about 625 square meters, with dispersed artifacts extending over approximately 6,000 square meters of area. A scatter of tabular mudstone slabs, dispersed over an one by eight meters area in the northeastern portion of the concentrated

Table 2-6. Site AT 11C, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
Shovel Test 1	A	0	90	?	B,D	No
Shovel Test 2	A	2	90		-	No
Shovel Test 3	A	4	90		-	No
Shovel Test 4	A	6	90		-	No
Shovel Test 5	A	8	90		-	No
Shovel Test 6	A	10	90	?	S	No
Shovel Test 7	A	12	90		-	No
Shovel Test 8	A	14	90		-	No
Shovel Test 9	A	16	90	?	S	No
Shovel Test 10	A	18	90		-	No
Shovel Test 11	A	20	90	?	S	No
Tests 12-16	A	22-30	90		-	No

Key: B - Bone, D - Debitage, S - Sherds

scatter, suggested the presence of structural remnants. The site was cut, along its western edge, by a dirt road. Two small, ephemeral drainages cross the site area just to the north and south of the concentrated scatter.

Surface collection of the concentrated area produced 37 sherds, five flakes, three bone items, two groundstone items, a pecked stone, two cores, and a biface base. All chipped stone was either chalcedony or silicified wood. Ceramics were mostly historic types. This assemblage is inconsistent with the survey description of an aceramic lithic scatter.

Subsurface Testing

The site subsurface (Table 2-6) was tested by placing 16 shovel and auger cuts every two meters along the baseline. The test at datum recovered two small flakes and bone. The test at ten meters northeast of datum recovered two sherds. The test at 16 meters recovered one sherd. The test at 18 meters encountered small pieces of charcoal at 30 centimeters depth. The test at 20 meters encountered a single sherd. Other tests were not reported and presumably were sterile.

Samples Analyzed

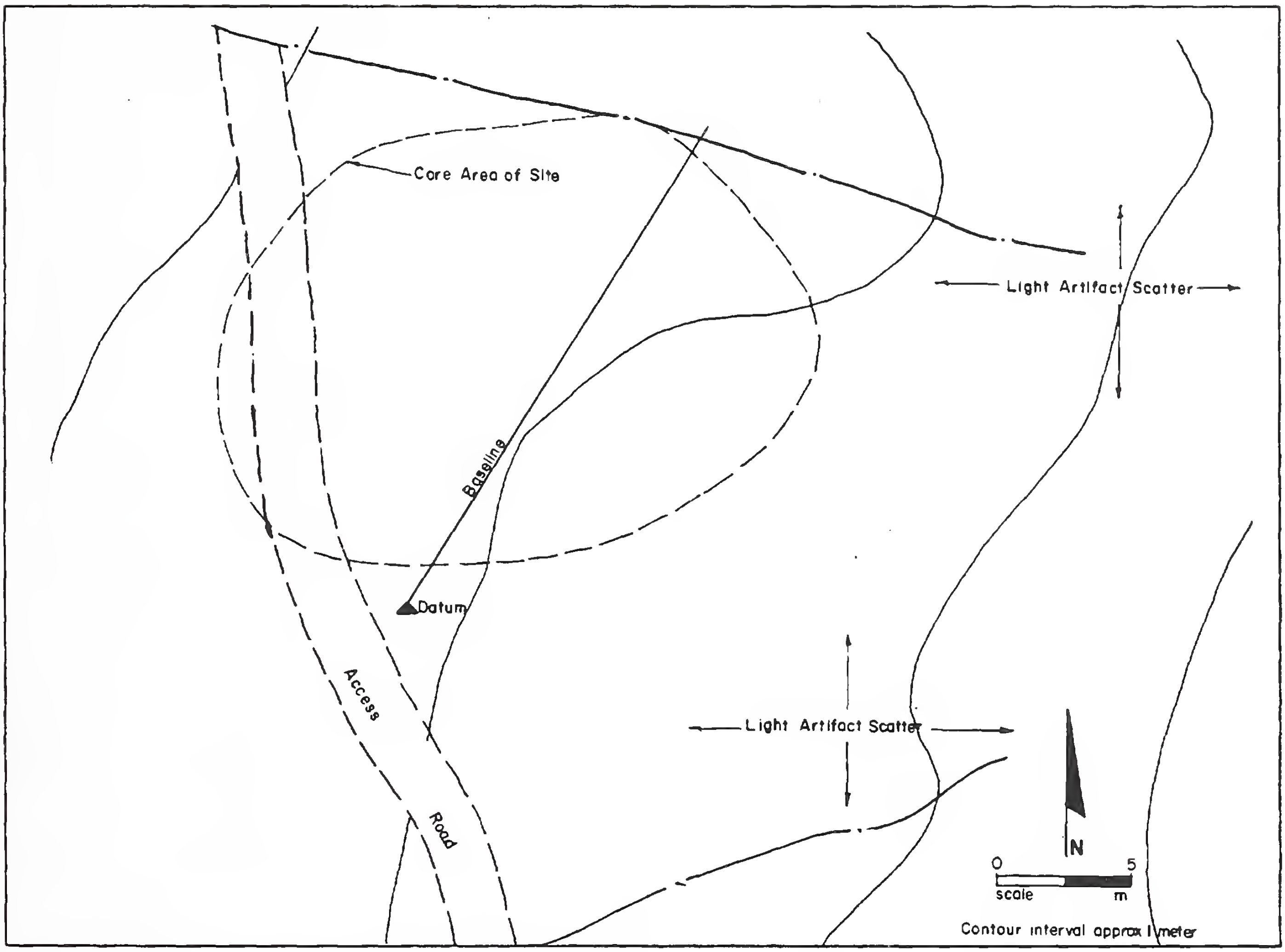
Samples analyzed from this site include 41 sherds and six items thought to have been bone or shell.

Ceramics (Warren and Warren, this volume) include Socorro B/w (three jar sherds), Acoma Polychrome (or jar sherd), and six types identified as post-Reconque Hispanic pottery: Casitas R/b (one bowl sherd), Casita Red (four bowl sherds), Manzano Black (one jar sherc Carnuel Plain (20 jar sherds), polished redware (one j sherd), and polished buffware (eight jar sherds). Th historic pottery is thought to pertain to an occupatic dated after A.D. 1860. Manufacture was local, possib employing swamp or cienega clays rather than older cla shales. The Socorro B/w contained temper indicatir Rio Puerco or Rio Salado manufacture.

Items thought to be bone were analyzed by the senio author (Bertram, this volume), who was unable to ider tify the items collected from this site. He has sinc concluded that the "bone" items were mineralized foss bone or shell pieces, probably of Pliocene or ear Pleistocene age. These items occur naturally in th strata exposed along the Ceja. Hence, there are n clearly archeological bone items in collections from th site.

Comments

This site clearly represents an historic camp of som sort, probably dating to the Late Territorial Period. Als present are one or more prehistoric components, repre sented by lithic items. The Socorro B/w sherd may hav been dropped by historic occupants. There may be



Map 2-12. Site AT 11C core area and light artifact scatters.

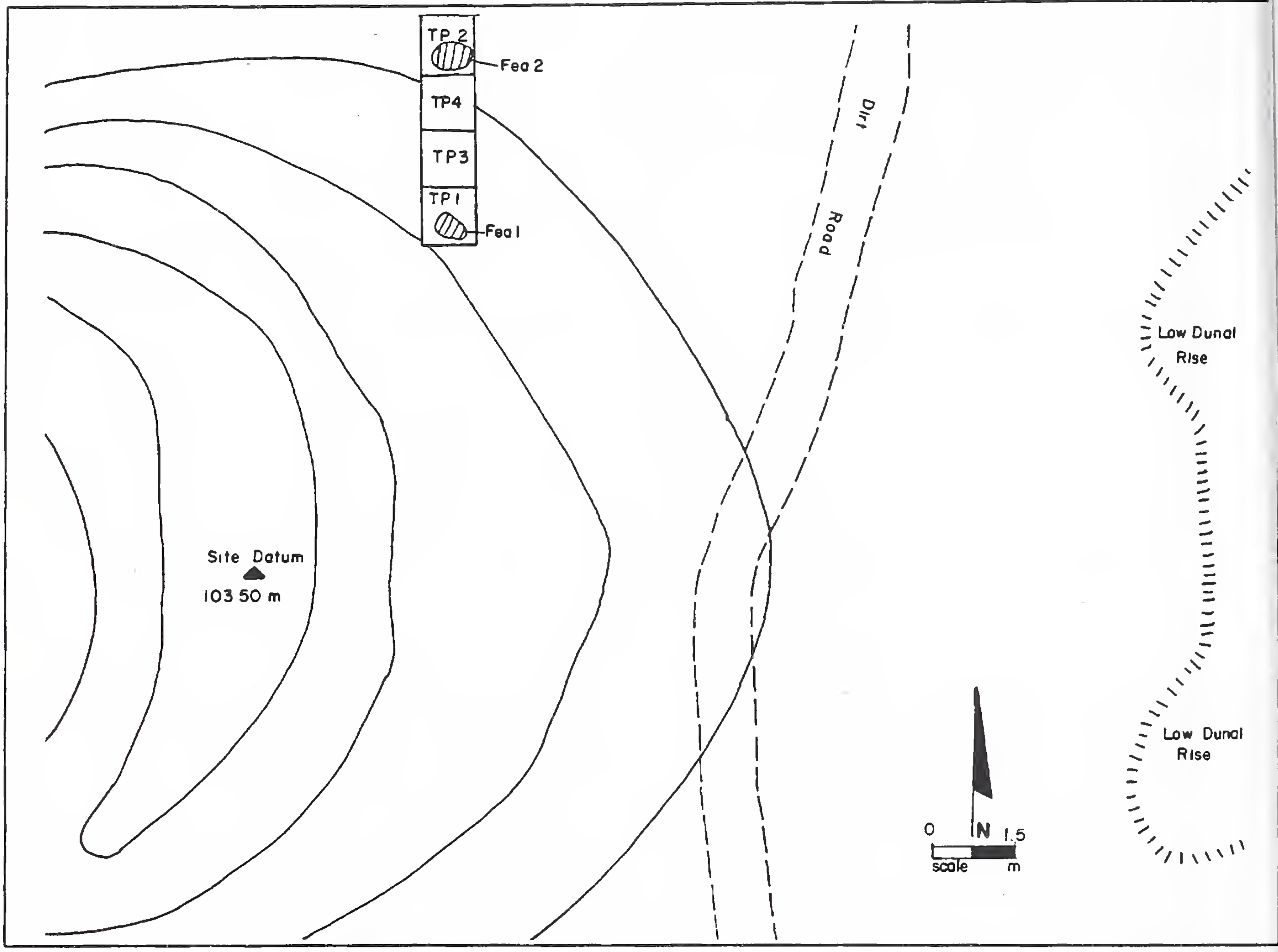
structure preserved at this site; testing data are inconclusive as to the nature of the mudstone alignment and associated ash and charcoal, but the possible structure can be approximately dated by probable association of Acoma Polychrome ceramics to the Late Territorial Period.

Site AT 15C

Site AT 15C is a buried Pueblo I/Pueblo II structural site which may have an earlier Basketmaker component. It was assigned the Laboratory of Anthropology site number LA 33927. The site is located in Township 9N, Range 1W, Section 14, at 5320 feet (1622 meters) elevation. The site is set on the upper edge of the Rio Puerco floodplain, at the foot of the Llano de Albuquerque bajada. The site lies on and at the foot of a low, gravel-covered rise which stands about 12 feet (3.5 meters) above the surrounding floodplain. Site AT 14C is nearby to the northwest. Vegetation is a mixture of shrubs, grasses, and cacti on floodplain and slope soils with occasional sheet dune formations. Away from the low rise, to the southwest, are shallow, local slopes of approximately two percent.

Survey and Testing

The site was described on survey as a sherd and lithic scatter, with Pueblo I diagnostics, distributed over 500 square meters in two loci on the east side of a low, C-shaped ridge. Only a few lithics were noted; one of the two loci was reported as a pure ceramic scatter. No features or architecture were noted.



Map 2-13. Test Pit locations at Site AT 15C.

The site was tested on several days between December 9 and December 21, 1981. Testing consisted of site relocation, artifact flagging, and mapping relative to a datum established atop the low rise. The site was found to conform well to the survey description (Map 2-13). Bone, several sherds, and a baking powder can were then collected. In the course of mapping, two small ash and charcoal stains were discovered about two meters apart and lying three meters east and eight meters north of datum.

Test Pits 1 and 2 were placed over these stains. As excavation of the stains progressed, cultural deposits extending beneath the stains were recognized. In order to assess these deposits further, two additional units, Test Pits 3 and 4, were placed between Pits 1 and 2. The resulting one by four meters trench was excavated to a depth of up to 105 centimeters below surface. The discovery of very rich structural midden led to the abandonment of further surface collection, as efforts were focused on exploration of the clearly significant subsurface deposits. Each of the four units was excavated independently. Upper excavations were in artificial levels of 10-20 centimeters thickness, but as strata became better defined, lower levels were dug in natural units, subdivided in ten centimeters sublevels as appropriate. All fill was screened, with the exception of soil and flotation samples collected in bulk.

Subsurface Testing

As detailed above, the initial excavation of two test pits developed into a test trench excavation which discov-

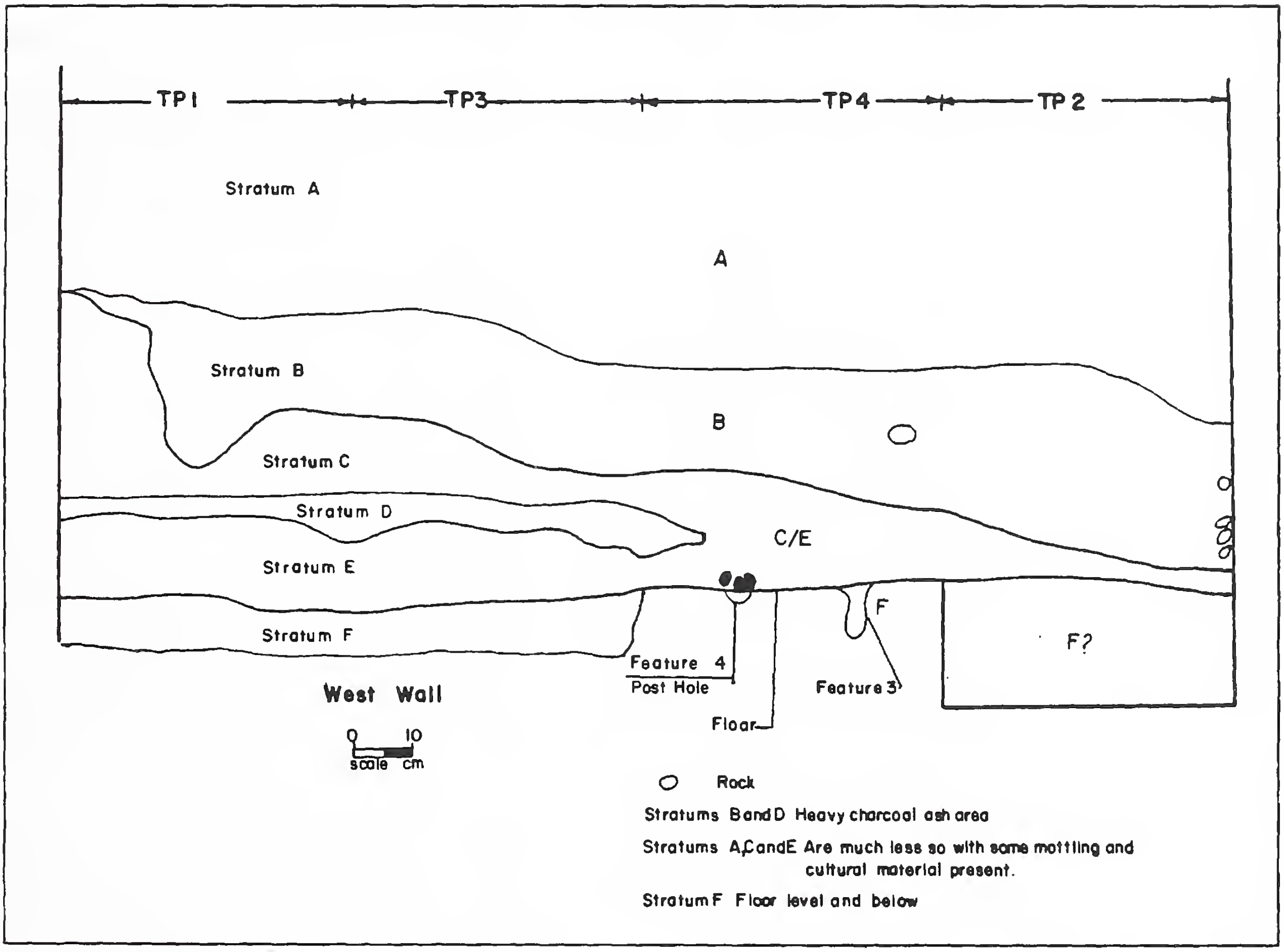


Figure 2-7. Stratigraphy of test trench in Site AT 15C.

ered deeply-buried structural and midden deposits and features, having complex stratigraphy (Fig. 2-7) and numerous cultural inclusions. Excavation data will be presented as if the units had been dug jointly, in the interest of intelligibility. The initial excavation summary, prepared by Charles Haecker, will be closely paraphrased in its presentation of stratigraphy and observations.

Test Pits 1 and 2 were established over ash/charcoal stain Features 1 and 2, respectively. In each case, the one by one meter units were laid out so as to contain completely the apparent limits of the ash stains. Test Pit 1 was laid out with its southwest corner at six meters north and three meters east, relative to datum, and it was oriented to magnetic north. Test Pit 2 was laid out within the same grid system. Its southwest corner was three meters north of the southwest corner of Test Pit 1.

Test Pit 1 was excavated in ten centimeters arbitrary levels in east and west halves until the unit surface reached 20 centimeters depth. The apparent Feature 1 was found to be a charcoal-rich midden patch within less rich midden, rather than a discrete hearth feature. Eight lithics were found, both within and outside of the stain. Pollen and flotation samples were collected from the stain.

Test Pit 2 was dug as a single 20 centimeters level. Feature 2, like Feature 1, proved to be an exceptionally rich patch of midden, rather than a hearth. Numerous flakes and sherds were found. Bone, pollen, and flotation samples were collected. The sherds recovered were field-dated to about 900 to 1050 A.D.

The complete excavation of the surface features revealed no indications of ground scorching. Instead, the charcoal stains probably represented the eroded remnants of a midden. It was decided that the excavation should continue in order to test this possibility. Accordingly, the test excavation was expanded so that there were now four contiguous one by one meter units which included the two previously laid out units. The southern intervening grid was called Test Pit 3 and the northern intervening grid Test Pit 4.

All four units were excavated as separate entities in ten and 20 centimeters-thick level increments, and the levels were correlated with their cultural strata. Excavation of the test pits ceased upon reaching what was believed to be a living surface, some 1.10 meters below the present ground surface. Stratigraphic units were recognized which were thought to correspond to alternating primary and secondary depositional events. The primary deposits appeared to be midden deposits in structures or on living surfaces. The secondary deposits seemed to be colluvially reworked midden and structural debris, including considerable quantities of burned plaster and daub. Stratigraphic descriptions of these deposits will now be presented.

Stratum A is a loose, yellow, loamy sand, which apparently blankets a buried structural Anasazi site. The two charcoal stains, Features 1 and 2, were probably intrusive into this stratum, which was found to contain relatively few ceramics and lithics when compared with the underlying strata. Stratum A slopes gently downward toward the northern end of the trench and is on average about 50 centimeters in thickness. Stratum A probably represents post-occupation deposition and soil erosion from the adjacent gravel rise, which may itself be a structural mound in part.

Stratum B is a mottled charcoal and yellow loamy sand deposit, more compact than the overlying Stratum A. This matrix contained significantly more ceramics and lithics than did Stratum A, as well as bone, macrobotanical remains, and some evidence of structure material (fired and unfired adobe chunks and tabular mudstone). Stratum B abruptly appears in the southern end of the trench profile and slopes downward toward the northern end in the same fashion as Stratum A. Stratum B is about 20 centimeters thick. Judging from the richness and condition of inclusions, it probably represents relatively intact midden deposits, including some from a jacal-type structure.

Stratum C is a compact, yellow, loamy sand with some small pockets of mottled soil similar to Stratum B. The number of artifacts in the stratum decreased relative to the number found in Stratum B. This stratum also contained no construction material. Stratum C appears to represent colluvial deposition from the adjacent gravelled rise, perhaps indicating a period of site abandonment.

Stratum D is a five to seven centimeters thick deposit of charcoal and ash which appears within the souther end of the trench (Test Pits 1 and 3). The stratu pinches out in the southern end of Test Pit 4. Ceramic lithics (including projectile points), bone, and tabula mudstone were recovered from this stratum. Stratum may represent a primary midden deposit on a livin surface. The level trend of this stratum suggests that is not colluvial.

Stratum E is a compact yellow sand containing within it matrix pockets of small pebbles as well as lithics ceramics, bone, and tabular mudstone. Stratum could not be differentiated from Stratum C where th intervening Stratum D was absent. Stratum E, lik Stratum D, overlies a flat hard surface that is believed t be a living surface. The exposure of this surface reveale at least one post hole and two other soil anomalies which may be either rodent disturbances or post holes The one definite post hole contained a fill of mixe charcoal and sand. Three cobbles were found at its bas These may represent shims used to support or reinforc the post. The excavation of the post hole indicated tha it was not set vertically; rather, it was angled toward th west, suggesting the presence of a structural featur immediately west of the test trench.

Stratum F is a compact soil composed of mixed sand an gravel. Few artifacts were recovered, all within th upper few centimeters of this stratum. However, furthe excavation into Stratum F, 15 centimeters past the E- contact, failed to produce any indication of cultura deposits. Stratum F is believed to be the sterile occupation subsurface at initial occupation of the living surfac found at the E-F contact.

Samples collected from the four test pits include abou 300 sherds, several hundred lithic artifacts (including a least two projectile points), as well as numerous bones at least two radiocarbon samples, 14 flotation/so samples, minerals and clay, several macrobotanica specimens (including corn cobs), and at least 16 polle samples, including a column pollen sample series fron Test Pit 1 and a smaller column pollen series from Tes Pit 2. Samples were collected from all horizons, including the surficial Features 1 and 2. Exact counts for eacl class of artifact are not known.

Samples Analyzed

Numerous samples were analyzed from AT 15C. Reported analyses include: nine pollen samples and a surface control sample (Scott, this volume); 49 sherds of which all were analyzed for temper and paste character (Warren and Warren, this volume); 19 flotation and macrobotanical samples (Toll, this volume) and about 500 bone items (Bertram, this volume). In addition two radiocarbon samples were submitted to the University of Texas (Austin) and six obsidian hydration age determinations were carried out by the U.C.L.A. Obsidian Hydration Laboratory;

The first radiocarbon sample, from Stratum D in Test Pit 1, produced a date of 1160 ± 70 B.P. (TX-4801, A.D. 645 to A.D. 1025 with midpoint at A.D. 835, according to the Klein et al. [1982] 95% confidence tables). The second, from Test Pit 3, Stratum D, produced a date of 1430 ± 70 B.P. (TX-4802, A.D. 440 to A.D. 710 with midpoint at A.D. 575, according to the Klein et al. [1982] 95% confidence tables).

It should be assumed, of course, that these dates are on the order of half a century (or more) too old. The best available local fuels are juniper and sage, both of which grow slowly and retain old, dead wood for very long periods. Saltbush also grows locally; it is known to have a rate of radiocarbon fixation different from that of juniper, and hence a different apparent radiocarbon age (Downton 1975; Syvertsen et al. 1976). Toll (this volume) found juniper and saltbush equally common as charcoal in this site. It is not known whether the radiocarbon dates reported here are based on species of C-3, C-4, or mixed type. If saltbush is indeed present in the dated samples, the derived dates could be too young.

Six obsidian samples were sectioned for hydration rind measurement. None were objectively sourced; those of opaque black vitrophyric obsidian were assumed to be best sourced as Pumice Mountain obsidian (Michels 1984a). The non-opaque specimens were all of a blue-gray to brown transparent obsidian which could be sourced as coming from any of the three or more well-known Jemez obsidian flow systems (Michels 1984a, b, c, 1985, 1987).

Methods for determining effective hydration temperature were described in the discussion of site AT 3B. Based on the assumed sources and hydration temperature, the inferred ages of the six samples were calculated (Table 2-7). Hydration rate equations for the rapidly-hydrating Pumice Mountain source, the moderately-hydrating Polvadera (Type 3530) source, the slowly-hydrating Obsidian Ridge-Rabbit Mountain (Type 3520-3525) source, and the very-slowly-hydrating Cerro del Medio (Type 3500?) source were used. The other Jemez sources mimic Cerro del Medio in rates, hydrating only a little more rapidly.

Inspection of Table 2-7 indicates that the obsidian dates as inferred are variably satisfactory. Specimens 25.6, 32.30, 32.31, and 46.5 date about as they should, given the ceramic and radiocarbon associations and point styles represented, and assuming that they are sourced as Cerro del Medio, Pumice Mountain, Obsidian Ridge, and Cerro del Medio, respectively. A reasonable stratigraphic sequence is implied by these four dates.

The dates for specimens 41.21 and 48.1 are preposterously recent, suggesting either that their source is not the Pumice Mountain vitrophyre, or that recent damage surfaces were sectioned, or else that their hydration birefringence patterns were incorrectly read. Of course, the inferred best dates remain speculative, since not all sources have been discovered and characterized and since all known Jemez obsidians exhibit considerable variation in appearance.

Of the approximately 300 sherds recovered from test pits, only 49 were analyzed; of these, specimen numbers (and hence exact provenience) are given in the specialists' reports only for 47. Detailed lists of type frequencies will not be presented, since we do not know the protocol used for drawing the 15 to 20% sample actually analyzed. All further remarks pertain to the analyzed assemblage only.

The ceramic assemblage is dominated by Kiatuthlanna and Red Mesa B/w; among the analyzed sample, other definite types were represented only by one sherd each of Escavada B/w and Puerco B/w. Bowls are more commonly Kiatuthlanna and jars more commonly Red Mesa. Temper analysis indicates source areas generally in central and western New Mexico, in the Red Mesa Valley and the western Rio Puerco del Este tributaries: the Rio San Mateo and Rio San Jose. Utility vessels are entirely jars. Except for one sherd of Corona Corrugated, all are graywares, and most are wide-neckbanded. In the sample, decorated sherds are twice as abundant as utility sherds.

Stratigraphic trends may be present in the ceramic collections. The lower deposits seem (on the basis of the study collection, at least) to have fewer decorated sherds. Wide neckbanded utility ware is the only ceramic type definitely known to have come from the lower strata (FS #26). Indented corrugated utility pottery appears to be restricted to the upper strata (FS #7; FS #15).

Considering that the beginning production date of A.D. 900 given in the specialists' analyses for Tohatchi Wide Neckbanded (from Breternitz 1966) is almost certainly too late by at least a century, the ceramic date implied for the lower occupation is not inconsistent with the radiocarbon dates reported for Stratum D. Undoubtedly, the upper midden, Stratum B, is younger, dating by ceramics to (probably) the middle Pueblo II period. In the studied collection, the numerical predominance of

Table 2-7. Site AT 15C, Obsidian Hydration Dates, Jemez Sources.

F.S. No.	Find Locus*	Artifact Type**	Probable Material	Hydration Rind (microns)	Inferred Age by Material Type (years B.P.) Pumice Mt. (Grants)	Polvadera (3530)	Obs.Ridge (3520)	Cerro del Medic
25.6	TP.2,L.10	TAP	"Jemez"	2.8	381	654	750	1250
32.30	TP.3,Strat.B	CNAP	"Grants"	4.4	941	1615	1853	3088
48.1	TP.4,Strat.C	S/CNAP	"Grants"	1.1	59	101	116	193

Key: * TP...Test Pit; L...Level; Strat...Stratum Designation
** AP...Arrow Point; AD...Angular Debris; T...Triangular, un-notched; CN...Corner-notched; S/CN...Side/Corner-notched

wide neckbanded over narrow banded or corrugated sherds certainly suggests that an early to middle Pueblo I component is also present, as the radiocarbon dates would suggest.

The macrobotanical samples from Stratum A indicated consumption of goosefoot and purslane seeds, yucca pods, and corn. In Stratum B, juniper, goosefoot, pigweed, prickly pear, and corn seeds were found as charred specimens. Stratum E produced goosefoot and corn. Also in this level were wood charcoal samples which were identified as an equal mix of juniper and saltbush. Corn samples were comparable to those from other, roughly contemporary sites, but were evidently grown under less-than-optimal conditions (unfilled rows, deformities). Numerous other species of potential economic importance were reported only as unburned and therefore perhaps intrusive examples. These included especially dropseed, ricegrass, stickleaf and globemallow.

The pollen samples analyzed from this site were restricted to a modern control, samples from Features 1 and 2, and samples from colluvial/structural collapse Strata A, C, and E. Pollen preservation was good to excellent. No trends could be isolated. Scott found that samples from Stratum E were essentially identical to those from Feature 1. The lower levels may contain higher frequencies of corn pollen and corn pollen clumps, but corn pollen was found in significant quantities in every sample. Other important and ubiquitous pollens included beeweed, prickly pear and cane cholla.

Less ubiquitous economic pollens were also found to differ in abundance among samples. In Stratum E were found higher than typical frequencies of sage, grass, and composite pollens. Stratum C differed from the modern surface in its higher abundance of mormon tea and lower abundance of grasses. Pigweed and goosefoot pollen were more abundant in Stratum A than in the modern sample. Feature 1 produced unusual freque cies of a legume pollen unlike that of the domestic bean Feature 2 was unusual for its high frequencies of pine pinyon pollen.

Three species of introduced or Mesozoic/Early Cenozo fossil pollens were found in near-surface samples: eln alder, and pecan. Elm pollen was also found in dee context in Strata C/E (FS #83). Scott judged that thes forms were probably fossil remnants.

Bone items amounting to 500 specimens were recovere and analyzed. It appears that the analytic collectio was, in fact, the entire recovered sample, with on exception: shell and worked shell are reported in fiel notes but were not submitted for analysis. Bone pres ervation was judged to be generally good to very good

Taphonomic indications from the bone assemblage sug gest that the deposits represented by Strata B, D, an perhaps E accumulated rather rapidly, while the clearl colluvial Strata A and C displayed bone damage consis tent with slow soil accretion and concomitant weatherin It is likely that Stratum C may have been considerabl thicker at one time and was eroded immediately prior t the deposition of Stratum B. Had Stratum C alway been as shallow as it appears in profile, root-etchin should have been much more common in Stratum D immediately below, due to soil development and plan growth on the surface of Stratum C.

Taxa recovered were dominated by cottontails and jack rabbits, with much rarer wood rats and artiodactyls Stratum A produced a cottontail, a jackrabbit, an infan rabbit, a wood rat, and an artiodactyl. Stratum B produced three jackrabbits, two or three cottontails, a wood rat, and an artiodactyl. Strata C and C/E pro duced a jackrabbit, two cottontails, a wood rat, and an artiodactyl. Stratum D produced a jackrabbit, thre cottontails, and an artiodactyl. Stratum E produced a jackrabbit and a cottontail.

The clearly mixed nature of Strata A, C, and E preclude reasonable seasonal estimates. Stratum B has no clear seasonal indicators. Stratum D would appear to have a summer-early winter component, based on the young cottontail.

Taxa and representation are rather typical for San Juan Basin Anasazi sites (cf. Akins 1984; Bertram 1988); no Rio Puerco del Este small sites are well enough published for comparison. This site is unusual mainly in its relative lack of artiodactyls, abundance of processed wood rats, and absence of prairie dogs.

Comments

This site appears to be a deeply buried, well-preserved, stratified, multicomponent Anasazi occupational/structural site, having Pueblo I and Pueblo II components. An earlier component may also be present. Subsistence seems to have been centered on corn production in the immediate vicinity, augmented by small and large game hunting, especially of rabbits, artiodactyls, and wood rats, and gathering of local greens, cactus fruits and other plant foods. Ceramic affinities and inferred ceramic sources lie mostly to the west. If the ceramic analysis sample is representative, a shift from disposal of mainly jars in the earlier occupation to mainly bowls in the later occupation may be indicated. This might suggest a change from a small satellite site in Pueblo I times to an occupational or ceremonial site in Pueblo II times.

Site AT 17C

Site AT 17C is a very sparse lithic and ceramic scatter. It was assigned the Laboratory of Anthropology number LA 33932. The site is located near the center of Township 9N, Range 1W, Section 12, at 5520 feet (1682 meters) elevation. It lies on a dune top ridge on the middle slopes of the Llano de Albuquerque Ceja and consists of artifacts exposed in a dune blowout. Local vegetation is sparse and is dominated by low shrubs with a few scrub junipers.

Survey and Testing

The site was described on survey as a small, sparse lithic scatter (core area 80 square meters; total area 150 square meters) exposed in a blowout on the north slope of a westerly-trending ridge-top coppice dune. Observed artifacts included a few burned rock fragments, several secondary chert flakes, a chalcedony core, chalcedony angular debris, and a sherd of El Paso Brown pottery, which was collected.

Testing was done on December 15, 1981. The site was tested by setting a datum on the dune crest, compass-and-pace mapping and photographing, and collection of visible artifacts. Then two test trenches, each 0.5 meters by 3 meters in size, were excavated; a single one by one meter test pit was dug in the center of the blowout. Random auger tests were dug.

Surface Description

On inspection, the site proved to be consistent in layout but somewhat different in contents from the description of the survey crew. Surface artifacts included only a hammerstone, two or three sherds, a large fragment of angular debitage, and two flakes. All were collected; no accession record of the flakes is preserved.

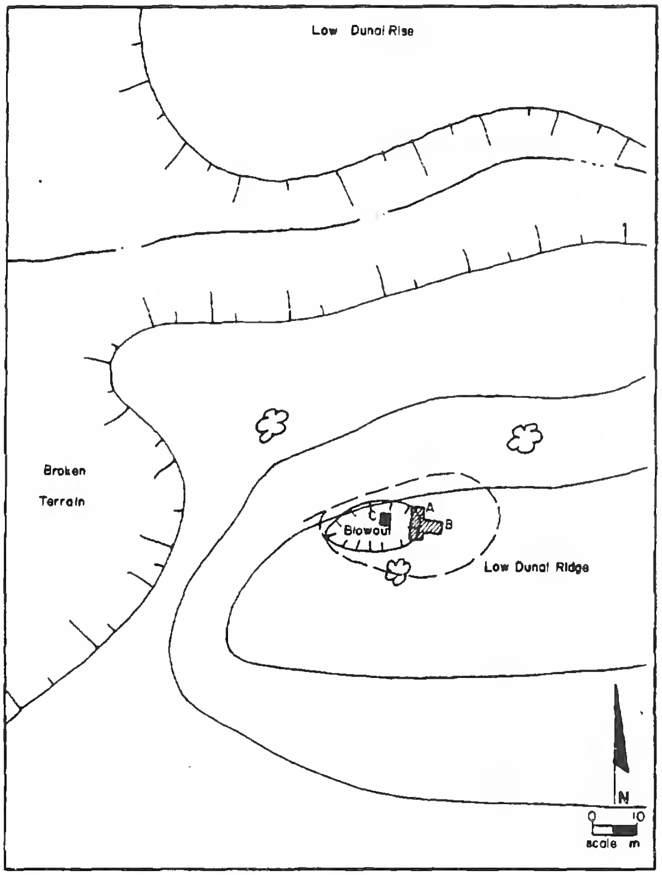
Subsurface Testing

Excavation consisted of opening two trenches, each 0.5 meters by 3 meters, oriented at right angles, and aligned on the dune crest above and to the east of the blowout (Map 2-14). The unit paralleling the blowout edge was called Unit A; the perpendicular unit was called Unit B. A third test pit was excavated to the west of Units A and B. This pit, named Unit C, was one meter by one meter in dimension. It was placed about five meters west of the intersection of Units A and B. The two trench units were excavated to a depth of 70 centimeters below surface, at which depth a hardpan stratum was encountered. Unit C was excavated to a depth of 30 centimeters below surface, and auger tests were dug to probe below this depth. No plans, profiles, or photographs of the test units or auger tests are available.

No artifacts were encountered in the excavations; two flakes were reported collected from the surface of Unit C. Unit A produced a few charcoal flecks at 30 centimeters below surface. Unit B encountered flecks at 60 centimeters below surface. Unit C encountered no ash or charcoal. An unspecified number of auger tests to 30 centimeters depth were then placed randomly about the site; all were evidently sterile.

Samples Analyzed

Samples from this site were limited to two Socorro B/w jar sherds and a Polished Brown jar sherd (Warren and Warren, this volume). It is likely that the brown sherd is the same piece collected on survey and tentatively identified as El Paso Brown. Its temper contained mica schist, common in basement rocks of the Sandias,



Map 2-14. Site AT 17C.

Manzanos, and Sierra de Los Ladrones, as well as in the Rio Grande (Santa Fe) gravels. The Socorro B/w sherds were not analyzed.

Comments

This site's assemblage is so sparse as to defy interpretation. It has value in indicating the changes in site visibility to be expected within only two fall and winter months, the length of time elapsed between survey and testing.

Site AT 18C

Site AT 18C is a sherd and lithic scatter with associated burned rock. It was assigned the Laboratory of Anthropology site number LA 33933. The site is located in Township 9N, Range 1W, Section 12. It is set on the bajada slopes of the Llano de Albuquerque Ceja, atop a ridge-crest dune, at 5520 feet (1682) elevation; it lies 300 meters downslope to the north-northwest of site AT 17C. Sites AT 19C and AT 21C lie nearby to the northwest and northeast. The site is vegetated sparsely by bunchgrass and small snakeweed bushes.

Survey and Testing

The site was described on survey as a lithic and ceramic scatter with burned rock associated. Artifacts were concentrated in three areas. A lithic scatter, a ceramic scatter, and a sherd and lithic scatter were noted, along with two scatters of burned rock interpreted as possible hearths. The site was estimated to extend over 50 square meters of concentrated area and well over 200 square meters of dispersed area. Fragments of what was thought to be bird bone were collected, as apparently were several sherds, reported after preliminary identification as Santa Fe B/w. Corrugated utility sherds were also noted as present.

The site was tested on December 17, 1981. Testing began by relocating artifacts and preparing a transit and pace-chain map. A datum stake was placed on the dune crest between the two loci. Surface artifacts were plotted and collected. Three test pits were excavated; each was of 0.5 by 3 meters size. Auger testing was done in the fill beneath each test pit. Additional auger tests were randomly placed.

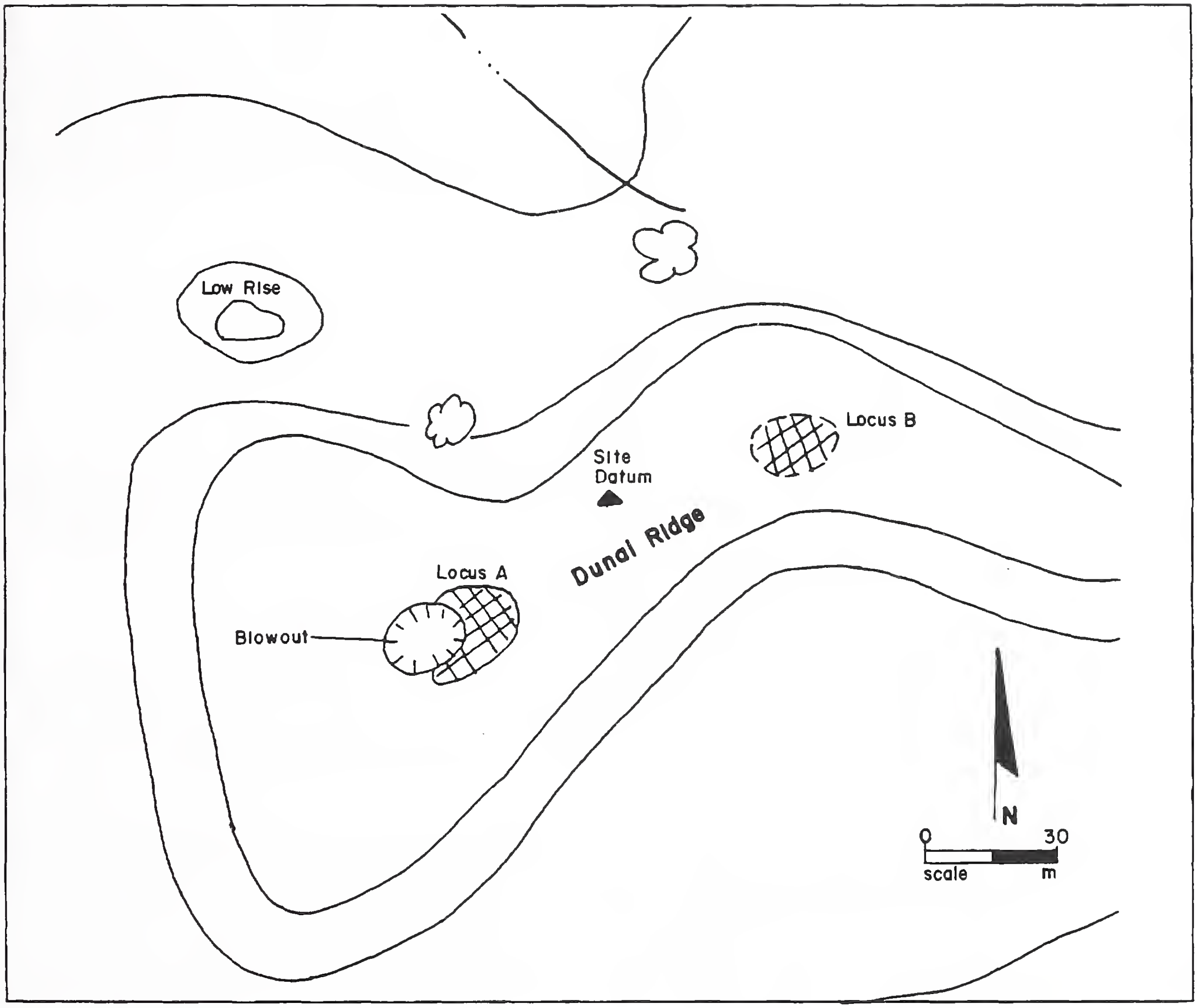
Surface Description

The site was found to consist (Map 2-15) of a ceramic and lithic scatter with possible hearths (Locus A) and a lithic scatter about 60 meters to the east-northeast (Locus B). About 18 chipped stone items, a piece of groundstone, and two sherds were collected from the site in the course of testing. No further data are available.

Subsurface Testing

Three test trenches, labeled as Units A, B, and C, were excavated. Each was 0.5 by 3 meters in size. Exact locations of the three units are unknown. However, Unit 1 is reported to have been placed on the ridge crest, while Units 2 and 3 were placed on the slope and base of one of the two blowouts. The orientation of Unit 2 is unknown. Units 1 and 3 were oriented with their long axes east-west (magnetic).

Unit B was dug to a depth of 30 centimeters A small flake was found in the loose surface fill. Unit A was dug to a depth of 60 centimeters; a flake and a few small, charred seeds reportedly were collected from the lower fill above the hard packed subsoil, encountered at 60 centimeters depth. Unit C was dug to a depth of 53 centimeters; burned and unburned bone and an angular debris



Map 2-15. Site AT 18C.

fragment were found in the lower fill. Unit B may have been dug an additional 30 centimeters down; a sample of bone was catalogued as from Trench 2 but analyzed as from Unit A. Charcoal flecks were encountered in the upper fill of either Unit A or Unit B. Each of the three units was then augered to an additional depth totaling 90-120 centimeters below surface. Nothing more was found. Neither clear photographs nor stratigraphic plan-profile drawings can be presented for these trenches.

An unspecified number of auger tests were reported to have been dug across the site; all were evidently sterile.

Samples Analyzed

Samples from this site included five sherds (Warren and Warren, this volume) and bone and shell (Bertram, this volume). The seeds from Unit A, variously provenienced as from Trench 2 and from Test Pit 2, were apparently never analyzed; it may be that bones were actually collected and their identity misapprehended or mistranscribed. In fact, an unidentified small mammal bone fragment (FS #23) was catalogued as from "Trench 2, lower 30 centimeters level." Other faunal specimens from the site included seven pieces of unidentified mollusk shell, at least one of which was worked and polished (FS #1), and a collection of jackrabbit vertebrae, snake vertebrae, and small mammal fragments, which may have been roasted, stained, or fecal (FS #24). The catalog data for FS #1 identifies the item as singular and a lithic; no mention of shell jewelry fragments is made in any site notes. The "bird bones" collected on survey may be the shell fragments.

Ceramics from the site included a Socorro B/w jar sherd, one Santa Fe B/w and one Galisteo B/w bowl sherd, and two unidentified whiteware jar sherds. The Socorro sherd and one of the whiteware sherds came from vessels made in west-central New Mexico.

Comments

The documentation for this site is inadequate to permit assessment.

Site AT 19C

Site AT 19C is a problematic site which may contain a Pueblo III ceramic scatter and angular debitage. It was assigned the Laboratory of Anthropology site number LA 33934. The site is located in Township 9N, Range 1W, Section 12, 400 meters northwest of site AT 18C, at 5450 feet (1661 meters) elevation. The site is set in a blowout on a ridge-crest dune. An arroyo runs about 100 meters to the north.

Survey and Testing

The site was described as a Pueblo III sherd and lithic scatter, having no evident features, lying in a blowout on a dune crest. Lithics and ceramics were collected. Sherds were described as Corona Corrugated and Santa Fe B/w. Lithics were characterized in the field as angular debris of chalcedony and quartzite. One lithic was reported to exhibit evidence of burning. The site was reported to extend over 50 square meters of concentrated area, with a dispersed area of 600 square meters in all.

The site was tested on an undetermined date. Testing was complicated by the crew's inability to locate any artifacts whatsoever. A datum was placed and the "site" was mapped (Map 2-16). Two test trenches, each 5 by 0.5 meters in size, were excavated until a consolidated sand substrate was reached at around 40 centimeters below surface. The hard stratum was then augered to a final depth of 70 centimeters below surface. Neither artifacts nor other cultural evidence were found. Auger tests were then placed across the site; about 13 auger tests were dug. All were sterile.

Samples Analyzed

Samples analyzed include only the four sherds collecte[d] on survey (Warren and Warren, this volume). These a[re] one sherd each of Santa Fe B/w, unidentified whitewa[re] (Santa Fe?), ref. Corona Micaceous Corrugated, and R[io] Grande Micaceous. All are jar sherds. Production age[s] for the three known types suggest Late Pueblo III or ear[ly] Pueblo IV occupation.

Comment

This site remains known only through survey descrip[-]tion and the four collected sherds.

Site AT 20C

Site AT 20C is a problematic, dense lithic scatter o[f] secondary and tertiary reduction debris which produce[d] a corner-notched dart point. It was assigned the Labo[-]ratory of Anthropology site number LA 33935.

Survey and Testing

The site was described on survey as a dense (5 items pe[r] square meters) secondary and tertiary reduction statio[n] exposed in a blowout on a sandy rise. The site'[s] concentrated area was estimated at 400 square meters with an additional 2,000 square meters of dispersed area. A corner-notched dart point was collected.

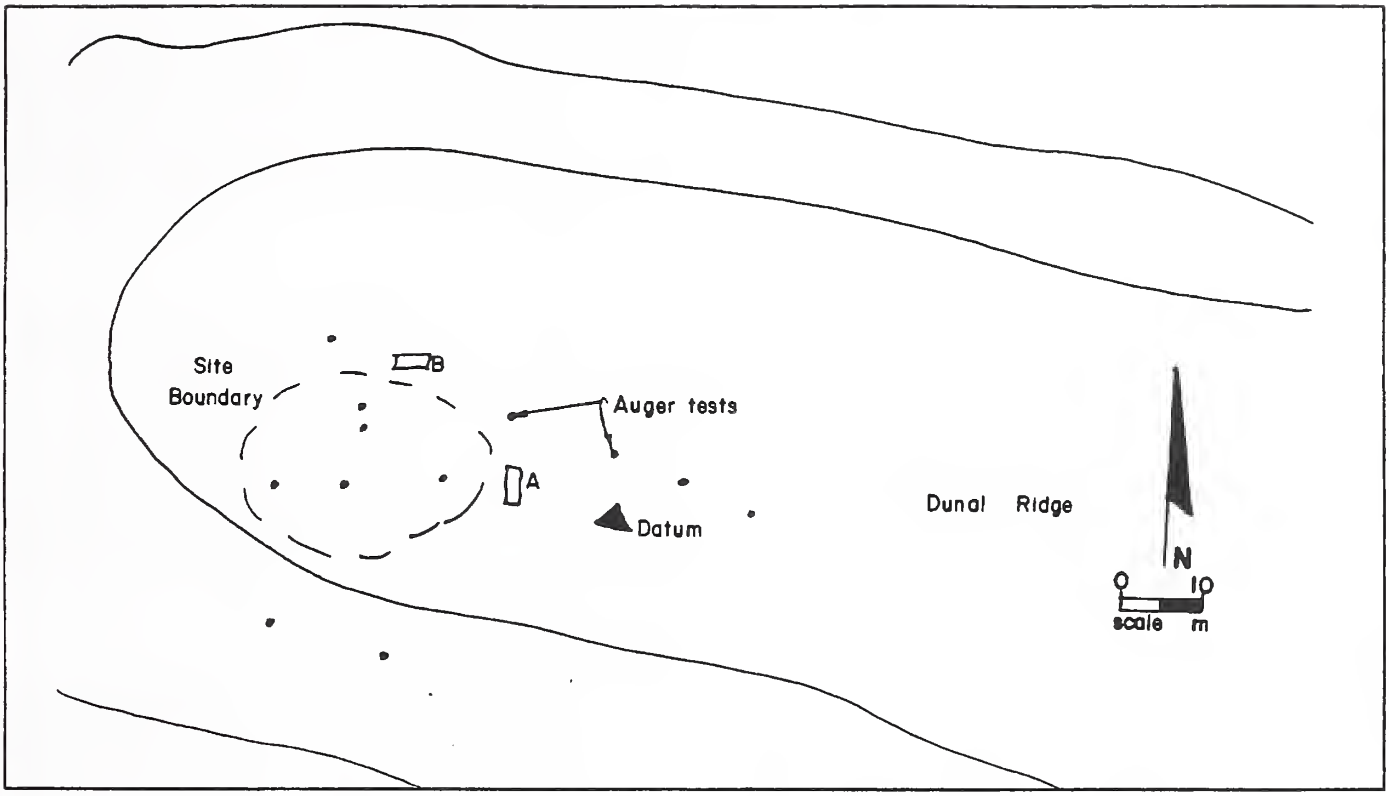
The site was tested on an undetermined date. Testin[g] was complicated by the crew's inability to locate an[y] artifacts whatsoever. A datum was placed and the "site[" was mapped (Map 2-17). Two test trenches, each 5 b[y] 0.5 meters in size, were excavated on either side of th[e] blowout until a consolidated sand substrate was reached. The hard stratum was then augered an additional 3[0] centimeters below excavated surface. Neither artifacts nor other cultural evidence were found. Auger tests were then placed across the site; about 10 auger tests were dug. All were sterile.

Subsurface Testing

Neither of the two excavated trenches encountered any cultural remains. None of the auger tests encountered cultural remains. Neither plans nor profiles of the excavated units are available.

Samples Analyzed

No samples other than the dart point appear to have been collected on survey; nothing was found in testing. Analysis of the dart point is not available.



Map 2-16. Site AT 19C.

Comments

This site remains known only through survey description. However, given the high densities of artifacts reported from survey, it seems likely that the testing team failed to relocate site AT 20C correctly. Had they excavated over five square meters of fill to a significant depth within the "survey site," artifacts would certainly have been encountered.

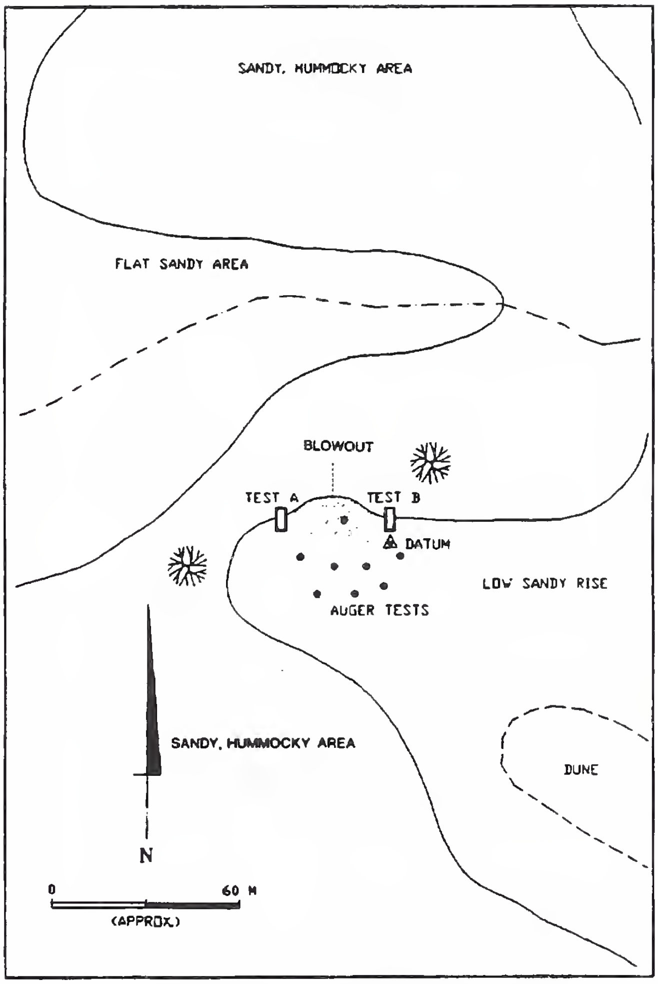
Site AT 21C

Site AT 21C is a dispersed lithic and ceramic scatter with three loci, at least two of which have Pueblo I-Pueblo III ceramics associated. The site was assigned the Laboratory of Anthropology site number LA 33936. The site is located on the northern border of Township 9N, Range 1W, Section 12, at 5505 feet (1678 meters) elevation. Site AT 18C lies 300 meters to the southwest. The site is set in an area of low dune-capped ridges. Vegetation is sparse, with grasses and snakeweed as a discontinuous understory and small juniper trees as overstory. Wind erosion is extensive but discontinuous.

Survey and Testing

The site was described on survey as a small, dense lithic scatter having a core area of 40 square meters and a dispersed area of 200 square meters. At least one sherd of a "Pueblo III jar" was found in association and collected.

The site was tested on January 15 and 18, 1982. Testing entailed determination of site extent, which was done by pin-flagging artifacts. Additional loci were discovered in the course of flagging. The newly-enlarged site was defined as containing three loci, each an artifact scatter exposed in a blowout. These three loci were each assigned a subdatum. Each locus was mapped. A baseline 100 feet (30.48 meters) long was run across each locus; all artifacts within 50 feet (15.2 meters) of the baselines were collected and piece-plotted. Shovel and auger tests were dug at five feet (1.5 meters) intervals along the baselines (Table 2-8). A hearth was found; it was excavated and the fill collected for flotation.



Map 2-17. Site AT 20C.

Surface Description

The site, considerably expanded beyond the surve definition, was found to consist of three loci, each abou 30-50 meters in diameter and set apart at 40-70 meter distance, one from another (Map 2-18). Datum point were set at the east margin of each locus, and a 100 fee (30.48 meters) baseline was extended to the west of eacl datum point.

All artifacts falling within 50 feet (15.2 meters) of th baseline were collected and their provenience specifie by triangulation. Collected from Locus 1 were 13 flakes five sherds, bone, and three possible cores. Collecte from Locus 2 were a mano, a hammerstone, hammerstone/core, 12 flakes, and two flakes whicl showed utilization or edge damage. From Locus 3 wer collected three burned rocks, 14 flakes, a hammerstone bone, a mano, two cores, and four sherds. A hearth wa discovered in the western margin of Locus 3. Associate were ash, charcoal, and burned rock.

Subsurface Testing

Shovel and auger tests were dug along each of the thre baselines (Table 2-8). Tests were dug to a depth of 3 centimeters below surface, then augered for an unre corded additional depth.

In Locus 1, one flake was found in the upper fe centimeters of soil in each of the tests at 95 feet (28.9 meters), 90 feet (27.43 meters), and 85 feet (25.9 meters) west of datum. In Locus 2, one flake was foun in the upper soil at each of the tests at 100 feet (30.4 meters), 75 feet (22.86 meters), and 50 feet (15.2

Table 2-8. Site AT 21C, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
Test 18	B	25.91	270	?	D	No
Test 19	B	27.43	270	?	D	No
Test 20	B	28.96	270	?	D	No
Test 25	A	3.05	270	?	D	No
Test 32	A	15.24	270	?	D	No
Test 37	A	22.86	270	D		No
Test 42	A	30.48	270	?	D	No
Test 46	C	4.57	270	?	S	No
Test 47	C	6.1	270	S		No

Key: D - Debitage, S - Sherds

meters) west of datum. Three flakes were found in the test at 10 feet (3.05 meters) west of datum. In Locus 3, a sherd was found in each of the tests at 15 feet (4.57 meters) and 20 feet (6.1 meters) west of datum. No other artifacts or ash were noted from shovel and auger tests.

The hearth at the west edge of Locus 3 was excavated. A flotation sample and a flake were collected. No plan, profile, photograph, or description of this feature has been located.

Samples Analyzed

Samples analyzed from AT 21C included 13 jar sherds and one bone. Apparently the flotation from the hearth was never submitted.

The bone collected from Locus 1 (FS #24) was determined to be a large cow or bison left tibia shaft fragment, badly weathered and exhibiting rodent gnawing and perhaps partial digestion (probably from canid saliva, as the item was too large for most predators to ingest). Contours were rounded and softened in spite of the severe surface-exposure weathering. The object may be a dog or coyote toy. It is probably unrelated to the other items found on the site.

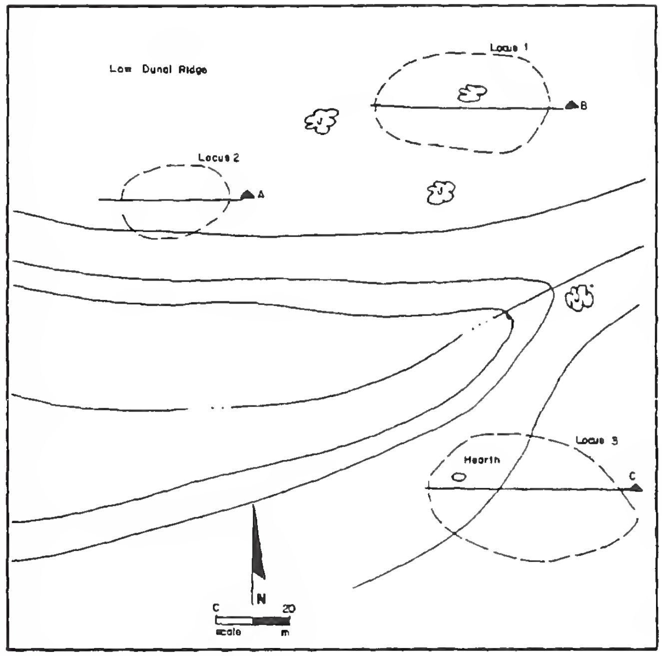
The sherds (Warren and Warren, this volume) represented at least three jars, including a Socorro B/w (1 sherd), a Tohatchi Banded (five sherds), and an undiagnostic grayware utility (seven sherds). All were tempered with materials suggesting manufacture in west-central New Mexico. The Tohatchi Banded sherds analyzed (four of five) were recovered from Locus 1 (FS #s 6,8,14,17). The single plain grayware sherd analyzed was recovered from Locus 3 (FS #49). The locus from which the Socorro sherd was collected is not known. On these grounds, it would seem inappropriate to estimate an overall site age.

Comments

This site seems to represent one or more lithic extraction and/or food-processing camps, dating at least partly to late PI through Pueblo III times. Lacking data from the excavated hearth, little more can be inferred.

Site AT 22C

Site AT 22C is a lithic scatter with associated burned rock and at least one Pueblo I/Pueblo II sherd. It has been assigned the Laboratory of Anthropology number LA 33937. The site is located in the northeast corner of Township 9N, Range 1W, Section 12, at 5600 feet (1707 meters) elevation. The site is set on the eroded bajada



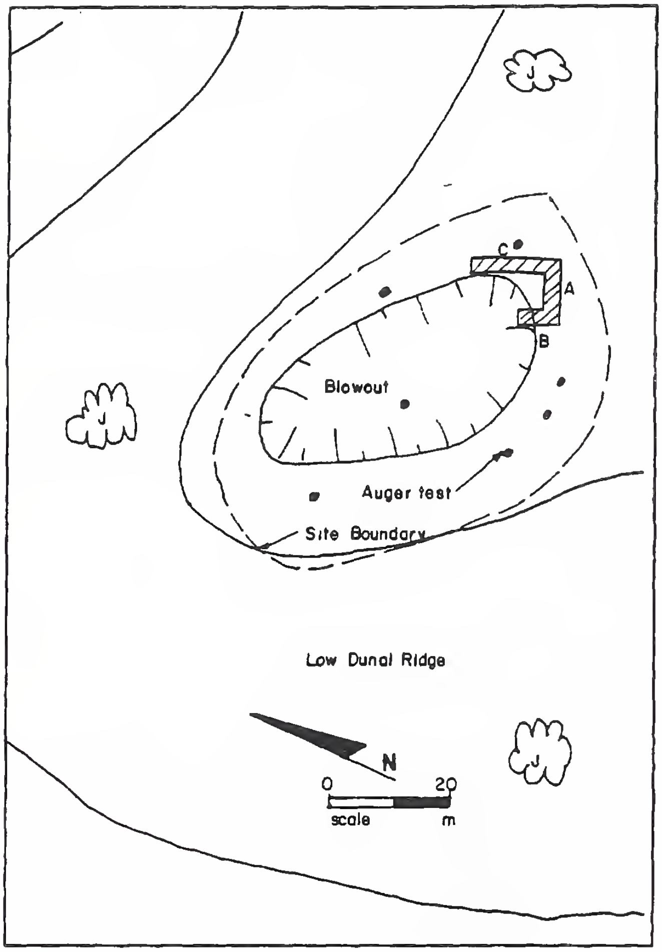
Map 2-18. Site AT 21C.

slopes of the Llano de Albuquerque Ceja, at the point where they merge into the uppermost bench of the Rio Puerco valley. Site AT 20C is nearby to the south. As with other sites in the area, this site was discovered in a blowout eroding a low ridge-top coppice dune. Local vegetation is clump grasses, snakeweed, rabbitbrush and occasional junipers.

Survey and Testing

The site was described on survey as a probable quarry location with large primary and secondary debitage items and burned rock eroding from a blowout on the south side of a low dune. The depositional level of artifacts seemed to be about two meters below the dune crest. A sherd of La Plata B/r was collected, as apparently were lithic specimens. The site was judged to have a concentration of about 100 square meters of area, with dispersed artifacts extending over an additional 6000 square meters of area.

The site was tested on December 16, 1981. Testing began by photographing and mapping the site area and establishing a datum on the ridge immediately north of the blowout. Three test scrapes or shallow trenches were then laid out on the dune to the southeast of and immediately above the blowout (Map 2-19). Surface artifacts were collected from each trench area. Each trench was 0.4 to 0.5 meters in width. Trenches 1 and 2 were three meters in length; Trench 3 was 8.2 meters



Map 2-19. Site AT 22C testing areas.

in length. Artifacts outside trench areas were collected without plotting. Auger tests were placed randomly about the site. Trench substrates were auger tested. Fill was screened.

Surface Description

The survey description was found to be accurate, except that more items were present in the upper areas tested by Trenches 1-3 than were reported on survey. On the surface of Trench 1 were found three burned rocks and an angular debitage fragment. On Trench 2 were found four items of debitage, four burned rocks, and a piece of groundstone. No artifacts were found on the surface of Trench 3. Fifteen debitage items were found elsewhere on the site.

Subsurface Testing

Testing consisted of excavation of Trenches 1-3, gether with auger testing, as noted above. Trench 1 dug to 60 centimeters depth; ash and charcoal stain with bits of burned rock associated, was found fron to 40 centimeters depth. Five chert and silicified w flakes were encountered in the upper layers. The was closed at 60 centimeters depth on hardpan. Tre 2 was dug to 60 centimeters depth; four flakes and a charcoal flecks were encountered in the upper dep Trench 3 was dug to 15 centimeters depth; three fla were found in the upper few centimeters of deposit, no stains were noted. Auger testing of the site faile reveal any other cultural deposits.

Samples Analyzed

One sherd of La Plata B/r, a bowl sherd, was colle on survey and analyzed (Warren and Warren, this ume). The temper of this sherd indicated manufact as would be expected, in the San Juan-northern F Corners area where the type is known to have b made. La Plata B/r was a widely-traded late Puebl early Pueblo II type.

Comments

This site is difficult to evaluate. It is probably a persed quarry-lithic extraction site with features, wh has undergone considerable redeposition. The si sherd should not be taken as an adequate indicat site age.

Site AT 24C

Site AT 24C is a sparse lithic and ceramic scatter v two loci, one with Basketmaker III pottery and the ot with Pueblo III/Pueblo IV sherds. It was given Laboratory of Anthropology site number LA 33939. site is located in Township 10N, Range 1W, Sectior and in Township 9N, Range 1W, Section 4. It lies at 5 feet (1614 meters) elevation on the Rio Puerco flo plain, about 300 meters west of that stream's pres channel. The site setting is a flat, sheetwashed p with sparse clump grass and grama cover. Occasic low shrubs were noted.

Survey and Testing

The site was described on survey as a pair of l separated by about 80 meters distance. The south locus had Lino Gray sherds, angular debris and secondary flakes. The northern locus had Los Lunas Smudged sherds but a lithic assemblage similar to that at Locus 1. Both loci had burned rock scatters. Each of the two loci was judged to cover about 400 square meters; the site had a 10,000 square meters dispersed area surrounding the two loci. The site was judged to be dislocated and scattered by sheetwash.

The site was tested on February 5, 1982. Testing was restricted to Locus 2 and to that portion of Locus 1 lying north of the Section 33/Section 4 fence line. Testing began by relocating loci and setting a datum point in each locus. The southern Locus 1 was then collected; artifacts were plotted by measurements from a 15 meters baseline extended north from datum, which was set at the fence line. Artifacts collected included 16 sherds, 23 flakes and a core (Map 2-20). Locus 2 and that portion of Locus 1 south of the fence were not collected.

Subsurface Testing

A transect of 40 centimeters deep shovel and auger tests was placed every two meters along the baseline in Locus 1. About ten additional shovel and auger tests were placed randomly in Locus 2. A retouch flake was found in the transect test at ten meters north of datum. It appears that additional auger tests were placed off the transect in Locus 1; an area of subsurface ash is mapped to the east of the transect in the center of the locus. The preliminary site description indicates that several of these tests produced ash, charcoal flecks, and flakes, but no collections were accessioned from auger tests.

Samples Analyzed

A total of 22 sherds was analyzed from this site; perhaps six of these were collected on survey. The analyzed sherds included Lino Gray (19 jar sherds), Lino/Tallahogan Red (one jar sherd), and Mineral/w (two jar sherds). No mention of Los Lunas Smudged is made in the specialist report (Warren and Warren, this volume); the survey identification of Los Lunas Smudged in Locus 2 clearly does not refer to the Lino Red sherd (FS #16), collected from Locus 1 during testing. The Lino Red was tempered with coarse subangular quartz. Two Lino Gray sherds were fully analyzed. One was tempered with dominantly sedimentary materials, and the other with mixed sedimentary and volcanic materials. Suggested locus of manufacture for both gray samples is in the Rio Salado area.

Comments

Locus 1 appears to be a sheetwashed Basketmaker III assemblage of undetermined function. The northern locus is not analyzable, given the available data; a Pueblo III/Pueblo IV component may be present.

Site AT 25C

Site AT 25C is a sherd and lithic scatter with two loci, both of which appear to date to the Basketmaker III period. It was assigned the Laboratory of Anthropology site number LA 33940. The site, like AT 24C 200 meters to the south, is located in Township 10 N, Range 1W, Section 33, on a featureless floodplain (Fig. 2-8) just north of the confluence of el Rio Puerco and la Canada del Ojo, at 5295 feet (1614 meters) elevation. The site is sheetwashed. Vegetation is sparse clump grasses, grama, and snakeweed.

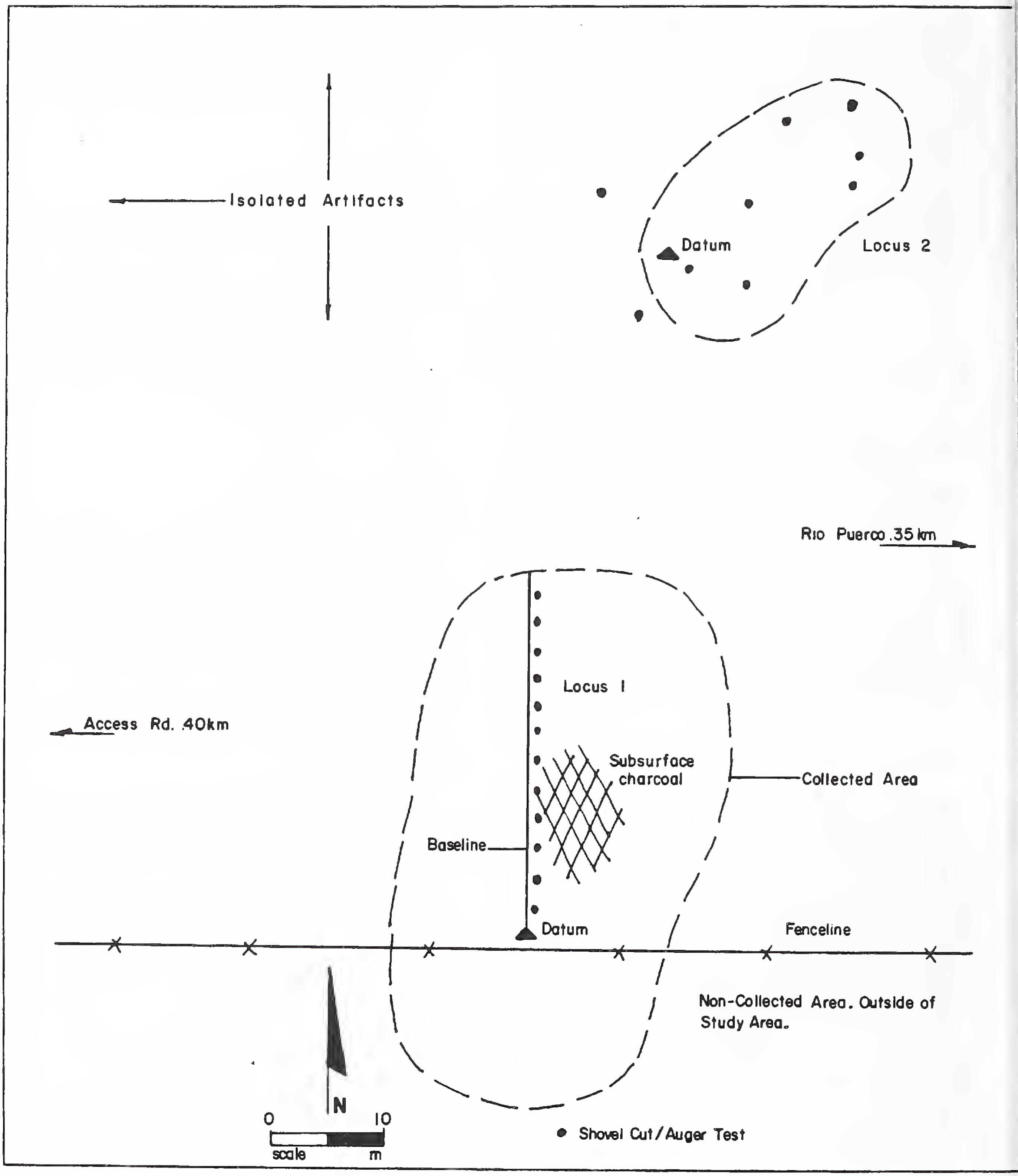
Survey and Testing

The site was described on survey as a scatter of debitage and burned rock, with at least one mano and one Lino Gray sherd associated. Flaked stone and a sherd were collected. The site was tested on February 8 and 9, 1982. Testing began with relocation and flagging of scatters. Two loci were defined, as on survey. Each locus was mapped. Baselines 30 meters long and 15 meters long, respectively, were extended north across Locus 1 and Locus 2 from datum points established at the southern locus margins. Artifacts within 15 meters to either side of these baselines were collected and grid-plotted. Artifacts lying outside the loci were point-plotted but not collected.

Shovel and auger tests were dug along both baselines at two meters intervals (Table 2-9). A test pit was excavated in each locus; pits were placed at 6-7 meters north of Locus 1 datum and at seven to eight meters north of Locus 2 datum. A feature was encountered in the Locus 2 pit; excavation was expanded horizontally to explore its extent. Both pollen and macrobotanical analyses were done on samples from this test pit. Two surface and shallow subsurface features were defined in the Locus 2 test pit.

Surface Description

Surface inspection revealed the presence of two extensive artifact scatters (Map 2-21). The first, Locus 1, contained 85 items of debitage, seven cores, an angular



Map 2-20. Site AT 24C artifact collection areas.

debris fragment, and a single sherd, all distributed over an area of about 1000 square meters of concentration. The second, Locus 2, lay about 110 meters east of Locus 1; it covered about 800 square meters of area. It contained (again) 85 items of debitage, a piece of groundstone, an angular fragment, and 30 sherds, but no cores. An additional six flakes and four sherds (not collected) were scattered across the area between and immediately to the north of the two loci. The area between the two loci was found to have a surface clay deposit, which may have obscured scatters connecting Loci 1 and 2.

Subsurface Testing

Testing began by excavation of shovel and auger tests every two meters along the baselines in Loci 1 and 2. Tests in Locus 1 were apparently dug to 50 centimeters depth, while tests in Locus 2 were dug to 30 centimeters depth. Results were as follows: in Locus 1, a flake was found in each of the tests at 6, 20 and 26 meters north of datum; one or more microflakes were found in tests at 12, 14, 18 and 22 meters north of datum, and both flakes and microflakes were found at 16 meters north of datum. In Locus 2, a flake was found in the test at ten meters north of datum, a sherd at 14 meters north of datum, and one or more microflakes at 0, 2, 4 and 6 meters north of datum (see Table 2-9).

Additional auger tests were placed at random in the clay deposits between the two loci. No data on the exact location of these are available. All were unproductive.

Test pits, 1.0 meters by 0.5 meters in size, were then excavated. Test Pit 1, in Locus 1, seems to have been sterile. Test Pit 2, in Locus 2, exposed a hearth, which was labeled as Feature 1 (Fig. 2-9). The feature was excavated, revealing one or two adjacent basin extensions to the east, which were labeled Feature 2 (Fig. 2-10). No plans or profiles of these features are available, but pollen and flotation samples from them were analyzed.

Samples Analyzed

Samples analyzed from AT 25C include ceramics, pollen, and flotation.

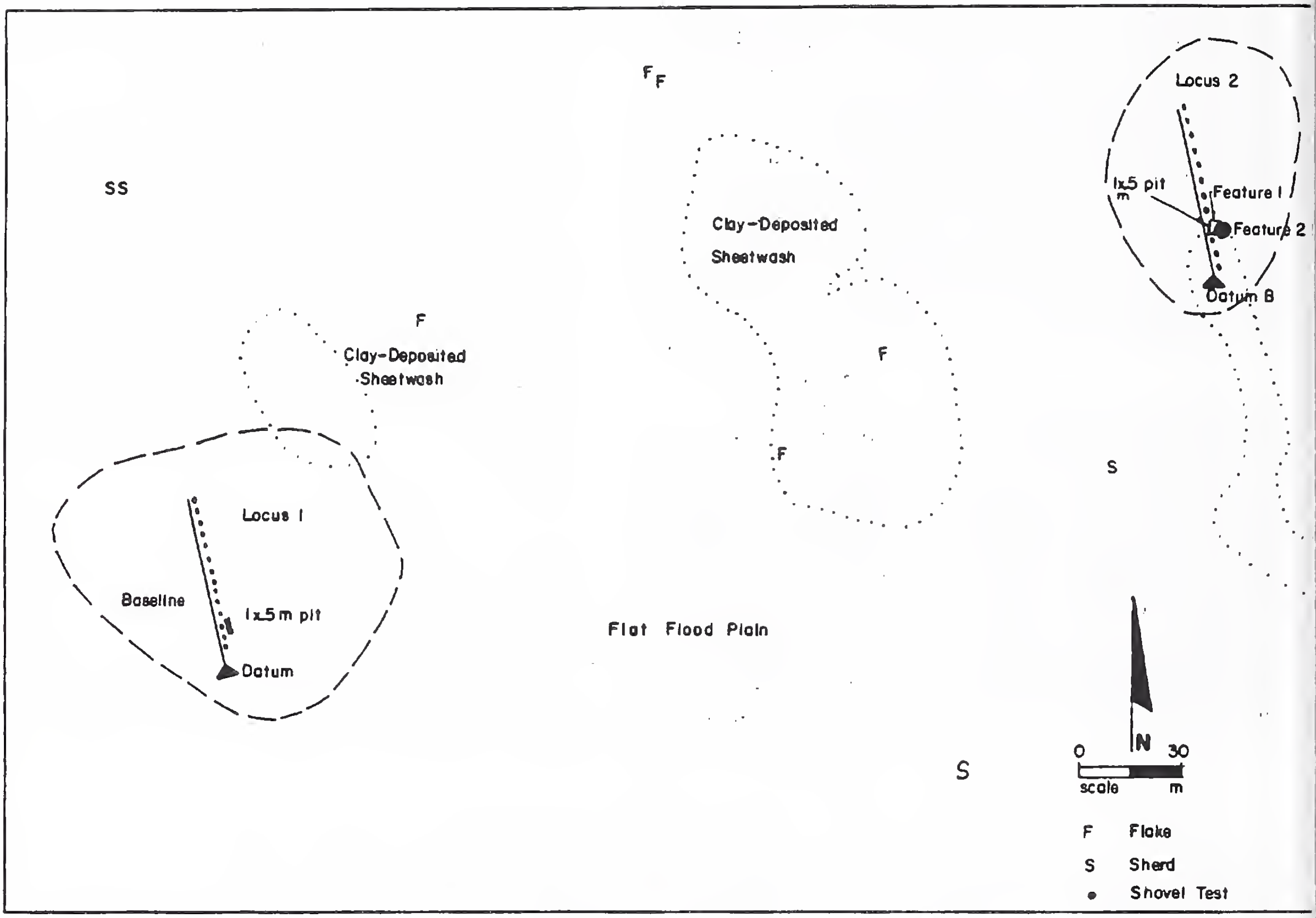
Ceramics analyzed (Warren and Warren, this volume) include all collections from the site. Thirty sherds were identified, and six sherds were studied further for tem-

Table 2-9. Site AT 25C, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Distance Datum	Bearing Bearing (m)	Depth Depth (degrees)	(cm)	Contents	To Bedrock?
Shovel Test 4	A	6.00	0	50	D	No
Shovel Test 7	A	12.00	0	50	D	No
Shovel Test 8	A	14.00	0	50	D	No
Shovel Test 9	A	16.00	0	50	D	No
Shovel Test 10	A	18.00	0	50	D	No
Shovel Test 11	A	20.00	0	50	D	No
Shovel Test 12	A	22.00	0	50	D	No
Shovel Test 14	A	26.00	0	50	D	No
Shovel Test 1	B	0.00	0	0 - 30	D	No
Shovel Test 2	B	2.00	0	0 - 30	D	No
Shovel Test 3	B	4.00	0	0 - 30	D	No
Shovel Test 4	B	6.00	0	0 - 30	D	No
Shovel Test 6	B	10.00	0	0 - 30	D	No
Shovel Test 8	B	14.00	0	0 - 30	S	No

Note: Sterile Tests not shown

Key: D - Debitage, S - Sherd



Map 2-21. Site AT 25C.

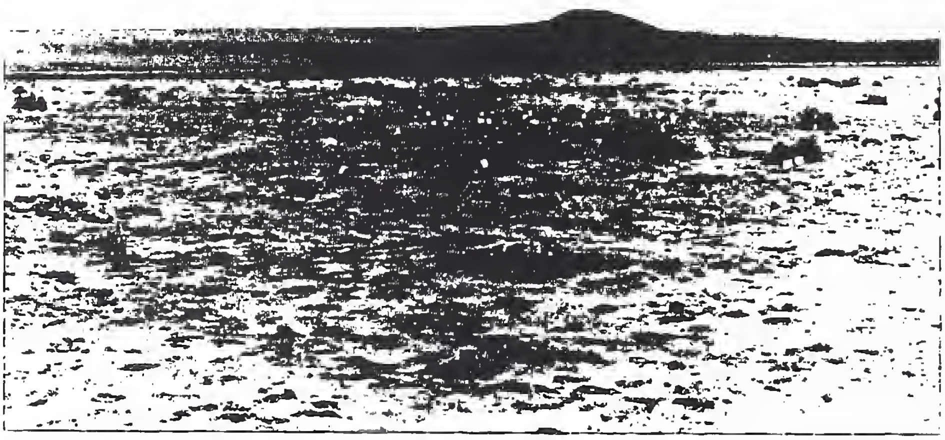


Figure 2-8. The site area and setting of Site AT 25C.

per and paste characterization. The assemblage included Early Kiatuthlanna/San Marcial B/w (one bowl sherd), Early Kiatuthlanna/La Plata B/w (one bowl sherd), unknown Mineral/w (one jar sherd), unknown whiteware (two jar sherds), and Lino Gray (25 jar sherds). The two Kiatuthlanna variants and the four Lino sherds all appeared to be of central-western New Mexico manufacture. Interestingly, the Lino sherds which were fully studied all exhibit the buff-to-red, hard, well-fired Anasazi paste which sometimes leads researchers to describe the commonly non-gray middle Rio Grande Lino Gray as "Lino Brown."

Pollen samples (Scott, this volume) are reported by the analyst to have come from the present surface and from Feature 1. However, the Field Specimen Catalog indicates that the "surface" pollen (FS #206) may actually have been an archeological sample from Feature 2. Both proved to have pollen frequencies similar to the control sample from AT 1A, except that the AT 25C samples both had relatively low grass pollen counts and the Feature 1 sample was high in corn pollen.

Macrobotanical flotation samples from Features 1 and 2 were analyzed (Toll, this volume). Both proved to contain only unburned weed seeds of species presently growing in the area.

Comments

Site AT 25C, Locus 1, has too few non-lithic diagnostics to allow its interpretation. It may, however, be associated temporally with Locus 2. Locus 2 seems to represent a single-component, late Basketmaker III occupation. Testing procedures were not sufficiently intensive to determine if the occupation was functionally specific or residential. Basketmaker III residential sites in this setting would probably be composed of deeply-buried pithouses, dispersed middens and a few indistinct and rather ephemeral surface features, such as the Feature 1 - Feature 2 complex actually found. Alternatively, any defensible functionally-specific site interpretation would probably be related to special-purpose farming activities. As no Basketmaker III "field houses" are known for this area, we are reluctant to speculate on the probable character, architectural or artifactual, of such an occupation. It is possible that Locus 2 is an example of such a site.

Site AT 27C

Site AT 27C is a concentrated lithic scatter with two loci; it appears to contain an unusually high proportion of small biface flakes. It has been given the Laboratory of Anthropology site number LA 33939. The site is located,

Figure 2-9. Site AT 25C, Feature 1.

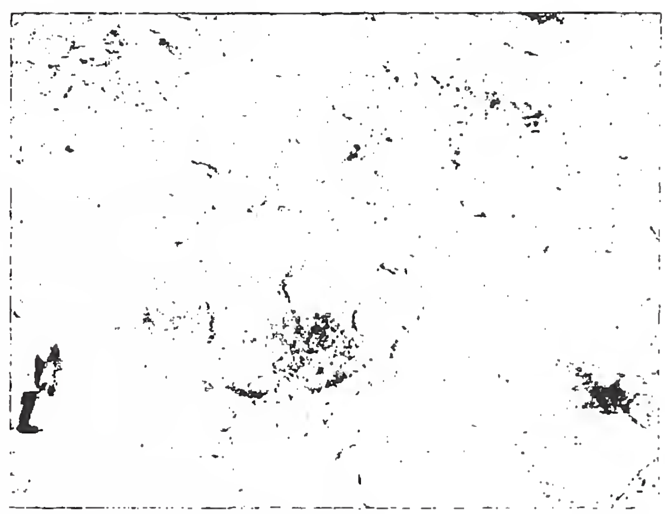


Figure 2-10. Site AT 25C, Feature 2.

like AT 24C and AT 25C, both a few hundred meters to the southeast, in Township 10 N, Range 1W, Section 33, on a featureless floodplain. It is just north of the confluence of the Rio Puerco and Canada del Ojo at 5305 feet (1617 meters) elevation. The site is sheetwashed. Vegetation consists of sparse clump grasses, grama, and snakeweed.

Survey and Testing

The site was described on survey as a small concentrated lithic scatter, composed mostly of silicified wood tertiary flakes. Possibly associated are one or more

Table 2-10. Site AT 27C, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Distance Datum	Bearing (m)	Depth (degrees)	(cm)	Contents	To Bedrock?
Shovel Test	A	2.00	0	0 - 30	D	No
Shovel Test	A	4.00	0	"	D	No
Shovel Test	A	6.00	0	"	D	No
Shovel Test	A	12.00	0	"	D	No
Auger Test	A	8.00	0	"	D	No
Auger Test	A	10.00	0	"	D	No

Key: D - Debitage

ground stone items some distance away from the small concentration, which extended across only ten square meters of area. The overall site, including outlying items, was judged to cover an area of about 200 square meters A uniface, one or more mano and metate fragments, and perhaps debitage, were collected. The site's research potential was not assessed.

The site was tested on February 9 and 10, 1982. Testing consisted of reflagging artifacts, determining the presence of two loci, establishing a datum in the southern edge of the northern locus, and mapping and photographing the site. A 15 meters baseline was then extended north from datum. All artifacts lying within ten meters to either side of this baseline were point-plotted and collected. Artifacts in Locus 2 were examined but not plotted or collected. Artifacts lying outside the concentrations were noted and plotted on the site map, but were not collected. A transect of shovel and auger tests was dug, with tests spaced along the baseline at two meters intervals (Table 2-10). Shovel cuts were dug to 30 centimeters or greater depth. Two test pits, each 1.0 by 0.5 meters in size, were dug. The southern test pit was placed in the center of Locus 2. It was dug to 20 centimeters depth. The northern test pit was placed between meter 7 and meter 8, on the west side of the baseline. It was dug to 40 centimeters depth. Fill was screened.

Surface Description

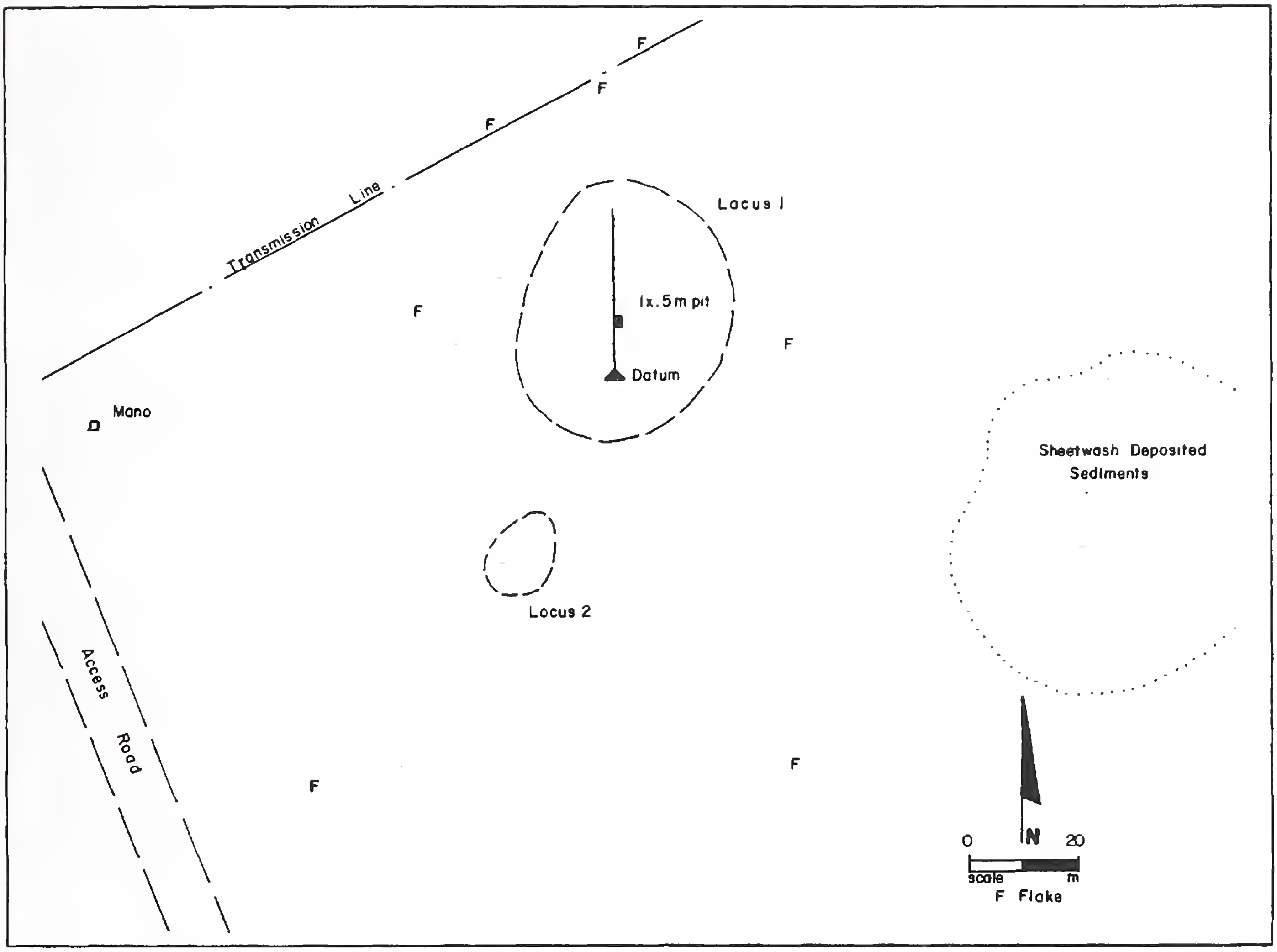
The site was found to consist of two aceramic loci (Map 2-22). The northern concentration, Locus 1, was found to contain an average density of one flake per square meter area, with peak densities of course being higher. A total of over 200 flakes, one angular fragment, one "lithic," and one possible core were collected (Table 2-10). Debitage was dominated by small tertiary flakes many of them heat-treated. Good-quality cherts and silicified woods made up the bulk of the collection. The locus extended over an area of about 500 square meters with sparser scatters extending over a much greater area.

Locus 2, about 20 meters to the south-southwest of Locus 1, was observed to contain densities, material types, and reduction stages similar to Locus 1. It was smaller, covering only about 80 square meters. If anything, the material quality in Locus 2 was judged to be superior to that in Locus 1.

Subsurface Testing

A total of at least six shovel and auger tests were dug to a depth of 30 centimeters along the transect in Locus 1. Results were dramatic. While the tests at 2, 4, 10, and 12 meters north of datum produced only one or two subsurface flakes apiece, the test at 6 meters produced over 20 flakes and the test at 8 meters produced about 25 flakes.

In order to evaluate the shovel and auger test findings, a 0.5 by 1.0 meter test pit was opened west of the baseline, with its southeast corner on baseline at 7 meters north of datum. This test produced about 50 flakes in the first ten centimeters depth, about 400 flakes in the second ten centimeters depth, and about 90 flakes in the third ten centimeters depth. The concentration of debitage seemed to be greatest at about 26 centimeters below surface. No artifacts were found in the fourth ten centimeters level. Ash and charcoal flecks were noted at about 15 to 26 centimeters below surface,



Map 2-22. Site AT 27C.

but no evident stratigraphy or featural indications were seen. The soil was very hard from about five centimeters to about 28 centimeters below surface (Fig. 2-11).

Although no collections were made from the general surface of Locus 2, a single 0.5 meters by 1.0 meter test pit was sunk in the apparent center of the locus. The surface artifacts disturbed by this test were collected; a total of 11 flakes was gathered. Excavation went down 20 centimeters in depth, in two ten centimeters levels. In the upper level were found three flakes and a few charcoal flecks. As in Locus 1, the soil was extremely hard below the surface dust. Neither artifacts nor stains were found in the second level, although a few small charcoal flecks were noted.

Samples Analyzed

No samples were analyzed from AT 27C.

Comments

Site AT 27C seems to be a remarkable example of lithic final-stage reduction. Perhaps this fact indicates that it should be viewed as Archaic or older. It is generally assumed that later sites do not exhibit such homogeneously late-stage debitage on such consistently good material types.

Site AT 28C

Site AT 28C is a lithic quarry and reduction site with associated burned-rock hearths and a few Basketmaker III sherds. It was assigned the Laboratory of Anthropology site number LA 33943. The site is located in Township 10N, Range 1W, Section 33, at 5290 feet (1612 meters) elevation. The site is set on the floodplain of the Rio Puerco, as is AT 25C, only 150 meters to the southwest. Vegetation is sparse grasses; lag gravels cover a portion of the surface locally.

Survey and Testing

The site was described on survey as a lithic site with a few associated Lino Gray sherds, lying in a single concentrated scatter of about 300 square meters area. Two clusters of burned rock were noted. These were inferred to represent hearths. The site was judged to be little eroded.

The site was tested on February 9, 10, and 11, 1982. Testing began by relocating the scatter. A datum was set in the southern portion of the concentration area. A 15 meters baseline was extended north from datum. All artifacts lying within 15 meters of the baseline were collected and piece-plotted. A total of eight shovel and auger tests were dug along the baseline, spaced at two meters intervals. Random shovel and auger tests and shovel scrapes were placed across the site, concentrating especially on the burned rock scatters. The tests in the northern scatter were mapped; it is thought that the southern scatter was tested as well.

Surface Description

The site was found to consist of a single artifact scatt roughly circular in plan, and covering about 10 square meters of area (Map 2-23). Two scatters burned rock were noted. Each was about five meters maximum extent. The rock scatters lay roughly in t north-central and the southeastern site areas. Neitl ash nor charcoal was found clearly associated w these burned rocks. A patch of large lag cobbles a gravels underlay the site in the northeastern quarter, included knappable materials.

Artifacts collected from the surface included about 1 flakes, four cores, two chopper/pebble tools, hammerstone, five sherds, and an arrow point of obs ian. Debitage included primary, secondary, and tertia stages, with many small retouch flakes. Chalcedon and silicified woods were the most common mater types. No obsidian, other than the point, was found

Subsurface Testing

Testing the subsurface was carried out using shovel a auger tests. A series of seven shovel and auger tes were dug to 30 centimeters depth at two meters interva along the baseline. All tests produced debitage in sm amounts; the test at eight meters north of datum pr duced the greatest quantity and variety, with abo three flakes, four microflakes, and a limonite samp Most items were found in the upper 20 centimeters of fi Shovel scrapes and auger tests in the areas of burn rock found no burned soil, ash, or charcoal.

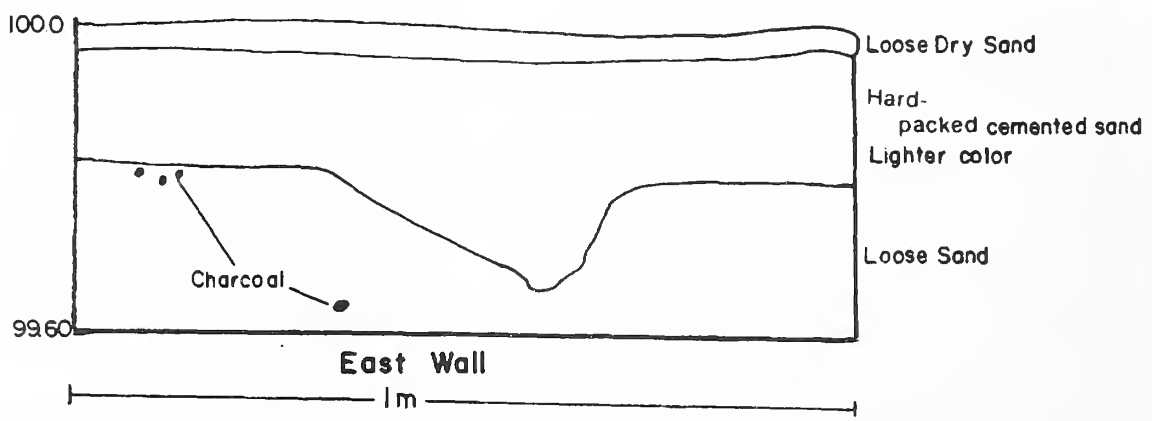


Figure 2-11. Test Pit profile of Site AT 27C.

Samples Analyzed

Samples analyzed from this site include two surface-collected obsidian hydration specimens and five ceramic items (Warren and Warren, this volume). Of the ceramics, two jar sherds of Lino Gray, two jar sherds of plain brownware, and a bowl sherd of undiagnostic Mineral/w were identified. The Lino sherds and one brownware sherd were found to contain paste and temper characteristic of the Rio Salado district to the southwest of the study area. It was the analyst's judgement that the whiteware and brownware could easily be Basketmaker/early Mogollon products, suggesting a Basketmaker III date for the site.

Two obsidian samples were submitted for hydration rind determination to the U.C.L.A. Obsidian Hydration Laboratory. Both items were surface-collected; neither was objectively sourced. Following the methods outlined in discussion of obsidian samples for AT 15C (see that section), the samples were assigned to sources by the author. Sample 20.1, a small corner-notched arrow point, was judged to be Jemez obsidian but was not further identifiable by inspection. Calculations based on the slowest-hydrating and fastest-hydrating Jemez obsidian types indicate that the point (rind thickness of 3.1 microns) probably dates somewhere between 802 B.P. and 1533 B.P. (based on Polvadera and Cerro del Medio rates, respectively). This is an acceptable range based on Bertram's (1987) comparative sample and Thom's (1977) typological review. Both sources would further support the typological inference that the point's actual age is probably Basketmaker III-Pueblo I. That implies that the material source was Cerro del Medio or one of the two as-yet-unlocated sources reported by Michels (1984b, c) under their Warren designations as Types 3500 and 3523.

The second item, a flake of opaque vitrophyric obsidian, seems to represent an error. It was assumed that the sample was composed of the rapidly-hydrating Pumice Mountain vitrophyre. Under this assumption, the flake, which exhibited only one-half micron of hydration, would have been struck only a decade ago. Similar problems were noted above in dating of vitrophyre items from AT 3B and AT 15C, perhaps suggesting either that a second, very-slowly-hydrating vitrophyre source remains to be discovered or else that some technical problem may be producing many wrong hydration birefringence measurements for Pumice Mountain artifacts (see Batcho (1984) for the only published examination of hydration dating for a large sample of this material).

Comments

This site would seem to be a deflated or washed late Basketmaker quarry, tool production, and camp site. More complex occupation remains, such as pithouses, could easily have been masked by the floodplain deposits. The lithic assemblage should be carefully compared with those of nearby Basketmaker and possible Archaic sites, such as AT 25C and AT 27C.

Site AT 29C

Site AT 29C is a lithic scatter with associated Basketmaker III and early Pueblo sherds, groundstone, and a burned rock scatter. It was assigned the Laboratory of Anthropology site number LA 33944. The site is located in Township 10N, Range 1 W, Section 33, at 5295 feet (1614 meters) elevation. The site is set on the Rio Puerco floodplain; it lies 400 meters northwest of AT 28C. Local slope is nil; the site has suffered sheetwash erosion and cattle trampling. Vegetation is sparse clump grasses and snakeweed. A currently-used windmill lies a few meters north of the site.

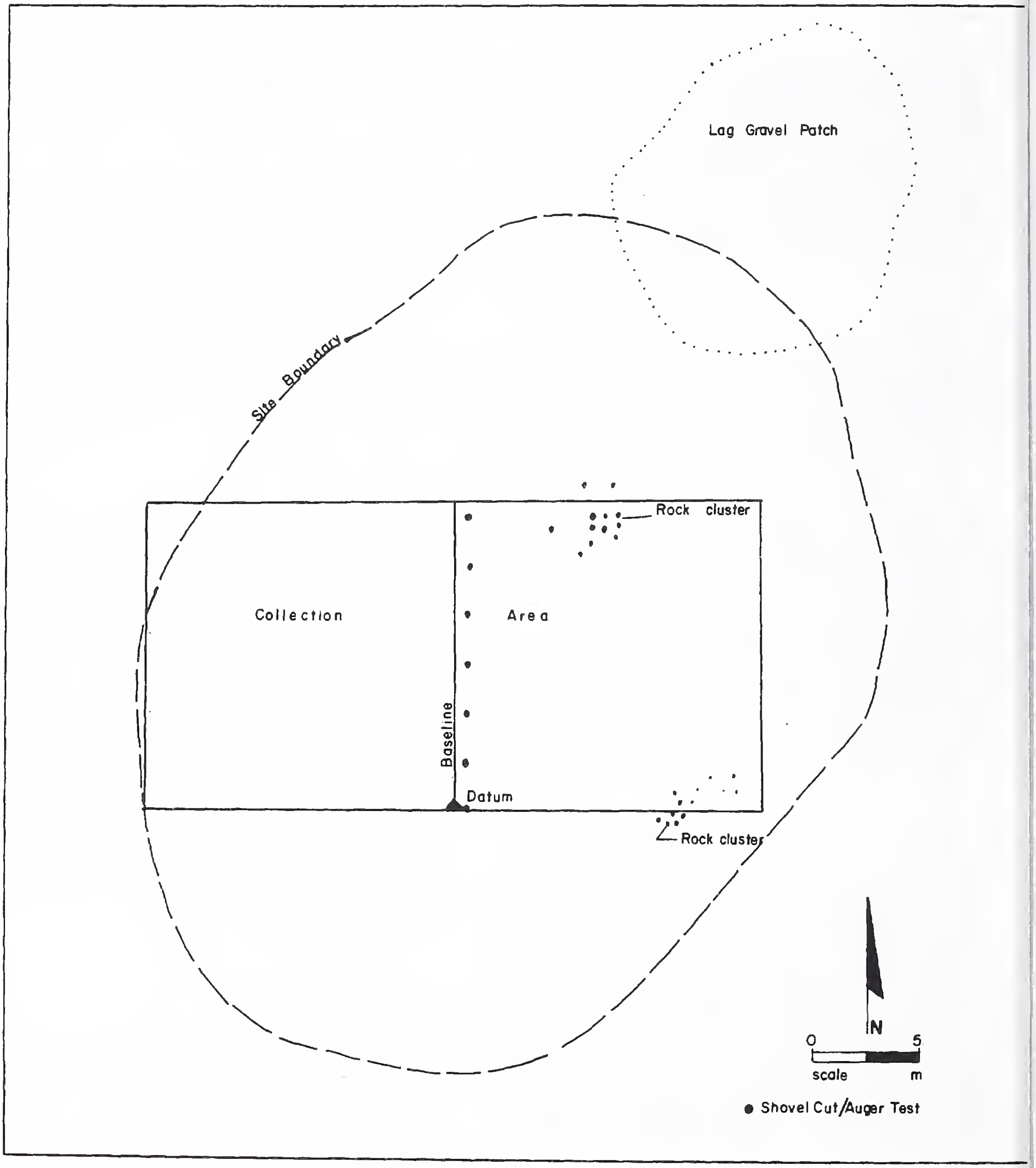
Survey and Testing

The site was described on survey as a lithic scatter having angular debris, a core, flakes and a maul, with an associated burned rock scatter and a few Lino Gray and Red Mesa B/w sherds. The site was estimated to have a core area of 100 square meters, with a dispersed area of 4000 square meters in all. The site condition was judged as good.

The site was tested on February 10 to 12, 1982. Testing consisted of site location, artifact flagging, setting a datum in the single concentration found, and laying a 15 meters baseline north from datum. All artifacts within 15 meters on either side of the baseline were then point-provenienced and collected. Shovel and auger tests were then placed along the baseline at two meters intervals; these cuts were 30 centimeters deep. Additional shovel and auger tests were placed at random around the site. Shovel scrapes were carried out in the area of burned rock.

Surface Description

The site was found to be as described on survey (Map 2-24), except that no Basketmaker III utility sherds could be located. The utility sherds found were all from neck-banded jars, which could be confused easily with Lino Gray sherds if not closely inspected. A total of about 50 sherds were surface-collected, along with about 45 lithics, a two-handed mano, a pecked maul, and a piece of groundstone. A metate fragment and a hammerstone may also have been collected. Debitage was dominantly of secondary and tertiary flakes of local silicified woods and chalcedonies. Several cores were included in the



Map 2-23. Site AT 28C.

bulk lithic count. A scatter of burned rock fragments extended over an area of about 15 square meters just southwest of datum.

Subsurface Testing

Auger tests produced subsurface cultural materials at two locations. The test at six meters north of datum recovered two flakes, and the test at ten meters recovered a single microflake. No other subsurface cultural indications were recorded.

Samples Analyzed

Analyzed ceramic samples from this site include 52 sherds, of which ten were studied to determine paste and temper. Pottery included Late Kiatuthlanna B/w (two bowl and six jar sherds), Red Mesa B/w (one jar sherd), Unidentified Mineral/w (two bowl and 11 jar sherds), Tohatchi Banded (25 jar sherds), plain whiteware (two bowl and two jar sherds), and an unidentified bowl sherd. One of the Kiatuthlanna bowl sherds might as easily be classified as La Plata B/w on the basis of temper size. Temper and paste study indicated a Red Mesa Valley, Lobo Mesa, or Rio Salado source for all samples examined. Ceramic dates imply an occupation or occupations between A.D. 850 and A.D. 1250; as noted above, there is reason to suspect that Tohatchi Banded may date even earlier by perhaps a century.

Comments

This site appears to be a multiple component special purpose site. The setting and the utility/decorated ratio of 1:1 suggest that the site does not consist of only a field house or field site; such sites tend to have higher utility/decorated ratios (Raish n.d.). Testing as carried out could easily have failed to detect pit structures or buried jacal remnants; these cannot be ruled out for AT29C.

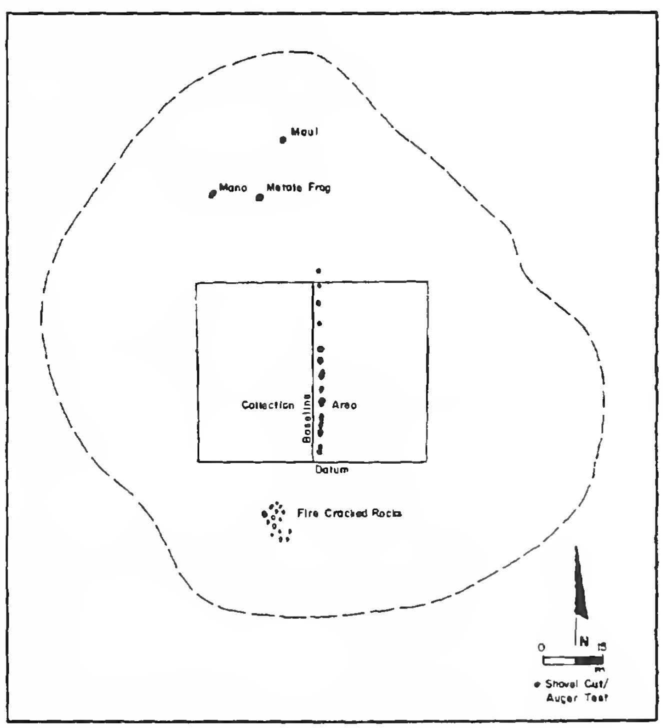
Site AT 31C

Site AT 31C is a sherd and lithic scatter with features and associated midden. It has been assigned the Laboratory of Anthropology site number LA 33943. The site is located on a gravel ridge which extends out into the Rio Puerco floodplain, in Township 10N, Range 1W, Section 33, at an elevation of 5310 feet (1618 meters). The Rio Puerco flows 100 meters to the east. The site directly overlooks sites AT 24C, 25C, 26C, 27C, 28C, and 29C, all of which lie within one kilometer to the south. It commands an overview of the Rio Puerco and Canada del Ojo floodplains and the nearby slopes of the mesas to either side of the valleys. It is set on sandy soils having abundant pebbles. Local vegetation is sparse and dominated by low shrubs, including mormon tea, snakeweed, salt bush, and introduced weeds, with occasional grasses. The site is undergoing erosion.

Survey and Testing

The site was described on survey as a scatter of sherds and lithic debris with three associated ash and charcoal stain features. The site was estimated to have a core area of about 200 square meters and a dispersed area of about 1000 square meters. About 12 sherds of Lino Gray were collected. The site was judged to be in good condition. Informal assessment was that research potential was good.

The site was tested on February 17-19, 1982; additional work may have been done on August 9, 1982. Testing consisted of site relocation, pin-flagging, and feature definition. A datum was established to the south and east of the major ash concentrations and artifact scatter. A 30 meters baseline was extended northwest of datum across the scatter. Artifacts within 15 meters to either side of baseline were collected and their coordi-



Map 2-24. Site AT 29C.

nates recorded. The northwest trend of the baseline was defined as "north" for the site. Additional formal tools and ceramics were collected and their coordinates recorded by compass-and-pace mapping.

Three features were designated as Feature 1 (center at 18.5N/7.5E), Feature 2 (center at 20.0N/0.5E), and Feature 3 (center at 12.0N/5.0E). Each of the three was described as having a diameter of about one meter. The site testing map (Map 2-25) indicates different locations and characteristics for the features, approximately as follows: Feature 1 (12N/8E, diameter of three meters), Feature 2 (25N/2W, diameter of three meters), and Feature 3 (extending from 0N/15E to 18N/40E, oblong, ten meters wide). Shovel and auger tests were dug along the baseline every two meters, with screening of fill (Table 2-11). Test pits were dug in Feature 1 (1.4 meters by 0.5 meters) and at a positive auger test at transect meters 22N-23N (1.0 by 0.5 meters). The latter pit was labeled Test Pit 1. It is logged in the photo file as lying at seven meters north of datum, but this appears to be incorrect.

Surface Description

The site was found to be as described on survey, except that the Feature 3 stain was apparently much larger than originally indicated. Also, the survey description had placed the site on the east slope of the ridge; testing work indicated that the site lay atop the ridge. The surface assemblage within the artifact scatter consisted of about 160 sherds, 255 items of debitage, five cores, a possible core, five large angular fragments, two choppers, six hammerstones, six manos, two metates, three groundstone items, two shell beads, a shell pendant, a scraper, two bifaces, and a retouched flake. Almost all of these items were collected from within the 900 squ meters Cartesian grid collection unit. The indica artifact density within the grid, therefore, was about items per square meter on average.

Subsurface Testing

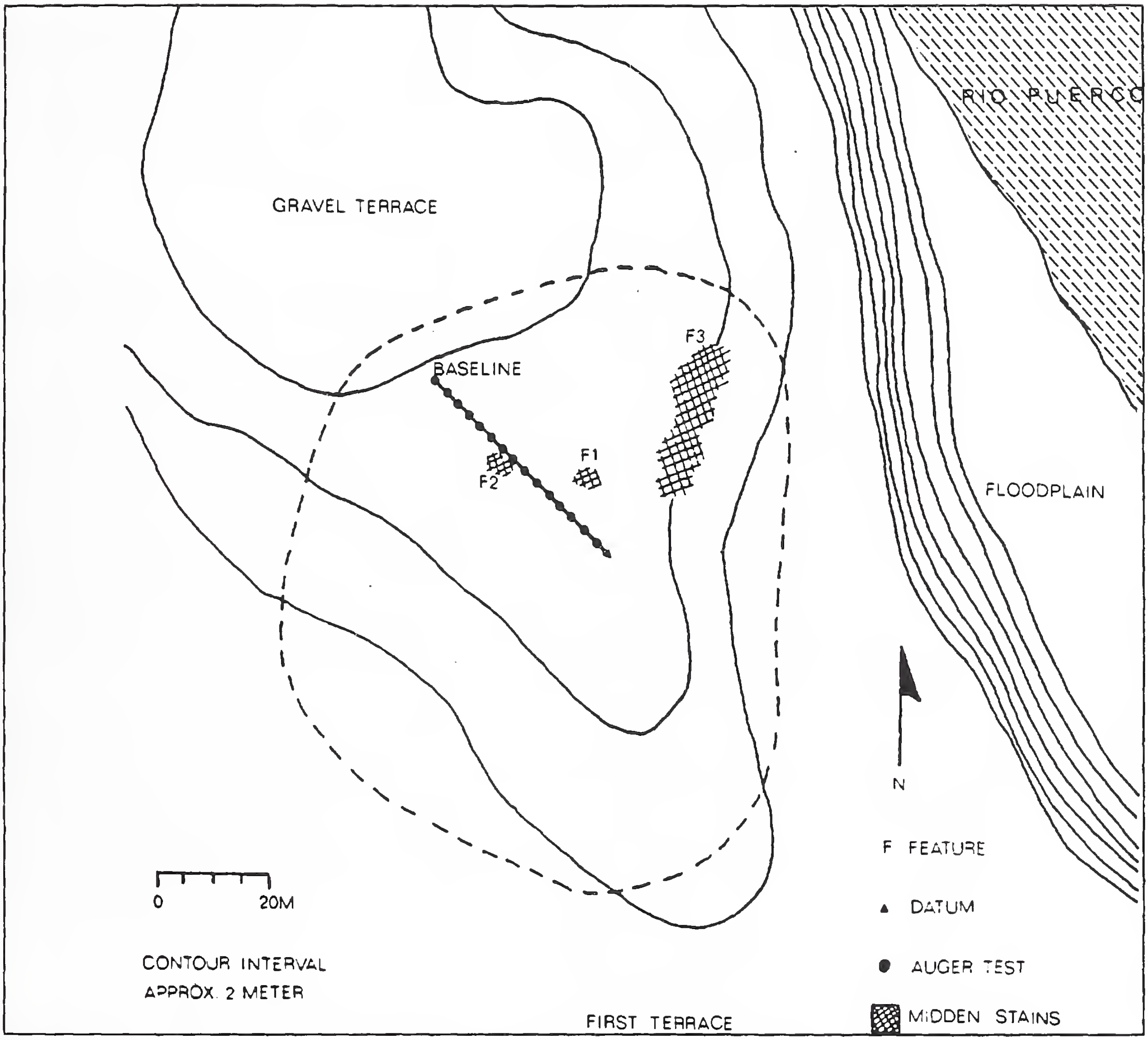
Auger tests dug at 2 meters intervals along the basel were unevenly productive (Table 2-11). Sherds w found in the tests at 18, 22, 26, and 28 meters nortl datum. Debitage was found in tests at 4, 6, 16, 18, a 22 meters north of datum. All other tests were app ently sterile. Tests were dug to a depth of 30 centimet except for the test at 22 meters north; it was dug to centimeters depth. A charcoal sample was recove from 30 to 60 centimeters depth in this test.

A test pit was opened at 22-23 meters north. Excava to a depth of 65 centimeters, it produced six sherds a six flakes, together with charcoal flecking, in the first centimeters of depth. In the second ten centimet level, flecks of charcoal and three flakes were fou Vague stains were found in the third level, but artifacts were recovered. The test thereafter was ster Stratigraphy of the upper fill (Stratum A, at 0 to centimeters depth) was described as loose, fine sa with intermixed pebbles and grass roots. The under ing soil (Stratum B, at 25 to 45 centimeters depth) w described as more compact than Stratum A, with fev pebbles, and having clay lenses and lumps distribu throughout. The lowest soil unit (Stratum C, at 45 to centimeters depth) was described as loose, clean sa with gravel intermixed. This unit was so poorly co pacted or cemented that an auger test was not possil due to collapse of the soil column.

Table 2-11. Site AT 31C, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
Shovel Test 1	A	4	270	?	S	No
Shovel Test 2	A	6	360	0-30	D	No
Shovel Test 3	A	16	360	0-30	D	No
Shovel Test 4	A	18	360	0-30	D,S	No
Shovel Test 5	A	22	360	0-30	S	No
Shovel Test 5	A	22	360	40-60	C,D	No
Shovel Test 6	A	26	360	0-30	S	No
Shovel Test 7	A	28	360	0-30	S	No

Key: C - Charcoal, D - Debitage, S - Sherds



Map 2-25. Site AT 31C testing locations.

Feature 1 was described as an apparent hearth stain about one meter in diameter. It was excavated in section, with the west half only being removed. As excavation proceeded, the stain was found to extend at depths of 50 centimeters for another 40 centimeters to the north. It was interpreted as a buried midden deposit and not a hearth. No stratigraphic data are available.

Artifacts and samples removed from Feature 1 included ceramics, debitage, shell, bones, and charcoal, and flotation and macrobotanical samples.

Samples Analyzed

Samples analyzed from AT 31C included 217 sherds (Warren and Warren, this volume), one radiocarbon sample, a flotation sample and a corn cob (Toll this volume). There were also three seashell beads, a fossil shell, and 150 bone items (Bertram this volume).

One radiocarbon sample from the subsurface contents of Feature 1 was submitted to the University of Texas at Austin. It was dated at 1530 ± 50 B.P. (TX-4800, A.D. 385 to A.D. 610 with midpoint at A.D. 500 according to the Klein et al. [1982], 95% confidence tables).

Sherds analyzed included identified plainwares: Lino Gray (five bowl and 146 jar sherds), Lino/Tallahogan Red (one jar sherd), Lino Smudged (28 jar sherds), Lino Polished (one jar sherd), Alma Washboard (one jar sherd); unidentified plainwares: polished redware (two jar sherds), smudged brownware (two jar sherds), and plain unidentified type (eight jar sherds). Decorated wares included: San Marcial B/w (11 bowl and seven jar sherds), unidentified whiteware (two jar? sherds), and Socorro B/w (three jar sherds). All but the Socorro jar sherds could date to the early Basketmaker III period, and are thus not inconsistent with the radiocarbon date.

Of the sherds studied, about 40 were further analyzed for paste and temper characteristics. This analysis indicated that the Anasazi (Lino), Mogollon (Alma), and Mogollon-Anasazi (San Marcial) items all were probably made in west-central New Mexico, in an area stretching from the Alamocito drainage north to the San Mateo drainage.

Flotation was carried out on a sample from Feature 1. The results indicated that charred goosefoot and corn were present. Analysis of a corn cob indicated that it was of a 12-row variety, having relatively small seeds. It had a diameter no larger than the 8-row and 10-row cobs from AT 15C. Charcoal was also recovered. It proved to contain about equal parts of juniper and saltbush, with traces of greasewood. This last observation raises questions about the quality and correlation of the radiocarbon date. If the date is based on juniper, then it is appropriately calibrated. If it is based mainly on saltbush, it is probably incorrect by as much as 10% to 20% (Syvertsen et al. 1976) due to the differential uptake rates of C_{12} and C_{14} in juniper (a typical plant) and saltbush (an atypical plant).

Bone and shell were collected from both surface and subsurface proveniences. Surface collections produced a jackrabbit shoulder element (weathered) and three pieces of oceanic shell jewelry, all from species common in Gulf of California/Sea of Cortez collections. These were a pendant cut from a piece of Greater Olive shell, incised with a geometric or abstracted landscape design, and two Lesser Olive shell beads. Also collected was a locally common fossil shell, which was not further identified.

Subsurface bone included reasonably well-prese remains of two to three adult jackrabbits, a young an adult cottontail, and an adult wood rat. Elemen all the lagomorphs and perhaps of the wood rat exhib probable roasting, but actual burning was rare. amples of most body parts were present for t cottontails and jackrabbits.

Comments

This site appears to represent a relatively homogene Basketmaker III ceramic assemblage with consis ornament, faunal, and floral associations. The ex shells are not surprising; they are even relatively c mon in late Archaic and Basketmaker II sites, especi as burial associations. The 12-row corn may be an e record for that variety, which is at most periods common than 8-row varieties of the Harinoso del O group. As is typical of Albuquerque-area Basketma III and Pueblo I sites, the dominantly Anasazi cera assemblage is associated with rare Early Pithouse riod Mogollon pottery. The decorated San Marcial I is properly neither a Mogollon nor an Anasazi ware was made/traded widely in the Early Formative ac a region which students have come to call the "Mogos province, because its assemblages and architecture neither all Mogollon nor all Anasazi in style, produc techniques, or other characters.

Site AT 31C is best described as an Early Formativ Basketmaker III site, probably with undiscovered r dential components and certainly with rich mid remaining in place. The intrusive Pueblo II/Puebl pottery is rare and not unexpected; it almost certa does not indicate significant multicomponency. radiocarbon date is not unreasonably early, also s gesting the presence of only a single temporal compon

Site AT 35C

Site AT 35C is a lithic scatter concentrated in around a dune blowout. It was assigned the Laborat of Anthropology site number LA 33947. The sit located in Township 9 North, Range 1 East, Section at an elevation of 5645 feet (1721 meters). It is set o dune which caps a ridge running down the upper Ll de Albuquerque Ceja escarpment. The site overlooks Rio Puerco floodplain. It was undergoing wind eros when found, and was exposed mostly within a blow Vegetation was limited to sparse grasses.

Survey and Testing

The site was described on survey as a lithic scatter w projectile point tips and at least one mano associated was exposed within a blowout on the crest of a dune and also down the southern dune slope. The site was estimated to contain a 400 square meters core area and perhaps 8000 square meters of dispersed area. Debitage was mostly composed of retouch flakes. A projectile point distal fragment was found; its form and size suggested an Early to Late Archaic age for the site. The recorders suggested that a PaleoIndian component might also be present.

The site was tested on December 23 and December 28 through 31, 1981, and also on January 4, 1982. Testing was begun by relocating the site and setting a datum on the dune crest to the south of the blowout (Map 2-26). A 0.5 by 14 meters grid of collection units was laid down running across the blowout at a bearing of either 102 degrees east of north or else of about 135 degrees east of magnetic north. Examination of terrain and photographs (Fig. 2-12) indicate that the heading of 102 degrees is probably correct.

The grids were numbered sequentially from the west end as Grids 1-14. All items found within the 1 by 0.5 meters grid cells were collected. All formal tools on the site were collected; locations were recorded by transit and tape/pace measurement. Grids 4, 7, and 12 were then excavated to depths of up to 90 centimeters. Eight or nine auger tests (Table 2-12) were replaced at random along the southern crest of the blowout and in the next adjacent blowout to the west. On the basis of findings from these tests, five additional 1 by 0.5 meter grids were laid out as a test trench on the southern crest of the blowout. These were numbered from north to south as Grids 15-19, and were excavated to depths of up to 50 centimeters. Three more 0.5 by 1.0 meter units were laid out running along the southern crest of the blowout. These units, labeled from west to east as Grids 20-22, were excavated to depths of up to 50 centimeters below surface. Finally, a one by one meter test pit was dug in the western floor of the blowout. This unit, Grid 23, was dug to 25 centimeters depth to evaluate an ash stain.

Surface Description

The site was found to consist of hundreds of small and larger flakes clustered within a shallow blowout measuring about 25 meters long (E-W) by about 15 meters wide (N-S). From within the 14 collection units on the blowout floor, 205 artifacts were collected. Maximum density was reached in Grid Unit 7, where about 76 chipped stone items and a ground stone item (over 150 items per square meter) were recorded and collected. About 30 formal tools, accessioned as "Artifacts" but not further identified, were collected from the general site area by the bearing-and-distance method of plotting.

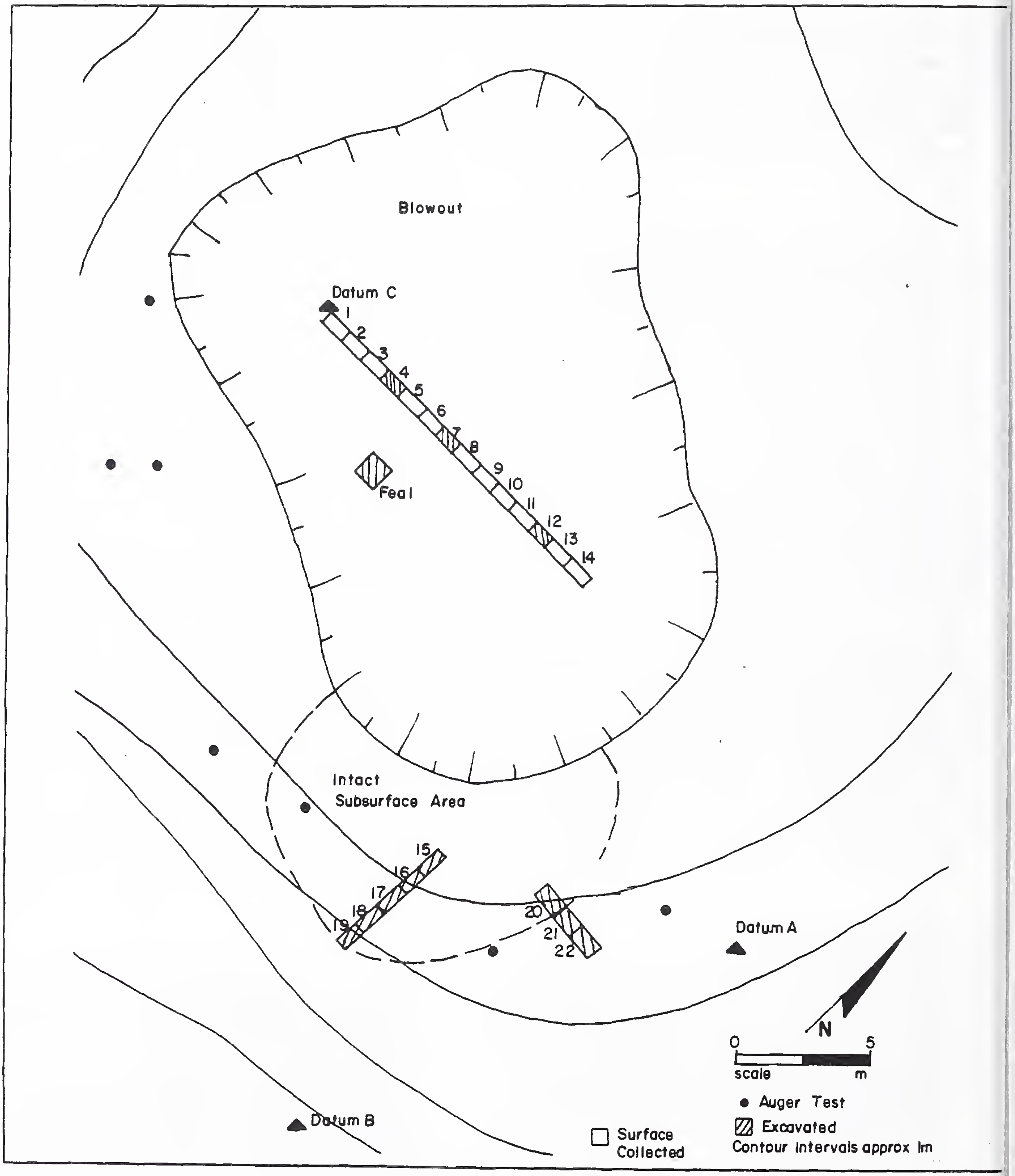
Subsurface Testing

Subsurface testing was extensive on this site. Initially, test units were dug within three grid collection units selected because they had produced maximum (Unit 7), minimum (Unit 4), and modal (Unit 12) surface artifact densities.

Grid 4 was dug in four ten centimeters arbitrary levels. The first level produced 61 flakes, but later levels produced only subfossil snail shells. Grid 7 was dug in nine 10 centimeters arbitrary levels. The first level produced over 300 debitage pieces, including many small flakes lost through the 1/4" screen. Later levels produced steadily less debitage; by Level 4, only four flakes were noted. In Level 5, one flake was found. Deeper levels were sterile, except for the charcoal flecking noted at all depths. Grid 12, dug in six 10 centimeters levels, was somewhat surprising; 545 flakes were found in the first level, but only six flakes in the second level. Later levels produced one or two flakes, all of which may have blown in from the surface. A pebbly underlying stratum was found at 80 centimeters depth in Grid 7 and at 50 centimeters depth in Grid 12, but was not reached in Grid 4.

About eight auger tests were dug in the southern and southwestern dune crest. An additional test was placed in the adjacent blowout lying to the northwest. It seems that no collections were made from these tests, but artifacts were encountered. The test (Test 2) at 250 degrees and seven meters from datum may have netted a flake. The test (Test 3) at 267 degrees and 9.2 meters from datum produced three flakes. The test (Test 4?) at 265 degrees and 18 meters from datum produced a bone item. The test (Test 5?) at 22 meters and 263 degrees produced a flake.

Figure 2-12. The general site area of Site AT 35C.



Map 2-26. Site AT 35C.

Table 2-12. Site AT 35C, Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
Auger 1	A	4.2	288	na	-	No
Auger 2	A	7.0	250		-	No
Auger 3	A	9.2	267		D	No
Auger 4	A	15.0	275		-	No
Auger 5	A	18.0	265		B	No
Auger 6	A	22.0	263		D	No

Key: B - Bone, D - Debitage

To evaluate the deposits encountered in augering, a second set of test pits was dug. These were designated as Grids 15-19. Grids 15-19, each 0.5 by 1.0 meter in size, were laid out to the west of datum, oriented N-S, and numbered from north to south (Fig. 2-13). Grid 15 was dug in five 10 centimeters levels. Level 1 produced 2 flakes, Level 2 produced 23 flakes, and Level 3 produced 90 flakes. A harder subsurface was encountered in Level 3; only one flake was found in about 25 centimeters of excavation into this stratum. Grid 16 was dug in four 5 centimeters levels; it produced 70 debitage items from Level 3, at the bottom of which the hard surface was encountered. The unit was thereafter essentially sterile.

The hard sterile layer was close to the modern surface in Grid 17; only 16 flakes were found in the first 5 centimeters of excavation and only 12 items thereafter. The sterile substrate seemed to slope strongly down to the south in this unit and in Grid 18, where few artifacts were found. In Grid 19, the first two 5 centimeters levels were sterile, but the third level produced a flake and a biface. The fourth level produced 18 flakes; the fifth level produced eight flakes and a broken cobble which had been burned. The sterile substrate dipped rapidly to the south here. It was composed of pebbly, calichified sand. Apparently, most of the artifacts from these units came from directly on the sterile hardpan (Grids 17, 18, and 19) or from perhaps ten centimeters above it (Grids 15 and 16).

In order to gain more samples from the possible occupation surface defined in Grids 15-19, three adjacent test pits, each of 0.5 by 1.0 meters size, were laid out. These units, numbered as Grids 20-22 from west to east, were laid out along the crest of the blowout to the east of Grids 15-19. These units were dug in five and ten centimeters levels to depths of 50, 30, and 20 centimeters, respectively.

Grid 20 produced three flakes in the first level, 45 flakes and a piece of burned rock in the second level, and 10 flakes in the third level. Levels 4 and 5 encountered sterile substrate deposits which were indistinguishable from the overlying cultural layer except for their greater compaction. Grid 21 produced four flakes in Level 1, two flakes in Level 2, and 28 flakes with more burned rock in Level 3. Thereafter, sterile soil was encountered in Level 4; in this unit, no differences between the sterile and the overlying cultural layers could be discerned. In Grid 22, excavation was extended only down into the rich cultural layer; a total of 14 flakes was found. The unit was then abandoned.

Grid 23, a one by one meter test pit, was excavated just to the south of Grid 6. It was placed to evaluate an ash-charcoal stain which was exposed by wind erosion while excavation was in progress. A single 10 centimeters level followed by three 5 centimeters levels were dug. The results were disappointing. The first level produced about 25 flakes and only flecks of charcoal. The second level produced about five flakes and more fine, dispersed charcoal. The third level produced only one flake; as with most test pits on this site, it also produced occasional charcoal flecks. The fourth level was sterile.

Samples Analyzed

Neither chronometric nor inferential dating samples were obtained from this site. No botanical specimens were collected. Although an auger test encountered bone, the specimen was not collected.

Figure 2-13. Grids 15 through 19, Site AT 35C.

Comment

The testing results appear to demonstrate that a rich aceramic lithic assemblage lies in situ in the sandy soils just above a variably-definable hardpan substrate. No further inferences are possible at this time.

Site AT 36C

Site AT 36C is a lithic site with a possibly intact living surface, exposed in a dune blowout. It was assigned the Laboratory of Anthropology site number LA 33948. The site is located in Township 9 North, Range 1 East, Section 18, about 275 meters southwest of site AT 35C. The site appears to be essentially identical in setting, surroundings, and surface character to AT 35C; it is, of course, slightly lower, at 5620 feet (1712 meters) elevation.

Survey and Testing

The site was apparently first discovered and recorded January 4, 1982, after the testing program had begu It was described as a dense scatter of debitage a burned rock with associated groundstone, having single artifact concentration extending over 200 squa meters area and a dispersed scatter of 800 squa meters area. The site was found within and down t slopes of a shallow blowout eroding into a low ridge-t coppice dune. The site was judged to be relatively inta within the dune. Both chipped stone and groundsto were apparently collected.

The site was tested on January 5 and 6, 1982. Testi procedures essentially replicated those employed at 35C. The site scatter was pinflagged. A datum w established on the dune crest south of the blowo Based on this point, the site was mapped (Map 2-27). grid collection transect nine meters long and 0.5 mete wide was laid out at 114 degrees east of true nort across the blowout concentration. The collection uni thus defined were labeled as Grid Units 1-8, number from northwest to southeast. All items found in the gri were collected. Formal tools lying outside the grid we collected; provenlencing for this collection was by ang and distance from datum.

Six auger tests were dug. These were placed in a curv transect, at intervals of about ten meters apart, on t dune surface around the south end of the blowout. Gr Units 4 and 7 were excavated. Then a second test gr system was established on the southeast side of t blowout, on the margin of the dune crest. Along a fi meters baseline, oriented north-south, a set of fo contiguous 1.0 by 0.5 meters units were laid out. The were numbered from north to south as Grid Units 9-1 All were completely collected, and Units 10 and 12 we excavated. A final unit, Grid Unit 13, was laid out to t east of Unit 10. It was two meters long (E/W) by 0 meters wide (N/S). Surface and subsurface artifac from this unit were collected in bulk as a singe specim number.

Surface Description

The site appeared as it had on survey the previous da Several thousand items of debitage and a number formal ground and chipped stone tools were presen concentrated mainly in a shallow, hourglass-shap blowout roughly 20 by 20 meters in overall size. Fort three flakes were collected from the surface of Grids 1- A peak count of ten items (20 items/square meter) w collected from Unit 4. Burned rock was scattered acro the surface of the units. Collections from the surface Units 9-12 netted six flakes. Point-plotted formal too found on the surface included three manos or mano fragments, a fragment of groundstone, a hammerstone, four bifaces, two biface fragments, a projectile point base, four cores, a uniface, two flakes and a possible artifact.

Subsurface Testing

Subsurface testing began with excavation of Grid Units 4 and 7. Grid 4 was excavated in three 10 centimeters levels. In the first level, 31 items of debitage, bone, and burned rock were collected. In Level 2, only one flake was found; it lay near the top of the level. Level 3 was sterile. Rootlets and humus became less common and caliche clasts more common as excavation progressed. No other soil changes were noted in the sandy fill.

Next, auger testing was carried out. A total of six auger tests are indicated on field maps. No record of their contents was found; insofar as this site is very much like AT 35C, they may have been placed to determine potential deposition on the dune crest. If so, then one or more may have been productive. As at AT 35C, grid units were later placed near one of the auger tests. Alternatively, if they proved unproductive, excavation of the later dune-crest test pits was probably done in the interest of methodological consistency and comparability with AT 35C.

Four 0.5 by 1.0 meters units were then placed on the eastern dune crest; these were numbered as Grid Units 9-12. Units 10 and 12 were excavated. Unit 10 was dug in a 13-17 centimeters level, followed by two 10 centimeters levels. Level 1 produced over 51 flakes, a pollen sample, and a flotation soil sample, which were collected from a deeply stained cultural horizon encountered a few centimeters below the surface. Level 2 produced at least ten flakes and also bone. Staining in this level was discontinuous. Level 3 produced about ten flakes and bone; staining was not present at this depth. Cultural materials seem to have become less frequent. The unit was abandoned after the third level.

Unit 12 was dug in four ten centimeter levels. In the first level, staining was not noted. Burned rock and 37 flakes were encountered. In the second level, 24 flakes, a bone, and a possible groundstone item were found. No soil changes were noted; roots became less abundant with depth. In Level 3, only eight flakes and one bone were found. Soil compaction was found to increase; pebbles became more abundant. In Level 4, no artifacts were found; soil compaction increased further. Pebbles were present.

The contrast between the strata seen in Grid Units 10 and 12 prompted the excavation of Grid Unit 13. This unit was opened contiguous with and extending two meters east of Unit 10 (Fig. 2-14). It was 0.5 meter in width. The unit was excavated to a depth of only about ten centimeters in all. The cultural horizon was encountered as a stained level containing burned rock and a hammerstone. At least 29 debitage items and three bones were collected from the surface and fill of Unit 13.

The definition of the cultural layer in Units 10 and 13 was taken as sufficient evidence of research potential. Testing was therefore ended on this site.

Samples Analyzed

Samples analyzed from this site include flotation (Toll, this volume) and pollen (Scott, this volume) from the Unit 10 living surface. Bone from a variety of provenience was also analyzed (Bertram, this volume).

Flotation results were disappointing. Only a single unburned ricegrass fragment was found; it may be intrusive. The pollen spectrum recovered was found to resemble that of site AT 12B, which lies nearby. Corn pollen was present. Scott does not remark further on the AT 36C sample.

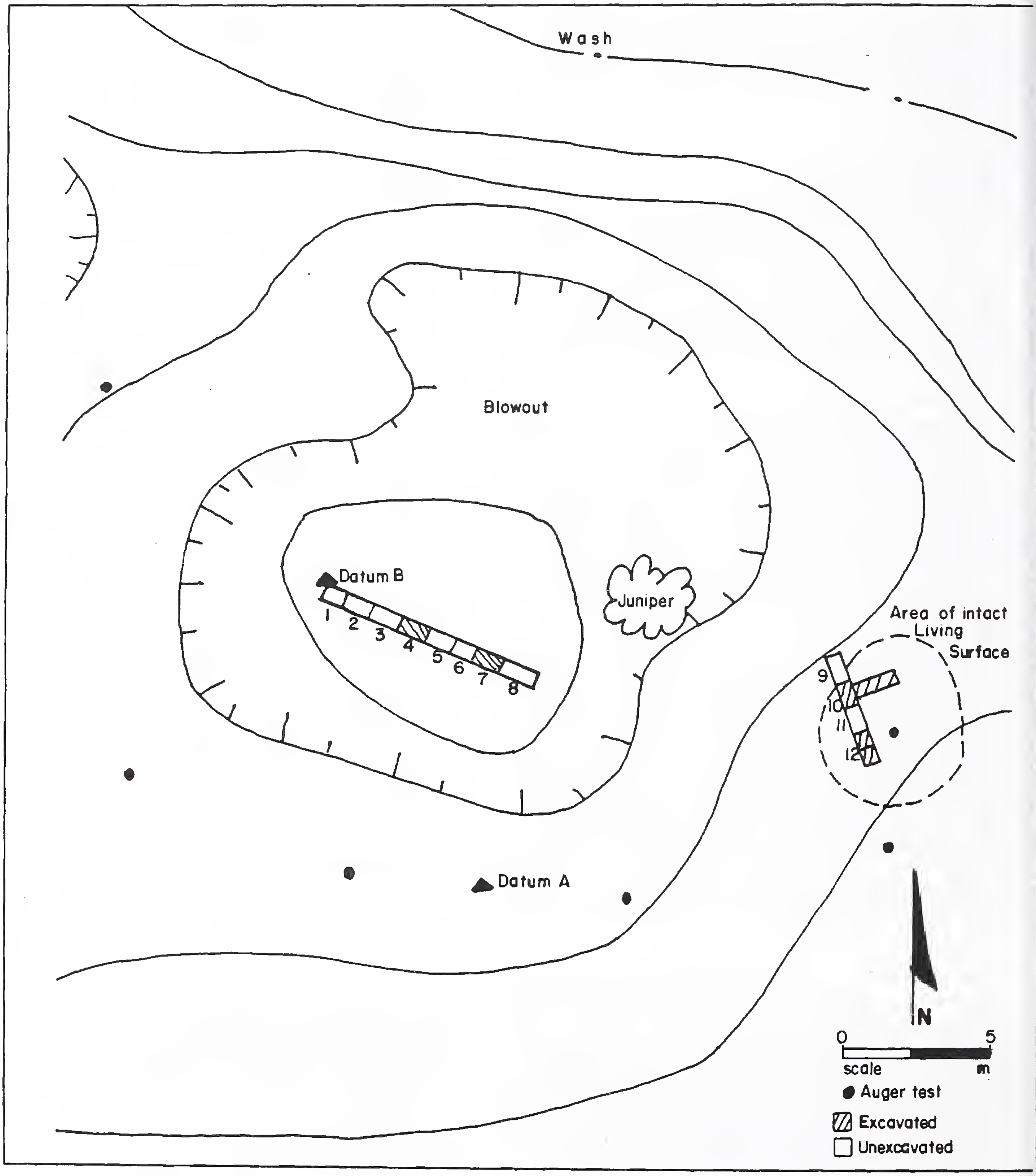
Bone items analyzed included: a badly weathered fragment from Unit 4 surface; 33 burned jackrabbit and jackrabbit-cottontail bones from Unit 10, Level 1; a burned cottontail-sized fragment from Unit 10, Level 2; three small mammal fragments from Unit 10, Level 3; two burned small mammal fragments from Unit 12, Level 2; and five burned rabbit-sized fragments from Unit 13 fill. Forelimb, hind foot, and body elements were present; the jackrabbit may have been exceptionally large. Bertram (this volume) speculated that a large race either of blacktailed jackrabbit or of another hare, since locally extinct, was present during the Anasazi period. At this writing, the evidence pertaining to this issue remains provocative but inconclusive.

Comments

Site AT 36C, an otherwise apparently deflated dune scatter site, seems to have contained a use surface with rich artifactual associations. Corn use and, perhaps, corn and other seed processing are documented for the assemblage associated with the use surface, as is small-game use.

Site AT 37C

Site AT 37C is a probable Basketmaker III habitation site, having chipped and ground stone scatters, several



Map 2-27. Site AT 36C.

exterior storage and/or cooking features, and a possible pithouse. It was assigned the Laboratory of Anthropology site number LA 43996. The site was originally described as a component of the extensive site AT 1A; it lies 300 meters east of that site. It is set at the foot of the Llano de Albuquerque Ceja bajada, where the bajada slope merges with the Rio Puerco floodplain bench, at 5280 feet (1609 meters) elevation. The soil is sandy; the site is sparsely vegetated with rabbitbrush, snakeweed, and bunch or clump grasses.

Survey and Testing

The site was originally described as site AT 1A, Locus 4 (Locus D). Based on that description, it was resurveyed. The decision to assign it a separate site number was made in light of its apparent integrity and its distinctiveness from other loci of AT 1A.

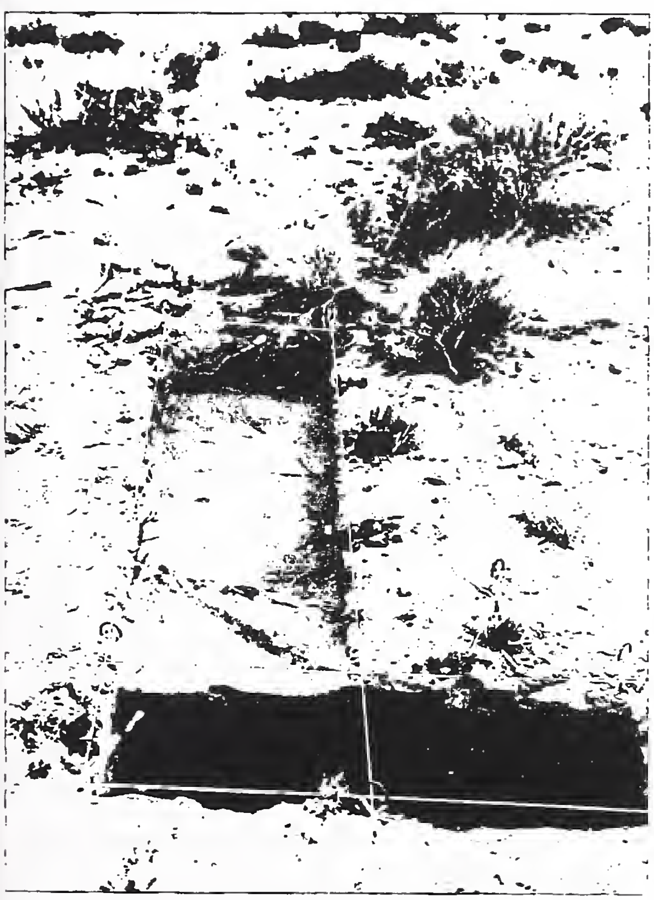


Figure 2-14. Units 10 and 13 viewed from southwest at Site AT 36C.

As redescribed, the site consisted of an oval scatter (50 meters N/S by 40 meters E/W) of chipped and ground lithic items, associated with a few plain grayware sherds, and with internal concentrations of burned rock, chipped stone, cobbles, and slabs. A pithouse depression and other intact features were suspected. Testing was recommended.

The site was tested on January 25 and 26, 1982. Testing began with site examination. All artifacts were pinflagged. Five features were defined. These lay near the eastern (Features 1-3) and western (Features 4 and 5) perimeters of the artifact scatter. The scatter appeared to be elliptical in shape, oriented NE/SW, and approximately 150 meters by 75 meters wide. Artifacts appeared to be densest in the center of the site. The site was mapped from two datum points, established near the foci of the elliptical scatter, and placed 100 feet (30.48 meters) apart. The southwestern datum point was labeled as Datum A, the other point as Datum B. A collection transect of 33 contiguous squares, each three feet (.91 meters) on a side, was defined running between the two datum points. All items found within the grid squares were collected. Feature centers and individual formal tools or diagnostic items were mapped by distance and bearing (Map 2-28). Diagnostics were collected.

A series of shovel and auger tests was dug along the transect, starting at Datum A and spaced at five feet (1.52 meters) intervals (Table 2-13). Most tests were productive. An additional feature, labeled as Feature 6, was defined on the basis of auger testing and surface collection data.

Features 1-5 were auger tested and surface-troweled to permit definition. Each feature was mapped in detail.

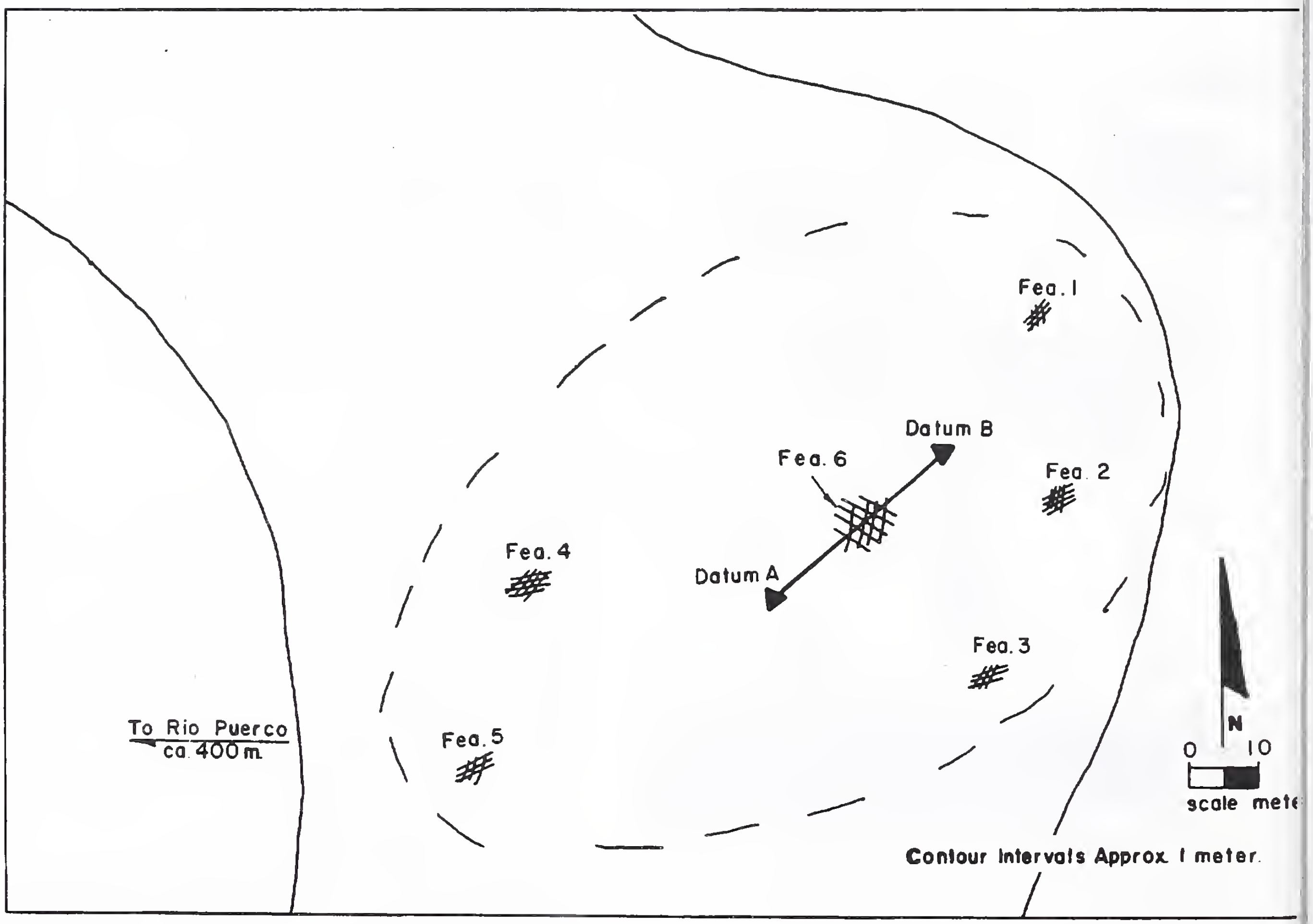
Surface Description

Surface examination of the site revealed a moderate scatter of artifacts, with densities reaching their highest value approximately 25 to 30 meters northeast of Datum A. Within the collection transect were found at least 45 debitage pieces, a utilized flake, four pieces of groundstone, a core, a hammerstone, and about 20 broken cobbles or burned rocks. From the general site area were collected 15 sherds, three manos, a core, a flake, a point tip (En Medio type?), two utilized flakes, two bifaces, a hammerstone, and a piece of groundstone. Groundstone items were collected from Features 2 and 3. Feature 3 also contained a hammerstone. A slab metate was collected from Feature 5.

Feature 1 was a 0.25 square meters scatter of tabular mudstone fragments, found at 44 degrees and 53.3 meters from Datum A. Feature 2 was a 4.0 square meters scatter of groundstone fragments with at least one hammerstone. It lay at 74 degrees and 41 meters from Datum A. Feature 3 was a scatter of tabular mudstone fragments, groundstone, and a hammerstone. It lay at 110 degrees and 29 meters from Datum A. Feature 4 was a semicircular scatter of tabular mudstone fragments, covering about 0.25 square meters area and lying at 272 degrees and 23 meters from Datum A. Feature 5 was a scatter of groundstone fragments, chipped stone tools (the point tip, two bifaces, two utilized flakes), hammerstones, and tabular mudstone fragments covering about three square meters. It lay at 240 degrees and 49 meters from Datum A. Feature 6 was a dispersed scatter of artifacts, centered about 45 degrees and 22 meters from Datum A.

Subsurface Testing

Subsurface testing was limited to shovel and au testing and limited trowel scraping for feature definiti A total of 21 shovel and auger tests were dug at five f (1.52 meters) intervals along the collection transe These were numbered according to their distance fr Datum A. All were excavated to a depth of 50 centin ters below surface. Results (Table 2-13) indicated t the entire transect contained subsurface cultural ma rials. Only the shovel tests at 30 feet (9.14 meters) a at 35 feet (10.67 meters) proved not to contain artifac all other tests produced flakes and/or broken cobbl most of which were probably burned. A mano was fou at ten feet (3.05 meters), sherds at 20 and at 25 feet (and 7.62 meters), groundstone at 50 feet (15.25 mete and bone at 80 feet (24.38 meters) along the transe The richest recoveries were at 75-90 feet (22.86-27. meters) along the transect; notes indicate that



Map 2-28. Site AT 37C.

concentration extended to about 30 centimeters depth in this area, which was defined as a result as Feature 6. Elsewhere along the transect, materials lay only a few centimeters below the surface. More extensive testing was recommended for Feature 6. A slight depression in the ground surface was noted in the general feature area.

Feature 1 was tested by laying out a three feet by four feet grid centered on the feature. This area was troweled to five centimeters depth. One auger test was placed in the center of the feature. The feature proved to be a cluster of tabular mudstone clasts associated with neither ash, burned earth, nor charcoal (Fig. 2-15). The feature was interpreted as a disarticulated cist or cairn.

Feature 2 was tested by laying out a six feet by six feet grid centered on the feature. This area was troweled to five centimeters depth. Two auger tests were placed in the feature to 30 centimeters depth. The feature proved to be a scatter of groundstone fragments with a secondarily ground hammerstone and several Lino Gray sherds (Fig. 2-15). Auger tests were negative. The feature was interpreted as a probable food-processing area.

Feature 3 was tested by laying out a four by four feet (1.22 by 1.22 meters) grid within the scatter. The area was troweled to five centimeters depth. Two auger tests were placed in the feature area to 30 centimeters depth. A few charcoal flecks were found at ten centimeters depth. The feature proved to be a scatter of possible groundstone fragments; it was interpreted as a work area or badly eroded structure (Fig. 2-16).

Feature 4 was tested by laying out a four by four feet (1.22 by 1.22 meters) grid encompassing the feature. This area was troweled to ten centimeters depth. An auger test was placed within the feature to 30 centimeters depth. Charcoal was found to a depth of about 15 centimeters below surface. The feature was interpreted as a stone-lined hearth (Fig. 2-16). Insufficient charcoal was recovered to allow dating.

Feature 5 was tested by laying out a three by five feet (0.91 by 1.52 meters) grid over the center of the dispersed concentration, which contained overall several items of groundstone, hammerstones, bifaces, utilized flakes, and tabular mudstone. The grid was mapped (Fig. 2-17) and shovel-scraped to a depth of

Table 2-13. Site AT 37C (AT 1A, Locus 4), Shovel/Auger Test Results (tests with detailed descriptions only).

Unit Designation (Provenience)	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
Auger test 1	0	45	50	D	-
Auger test 2	1.52	45	50	D	-
Auger test 3	3.05	45	50	G	-
Auger test 4	4.57	45	50	D	-
Auger test 5	6.1	45	50	S	-
Auger test 6	7.62	45	50	S	-
Auger test 9	12.19	45	50	R	-
Auger test 10	13.72	45	50	D	-
Auger test 11	15.24	45	50	G	-
Auger test 12	16.76	45	50	D	-
Auger test 13	18.29	45	50	D	-
Auger test 14	19.81	45	50	D,R	-
Auger test 16	21.34	45	50	D	-
Auger test 17	22.86	45	50	D	-
Auger test 18	24.38	45	50	B,D,R	-
Auger test 19	25.91	45	50	D	-
Auger test 20	27.43	45	50	D	-
Auger test 21	28.96	45	50	D	-
Auger test 22	30.48	45	50	D	-

Key: B - Bone, D - Debitage, G - Groundstone, R - Fire Cracked Rock, S - Sherds.

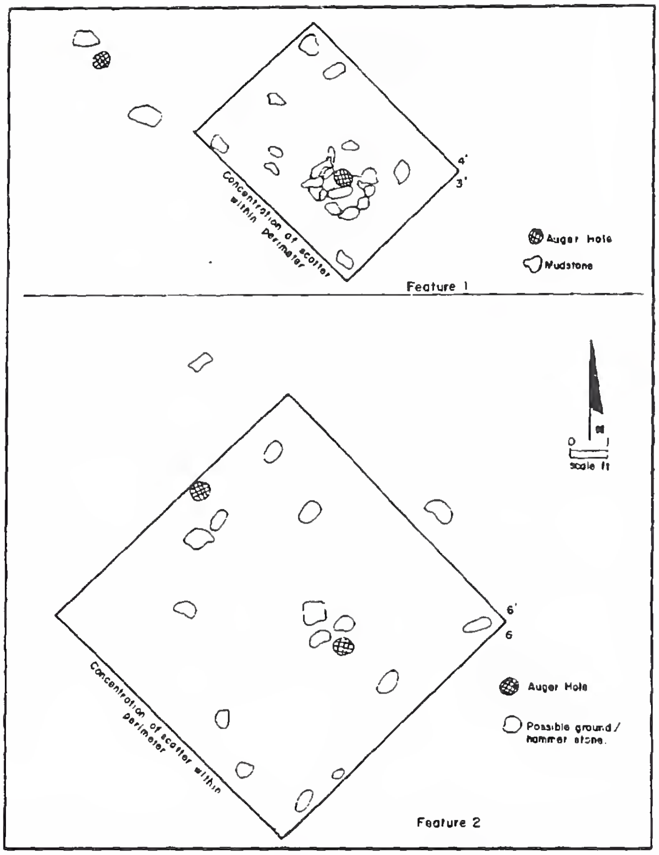


Figure 2-15. Features 1 (top) and 2, at Site AT 37C.

ten centimeters. Two auger tests were dug to 30 centimeters within the feature. A few flakes were encountered at depths less than ten centimeters, but no ash or charcoal stains were noted. The feature was interpreted as a work area, possibly associated with a disarticulated hearth or structure.

Samples Analyzed

Samples of ceramics and bone were analyzed from AT 37C. Ceramics (Warren and Warren, this volume) included a total of 18 sherds; Lino Gray (two bowl and 13 jar sherds), undescribed plainware (two unspecified sherds), and undifferentiated redware (one bowl sherd). All the ceramics found are reasonably dated to the late Basketmaker III period. Three Lino sherds were further studied. All contained similar temper, including fractures of hematitic sandstone, thought to indicate manufacture in the Rio Salado area, although local manufacture was not ruled out.

A possibly roasted cottontail premolar tooth was only bone studied from this site (Bertram, this volu It was found in the auger test at 80 feet (24.38 me from Datum A.

Comments

Site AT 37C appears to be a Basketmaker III habit and processing site with an unusual abundan ground stone, based on field identifications. Se features appear to be present, including possibl flated surface structures, a hearth, and localized concentrations. Testing did not penetrate deeply en to rule out pit structures, the possible presence of w was suggested by the testing crew.

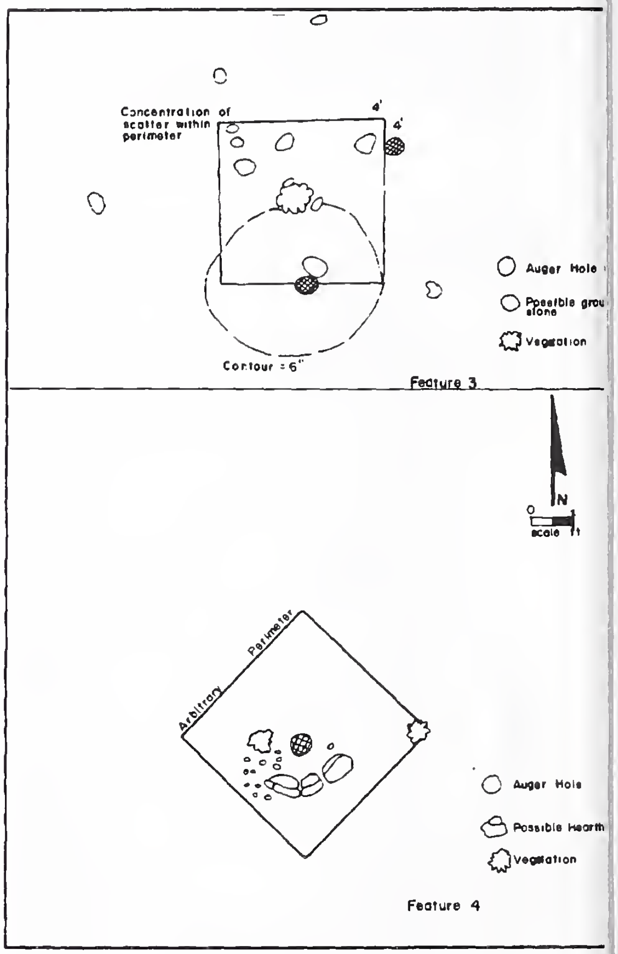


Figure 2-16. Site AT 37C, Features 3 (top) and 4.

Site AT 38C

Site AT 38C is a Pueblo II sherd and lithic scatter with an associated intact hearth, and a hearth dump or informal hearth complex. It was assigned the Laboratory of Anthropology site number LA 43997. The site is located in Township 9N, Range 1W, Section 14, at 5370 feet (1637 meters) elevation. The site is set on the lower bajada slopes of the Llano de Albuquerque Ceja. Sites AT 9C through AT 13C are all located within a few hundred meters. The site is situated on a semi-stabilized coppice dune capping a low bajada ridge; artifacts are mainly exposed in a blowout. Local vegetation is sparse, composed mostly of clump grasses, snakeweed, and narrow-leaf yucca. The site is apparently not badly eroded.

Survey and Testing

The site was described, on a supplementary survey (February 1, 1982) after the testing phase had begun, as a Pueblo II sherd and lithic scatter, with associated groundstone, hearths, and possible structural debris. The site was estimated to extend over 300 square meters in a single concentration. The site overall was estimated to cover 2000 square meters area. Data potential was judged to be good, inasmuch as deflation appeared not to have disrupted the site in the hearth feature area. A hearth (later named Feature 1) was found to be filled with sherds; the hearth was photographed and the sherds collected (see "Surface Description" below).

The site was tested on February 3 and 4, 1982. Testing began with site definition, which was done by pinflagging all artifacts. A datum point was set within the north portion of the blowout; the site was mapped relative to this datum point. A baseline was then extended 15 meters south-southwest from datum (at 212 degrees east of true north). Fifteen one by one meter collection units were defined along this baseline. All items within the grid units were collected.

Auger tests were then placed around the site area. The locations of two productive tests and four unproductive tests are known from notes. A total of 18 auger tests are indicated on one field map; of these, eight were apparently productive.

Two test pits were dug along the grid transect, at two to three meters southwest of datum and at 11-12 meters southwest of datum. The definite hearth (Feature 1) was surface-collected and then excavated. The associated hearth dump complex, composed of three discrete stains, was scraped and the upper fill collected.

Surface Description

The site was found to consist of a scatter of artifacts dominated by Pueblo II decorated and corrugated sherds. Many of these were concentrated within the Feature 1 hearth, which lay on the floor of the south-facing dune crest blowout within which most artifacts were found (Map 2-29). The field specimen catalog does not provide item counts for this site, but it indicates that the artifacts collected from the grid transect included sherds, flakes, groundstone, bone, and a core. Notes indicate that no formal chipped stone tools were found.

Feature 1 (Fig. 2-18) was found on survey to contain hundreds of sherds, which were collected before testing began. Feature 2 was found to consist of three small, informal hearths or midden/hearth-fill deposits; it lay only one to two meters southwest of Feature 1. Neither feature appeared to be severely deflated.

Subsurface Testing

Testing began with excavation of the collection grid units located at two to three meters from datum and at 11-12 meters from datum. These were identified as Units 3 and 12. Both were excavated in ten centimeters levels; the auger was then used to probe to 60 centimeters below surface.

In Unit 3, sherds and flakes were found in Levels 1 and 2. The third level and the auger test were sterile. In Unit 12, sherds, flakes, bone, and shell ornament fragments were found in the uppermost level. In Level 2, no cultural materials were found. The auger test was also sterile.

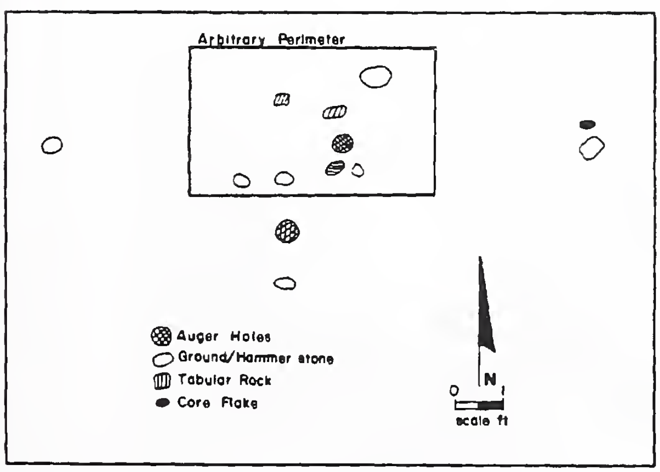
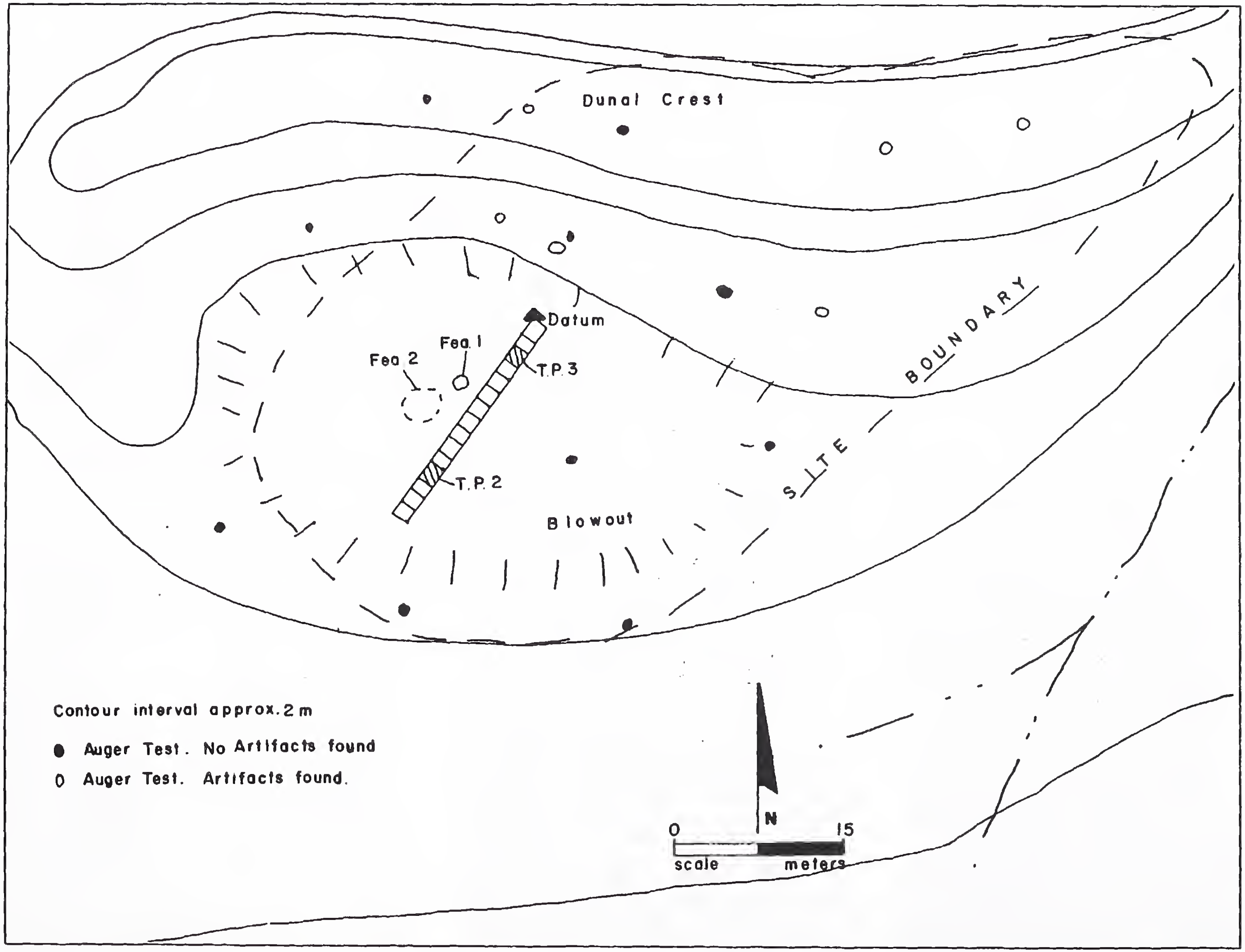


Figure 2-17. Site AT 37C, Feature 5.



Map 2-29. Site AT 38C, a Pueblo II sherd and lithic scatter.

At least 6 and as many as 18 auger tests were dug randomly across the site. These were dug to recorded depths ranging from 60 to 130 centimeters at completion. At least two and as many as eight of these tests encountered cultural materials. Auger Test 1, located just northeast of datum on the blowout crest, encountered charcoal at an unspecified depth and flakes at 120 centimeters below surface. Auger Test 2, located about six meters west of Auger Test 1, produced charcoal staining for most of its depth of 1 meter; a flake and a sherd were found at about 25 centimeters depth. Notes indicate that the cultural materials from these two (and other productive) auger tests seemed to lie at about the level of the blowout floor. Evidence reported in the notes suggests that the cultural deposits continued as deeply buried deposits, under the dune to the north of the blowout, for as much as 60 meters northeast of the blowout margin.

Feature 1 was tested by imposing a one by one meter grid. Excavation proceeded by ten centimeters levels, of which three were dug. Collections from the surface and the first level were apparently pooled; they included 233 sherds, a ground stone fragment, two spent cores, and about 20 pieces of primary, secondary, and tertiary debitage. Level 2 produced about 15 sherds and flakes. Level 3 was probably sterile; a rodent burrow contained one sherd.

Feature 2 was tested by troweling to clear loose surface sand. The feature, which lay adjacent to and just southwest of Feature 1, proved to consist of three small circular ash stains, with a few associated sherds. Each of the three stains was sampled for flotation. The southernmost stain, Feature 3-C, was dug in profile to ten centimeters depth. The stain continued deeper, but excavation was not continued. A pollen sample was collected.

Samples Analyzed

Samples analyzed from AT 38C included six bones, two shell fragments, a flotation sample, and 360 sherds. Pollen samples were apparently not submitted for study.

Sherds from the site included, in descending order of abundance, Chaco Corrugated (150 jar sherds), undifferentiated plainware (five bowl and 48 jar sherds), undifferentiated whiteware (nine bowl and 45 jar sherds), early Gallup B/w (five bowl and 26 jar sherds), undifferentiated mineral/w (14 bowl and five jar sherds), Red Mesa B/w (11 jar sherds), and Kana'a Neckbanded (nine jar sherds). Additional types represented by fewer than eight sherds each were: Kiatuthlanna B/w, Escavada B/w, Cortez B/w, Puerco B/w, Carbon (Mesa

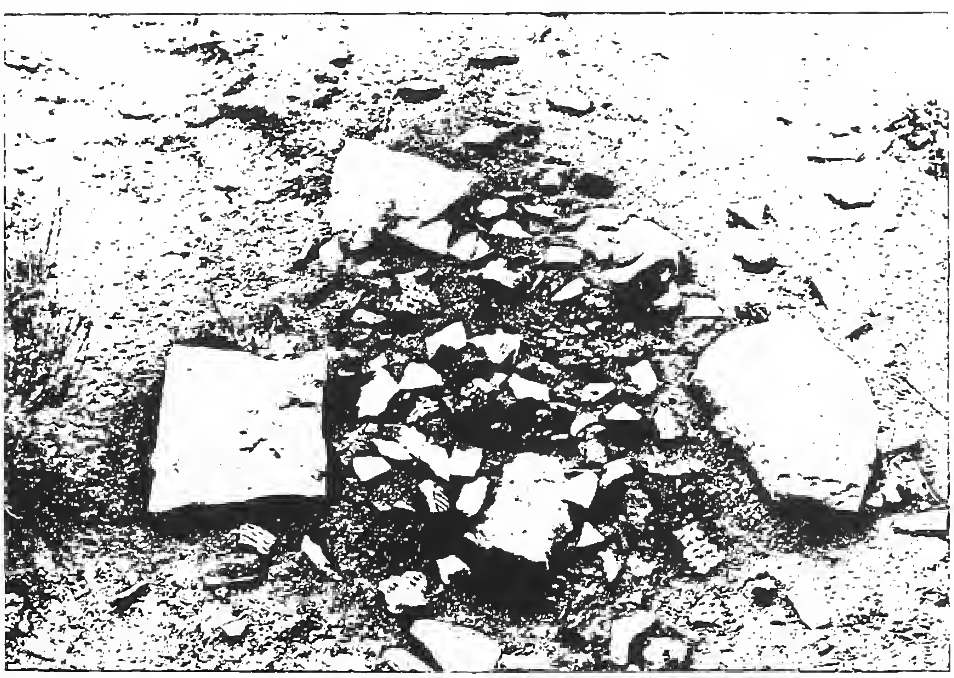


Figure 2-18. Pueblo II sherds at Site AT 38C, Feature 1.

Verde ?) B/w, Pitoche Banded, Corrugated Indented, and Washboard Banded. These types indicate that the bulk of occupation was in Pueblo II times, with lesser occupational intensity as early as late Pueblo I and perhaps as late as early Pueblo III times. Temper analysis of 57 sherds indicated manufacture in the general Rio Salado-Acoma area for most vessels. It was estimated that at least 21 vessels in all were represented, with over half of them represented in the sherd dump within Feature 1.

The flotation sample from Feature 2C was submitted for analysis (Toll, this volume). It proved to contain only modern contaminants and finely divided ash.

Bone samples (Bertram, this volume) included cancellous fragments from a large mammal, burned hard white; these were collected from the surface of Collection Grid 13. From the upper excavated level of Test Grid 12 were recovered two artiodactyl metapodial fragments and a jackrabbit-sized long bone fragment. All three pieces were burned hard white. Also from this provenience were two fragments of shell ornament, almost certainly from abalone shell. These pieces probably came from the coast of California Alta.

Comments

Testing seems to have demonstrated that site AT 38C is an essentially uneroded, buried site having a major component dating to the Pueblo II period. Slightly earlier and later components may also be represented. The high ratio of utility to decorated wares and the relatively high decorated jar to decorated bowl ratio both suggest that a special purpose processing site, field house, or small habitation site is represented. The absence of formal chipped stone tools may be an artifact of post-abandonment human behavior; the presence of obviously collected and dumped sherds within Feature 1 may indicate that the site had been vandalized prehistorically or in the recent past. If so, then formal tools may have been collected and removed.

Conclusions: Atrisco Sites

This section has summarized observations made in the course of survey and testing of 28 prehistoric sites and a single historic site, carried out as part of the Elena Gallegos Land Exchange Project. The data base for preparation of this summary included survey and testing phase observations and results. It also included the final results of laboratory and specialist analyses of ceramics, faunal materials, macrobotanical remains, pollen collections, obsidian hydration determinations and radiocarbon dating. Summary data for chipped and ground stone assemblages presented here, by contr reflect field impressions and preliminary accessior observations only; except insofar as lithic analysis sults may modify or enhance preliminary interpretati the site summaries may be regarded as complete. characteristics of the Atrisco tested sites are sum rized in Tables 2-14 through 2-17.

Chronology

The sites tested in the 1981-82 program produced d suggesting that a range of occupational complexit represented. This range extends from rather sin lithic scatters through multiple-activity sites and mu component special-use sites, to apparently com occupational sites. The occupations recorded seen be classifiable, in the main, as short-term camps, qua locations, and agricultural-residential central locatic Temporal components range from Basketmaker through Pueblo IV, with at least one Territorial Pe historic camp also being identified.

Dates inferred from projectile points are tentative, sir in most cases, only field descriptions of points and p fragments were available for study. In a more gen sense, projectile point dating is not reliable in the Atri case. The only non-Anasazi diagnostics are referre as "Basketmaker" or "En Medio" points; i.e., corr notched points of medium or large size. A body research is developing which indicates that such poi continued to be collected from old sites and also to newly manufactured well into the Rio Grande Coalit and perhaps into the Rio Grande Classic periods (Bertr 1987). The rather more diagnostic arrow points from Atrisco sites are rare and, usually, too inadequat described to permit their assignment to earlier (corn notched) or later (side-notched) classes. No definit pre-Basketmaker points were reported from the Atri sector.

The lack of a well-defined ceramic chronology for Atrisco area is also a limiting factor in assignment ages to sites or loci. The great bulk of ceramics from project were classified as variants of Kiatuthlanna B, Socorro B/w, Lino Gray, Tohatchi Neckbanded, or one or another variety of (Indented) Corrugated Uti wares. The definition of Kiatuthlanna B/w employe this study, in fact, makes distinction of termi Basketmaker III/early Pueblo I Kiatuthlanna from ea Pueblo II Kiatuthlanna difficult and problematic. T same problem arises with Socorro B/w; the type defined for this project may occur in latest Pueblo I a may continue in use until earliest Pueblo IV.

Indented corrugated wares are generally characteris of middle Pueblo II through early Pueblo IV assembla

Table 2-14. Atrisco Site Summary Characteristics.

Site Number	Structures	Elevation	Setting	Burned Rock Scatters	Hearths	Inferred Age
AT 1A	y	1602	Floodplain	P	1	Archaic-PI
AT 3B	?	1614	Slight rise	-	1	PII-PIV
AT 5B	n	1623	Bajada spur	-	-	-
AT 6B	n	1617	Low rise	-	-	PI-PV
AT 8B	n	1705	Dune ridge	2(?)	-	BMIII-PI and PIII/PIV
AT 9B	n	1724	Dune ridge	-	-	-
AT 10B	n	1760	Ceja crest	-	2	-
AT 11B	n	1705	Dune ridge	-	-	PIII
AT 12B	y	1705	Dune base & slope	-	1(?)	PIV
AT 6C	n	1650	Dune ridge	1	-	PIII
AT 8C	n	1657	Dune ridge	-	-	-
AT 11C	?	1632	Slope	-	-	Territorial
AT 15C	y	1620	Floodplain	-	3	PI, PII, (BMIII?)
AT 17C	?	1623	Dune ridge	-	-	PIII?
AT 18C	?	1675	Dune ridge	1	-	PIII?
AT 19C	?	1666	Dune slope	-	-	PIII-PIV
AT 20C	?	1699	Dune ridge	-	-	Archaic - PI
AT 21C	?	1678	Dune ridge	-		PI-PIII
AT 22C	?	1705	Dune ridge	1	-	?
AT 24C	?	1614	Floodplain	1	-	Locus 1: BMIII Locus 2: PIII -PIV
AT 25C	?	1614	Floodplain	-	-	BMIII
AT 27C	n	1617	Floodplain	-	-	Archaic?
AT 28C	?	1613	Floodplain	-	2(?)	BMIII
AT 29C	?	1614	Floodplain	1	-	PI, PII, PIII
AT 31C	p	1618	Terrace ridge?	-	-	early BMIII
AT 35C	n	1721	Ridge	-	-	?
AT 36C	n	1699	Slope	-	-	?
AT 37C	y	1609	Floodplain	-	1	BMIII

Key: y - yes, n - no, p - probably, ? - uncertain, no data or insufficient testing.

elsewhere, but local dating is limited. Certainly the types "Chaco Corrugated," "Mancos Corrugated," and "Ochoa Indented" can be applied to Puerco sherds only with considerable reservation. The Mancos type is best defined from north of the San Juan River; the Ochoa type is best known from the area between Roswell, New Mexico, and Midland, Texas. The range of common manufacture dates for the various Lino types is not known, but it certainly extends (for rim sherds) from at least A.D. 425 until not much later than A.D. 900.

Tohatchi Banded Utility is even more problematic; it occurs as "narrow banded" (neck bands generally less than eight millimeters wide) and as "wide banded" (neck bands 9-16 millimeters wide) in the Atrisco data. The narrow banded form may occur as early as Pueblo I and as late as Pueblo III; the wide banded form is rare in sites later than very early Pueblo II. Wide banded Tohatchi was viewed in this report as a variant of Kana'a Neckbanded Utility, the central diagnostic for Pueblo I sites, where band width data were obtainable.

Table 2-15. Atrisco Site Summary — Tools.

Site Number	Mano (#)	Metate (#)	Ground Stone	Ax/ Maul	Chopper	Other Tools
AT 1A	17	-	10	-	-	?
AT 3B	-	-	6	-	-	1
AT 5B	-	-	1	1	-	1
AT 6B	-	-	-	-	-	-
AT 8B	-	-	1	-	-	-
AT 9B	-	-	-	-	-	-
AT 10B	-	-	-	-	-	1
AT 11B	-	-	-	-	-	-
AT 12B	-	-	8	-	-	-
AT 6C	-	-	2	-	-	1
AT 8C	-	-	1	-	-	1
AT 11C	-	-	2	-	-	-
AT 15C	-	-	1	-	-	-
AT 17C	-	-	-	-	-	1
AT 18C	-	-	1	-	-	-
AT 19C	-	-	-	-	-	-
AT 20C	-	-	-	-	-	-
AT 21C	3	-	-	-	-	2
AT 22C	-	-	1	-	-	-
AT 24C	-	-	-	-	-	-
AT 25C	-	-	-	-	-	-
AT 27C	-	-	-	-	-	-
AT 28C	-	-	-	-	1	1
AT 29C	2	-	1		-	-
AT 31C	6	2	3	-	2	8
AT 35C	-	-	2	-	-	1
AT 36C	3	-	2	-	-	1
AT 37C	4	-	9	-	-	27
AT 38C	-	-	1	-	-	-

Radiocarbon dates seem in general to be a bit early for full consistency with the associated ceramics. This may be due to the old-wood problem (preferential use of dead juniper snags), the use of mixed juniper, sage, and saltbush wood (the C3-C4 problem), calibration errors, or a combination of these effects. If these effects are allowed for, no definitely unreasonable radiocarbon dates were obtained.

Obsidian hydration data are problematic in this study for two reasons: sourcing was not done objectively, and most of the dates on opaque obsidian were unacceptably recent. The study points up, yet again, the need to carry out elemental source determinations for all chronometric obsidian samples. Also suggested are the possibility that a second, important, vitrophyric obsidian source still awaits discovery, and the possibility that hydrati rind measurements on vitrophyres are fundamenta unreliable.

With these reservations in mind, the sites were dated association with ceramics, radiocarbon and points. T results indicate that these sites represent periods occupation including Basketmaker III (AT 24C1, 25C, AT 28C, AT 31C, AT 37C); Basketmaker III-PI (8B); PI (AT 15C lower component, AT 29C?); Pueblo Pueblo II (AT 15C?); Pueblo II (AT 15C upper compone AT 29C, AT 38C); Pueblo III (AT 11B, AT 6C, AT 17C, 18C); Pueblo III-Pueblo IV (AT 8B, AT 19C, AT 24C2?, 29C?); Pueblo IV (AT 12B); and Historic (AT 11C). Sit with apparent wider time ranges, due to unresolv multicomponency, include Archaic-Pueblo (AT 1A,

Table 2-17. Atrisco Site Summary — Vessels by Group, Wares, Age (intrusives deleted)

	BMIII-PI				PII-PIII				PIII-PIV				Historic			
	Jars		Bowls		Jars		Bowls		Jars		Bowls		Jars		Bowls	
Site	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec
AT 1A	4			3		1		1								
AT 3B	1				8	10	1	10	3							
AT 6B					2	4		1	2			1				
AT 8B	1							1	2		1					
AT 11B	?				?			1	?							
AT 12B											2					
AT 6C	2?				3+	5		2	2?							
AT 11C						1							4	1	2	
AT 15C	7				6	9		10								
AT 17C	?				?	1			?							
AT 18C						3					2					
AT 19C									2	1						
AT 21C	2?				2?	1										
AT 22C				1												
AT 24C	2	2														
AT 25C	2+	2		2												
AT 28C	1+1?			1?	?			?								
AT 29C	2+				?	2		2								
AT 31C	many	8	1	2												
AT 37C	1+?		1	1												
AT 38C	1		?	?	~15	10+	?	4+								

succulent fruits, as well as corn. Probable evidence of corn horticulture in the immediate area was obtained from AT 12B, AT 15C, AT 25C, and AT 36C (pollen), and from AT 3C, AT 15C, and AT 31C (macrobotanical and flotation). The early Basketmaker III corn from AT 31C is 12-row corn, while later specimens are 8-row or 10-row corn. It is likely that some or all of the sites in Section 33 (AT 24C through AT 31C) are actual field sites or sites associated with floodplain agriculture. The bajada, sand-dune and slope sites in the southern study parcels may have included akchin-type field sites, sand-dune field sites, and one or more floodplain field sites.

Wild pollens and charcoal recovered from the Atrisco sites seem to indicate an environment not very different from the present one. Fuels are dominated by juniper, saltbush, greasewood, and cottonwood/willow. Annuals include dominantly those present today; past disturbance due to agriculture may be reflected by the abundance of weedy annuals such as pigweed, goosefoot and purslane.

Technology

Most sites in this study exhibited a mixture of primary quarry reduction and late-stage lithic tool production. In general, quarry sites seem to have been located on the upper Ceja bajada, which has local outcrops of Santa Fe gravels. Sites having mostly later-stage reduction or a high frequency of formal tools were more often located on the lower bajada, the floodplain, or on coppice dunes. As expected, groundstone items occurred more often and more abundantly in association with thermal or structural features or the probable remains of such features. Most manos observed or collected were either undescribed or were characterized as one-hand manos. Two-hand manos were rarely reported, an anomaly considering the overwhelming predominance of Anasazi sites in the area.

Ceramic technology seems to have relied heavily on import. Sources identified were most commonly the Red Mesa Valley (near Gallup), the southern San Juan Basin in general, or the Rio Salado (del sur?) valley, southwest

Table 2-16. Atrisco Site Summary — Food and Tools.

Site Number	Debitage Density (Relative)	Core (#)	Core Tool (#)	Projectile Points	Bifacial Artifacts	Plant Foods Processed	Animal Foods Processe
AT 1A	High	1	-	7(?)	33	W?	L,R?
AT 3B		1	-	1	4	-	L,E
AT 5B	12+	3	-	-	-	-	-
AT 6B	13+	-	-	-	1	-	-
AT 8B	14+	-	-	-	-	-	-
AT 9B	2+	-	-	-	-	-	-
AT 10B	12+	1	-	-	1	-	-
AT 11B	7+	Several	-	-	-	-	-
AT 12B	15+	3	-	-	2	W,C?	R,L,A?
AT 6C	34	2	-	-	-	-	-
AT 8C	33	8	-	-	-	-	-
AT 11C	5	2	-	-	1	-	-
AT 15C	High	-	-	-	-	W,C	R,L,A
AT 17C	1	-	-	-	-	-	-
AT 18C	18+	-	-	-	-	-	L?
AT 19C	-	-	-	-	-	-	-
AT 20C	-	-	-	-	-	-	-
AT 21C	44+	5	1	-	-	-	A?
AT 22C	5+	-	-	-	-	-	-
AT 24C	22+	1	-	-	-	-	-
AT 25C	67+	7	-	-	-	W?,C?	-
AT 27C	167++	1	-	-	-	-	-
AT 28C	99++	1	-	-	1	-	-
AT 29C	47+	-	-	-	-	-	-
AT 31C		5	-	-	2	W,C	R,L
AT 35C	56+	-	-	-	28?	-	-
AT 36C	127+	4	-	1	6	W?,C	L
AT 37C	103	2	-	1	2	-	L?
AT 38C	26+	1	-	-	-	-	A,L?

Key: W - wild plants; C - corn; L - lagomorphs; R - rodent; E - egg shell; A - artiodactyl; S - shell (marine); ? - uncertain if processed.

20C); Pueblo I-Pueblo III (AT 21C); and Pueblo I-Pueblo IV (AT 6B). Sites for which no age estimate was made include AT 5B, AT 9B, AT 10B, AT 8C, AT 27C, AT 35C and AT 36C.

The picture that emerges from testing data alone is of an area characterized by relatively heavy occupation in Basketmaker III and perhaps early Pueblo I times, much lighter occupation in late Pueblo I and early Pueblo II times, and again increasing occupation beginning in late Pueblo II and continuing into early Pueblo IV times. Little evidence of Archaic occupation was found; only one clear Pueblo IV and one clearly historic site were tested. Remarkably, the richest and most promising site in the testing project, AT 15C, seems to pertai period at which occupation elsewhere in the a clined, as measured by number of sites. Th indicate a local tendency toward aggregation Pueblo I/early and middle Pueblo II times.

Subsistence

Subsistence behavior in the Atrisco sites seem rather typical of eastern Anasazi sites in general. foods emphasized rabbits, hares, and larger r with occasional artiodactyls being taken. Plar included a wide range of wild greens, seeds, and of Belen. Other sources were the general Manzano Mountains area, east and southeast of Albuquerque, and the Rio Abajo area extending roughly from Belen south along the Rio Grande. Occasional imports from the northern San Juan province and from eastern Arizona were recognized in all periods. Neighboring sites AT 3B and AT 6B seemed to have unusual diversity of long-range ceramic import types, suggesting perhaps that they were part of a major travel and trade route. Even Santa Fe B/w from this area was reported as sometimes coming from the Rio Salado drainage, suggesting that it might better have been typed as Magdalena B/w or one of the *affinis* Magdalena B/w (Mogollon-Anasazi Pueblo III carbon) wares only now being properly studied (Lekson, personal communication, 1986; Knight, personal communication, 1987; Hill, personal communication, 1988).

Genuine exotic items were limited to greater and lesser Olive shells from the Gulf of California (Sonora and/or California Baja) and abalone shell from the Pacific coast (California Alta). These items are known from earlier (Archaic and Basketmaker) contexts in the region and are not unusual.

Summary

It seems clear that occupation of the Atrisco study area was, in all periods, mainly directed toward local horticulture, wild plant and animal resource acquisition, and exploitation of the local Santa Fe gravels for knappable stone. No clear temporal trends can be defined based only on the 29 tested sites' data; it appears, however, that occupation in all periods was linked to more-heavily-occupied areas to the east, southwest, or west. Trade relations, as inferred from ceramics, extended into Arizona and perhaps southeastern Utah; based on exotic shell, interaction extended into the Sonora and California Alta seacoast areas. Settlement may have been heaviest in the late Basketmaker III-early Pueblo I period and again in the late Pueblo II-early Pueblo IV period. This conclusion should be evaluated against the larger Rio Puerco data base now available as a result of the Elena Gallegos and other projects.

The Placitas Sites

Galen R. Burgett

Site PL 24A

Site PL 24A is a small, aceramic, lithic scatter with the remains of a cairn-like cobble feature. The site is located in Township 13N, Range 4E, Section 13, on a gravel-covered knoll overlooking Las Huertas Creek. Sites PL 4A, PL 35A, PL 50A, and PL 51A, are located only a few hundred meters away to the west and southwest. The knoll extends westward from a low mesa and lies at an elevation of 5410 feet (1647 meters). There is no vegetation on the site itself; the adjacent creek bottom and mesa top have juniper and wild grasses.

Survey and Testing

The site was characterized during the survey as an aceramic lithic scatter of chert and obsidian flakes. A quartz crystal was also observed and collected. A feature was described as a small (1 by 0.7 meter) cobble "cairn" which had collapsed and subsequently been filled in with silt. The cairn was judged to have been a shrine of some sort. Site condition was good with no noticeable disturbance. Potential for subsurface cultural deposits was indeterminate.

The site was tested on February 23, 1982. Testing consisted of installing a datum point and laying out a ten by nine meters collection grid (90 one by one meter units). All surface artifacts within each grid unit were collected. Four randomly placed, 15 centimeters deep shovel cuts were excavated within the confines of the collection grid (Table 2-18). An additional shovel cut was placed beneath the cobble concentration.

Surface Description

Surface examination revealed a lithic scatter, covering approximately 150 square meters, and the cobble feature (Map 2-30). Approximately 3067 lithic artifacts were recovered from the surface. The lithics were largely primary, secondary, and tertiary flakes with some angular debris. Observed lithic raw materials included chalcedony, chert, silicified wood, basalt, and obsidian. A few possible hammerstone fragments were also collected. A piece of turquoise was also collected near the cobble concentration. Within the scatter area, two high density concentrations were detected and a lithic density isopleth plan view was created. The centers of the concentrations were five and nine meters to the northeast of the site datum (Fig. 2-19). The southernmost concentration had a high density of 78 items/square meter. The northern concentration was observed to have 87 items/square meter. The northern concentration lay immediately to the north of the cobble feature and artifact density decreased dramatically to the east, south, and west of the feature. Overall artifact density for the site was about 34 items/square meter.

Table 2-18. Site PL 24A, Shovel/Auger Test Results (tests with detailed descriptions only).

	Unit Designation (Provenience)	Datum	Distance (m)	Bearing (degrees)	Depth (cm)	Contents	To Bedrock?
	Test Hole 1	A	6.8	42	0 - 15	D	
No							
	Test Hole 2	A	0.6	159	0 - 15	D	No
	Test Hole 3	A	9.0	49	0 - 15	D	No
	Test Hole 4	A	7.8	59	0 - 15	D	No

Key: D - Debitage

Subsurface Testing

Four shovel cuts were placed within the collection grid in the area of highest artifact density. A fifth was placed near the site datum. The four shovel cuts all produced a few flakes from the upper centimeters (Table 2-15). The shovel cut within the rock feature produced no artifacts. Deeper tests were precluded by the extremely rocky nature of the substrate.

Comments

It was obvious that the main activity conducted at PL 24A was reduction of locally-available lithic resources. The role of the "cairn" or cobble concentration is problematic, although it was suggested that it could have been a shrine. The absence of artifacts beneath the cairn suggests that the lithic reduction took place after its construction. Relationships to the sites noted previously are indeterminate, as is the date of utilization.

Site PL 34A

Site PL 34A is a lithic scatter with a rectilinear arrangement of cobbles which may have been a structure. The site is located in Township 13N Range 4E, Section 14, on the western edge of Las Huertas Canyon, and immediately south of PL 35A. The site is situated on the edge of a low mesa at an elevation of 5320 feet (1620 meters). Two gullies border the site on its north and south sides. Sediments are colluvial and alluvial deposits, largely sand. On-site vegetation consisted of scattered juniper, bunch grasses, and sparse sage.

Survey and Testing

The site was characterized as a lithic scatter w
possible rectangular structure. Artifacts observed
collected consisted of basalt, chert, and obsidian fl
one basalt knife and a possible Archaic projectile
mid-section. Site condition was observed to be
with no disturbance.

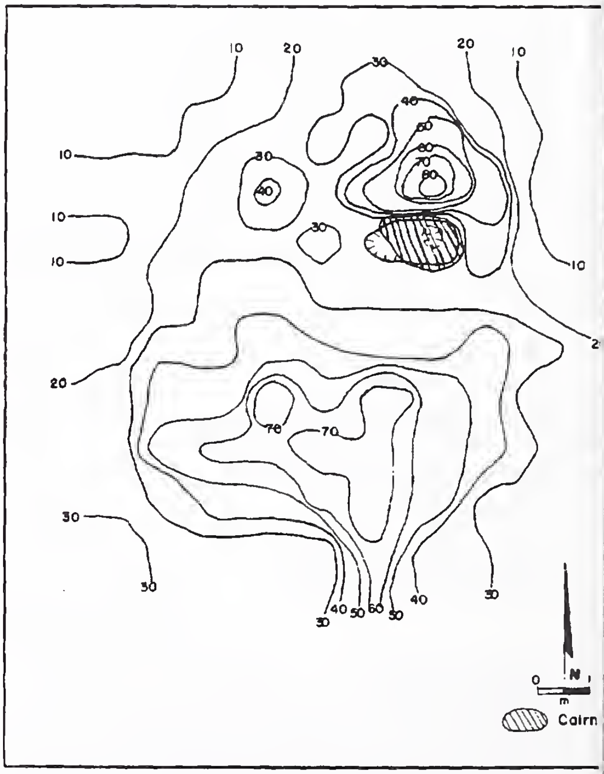
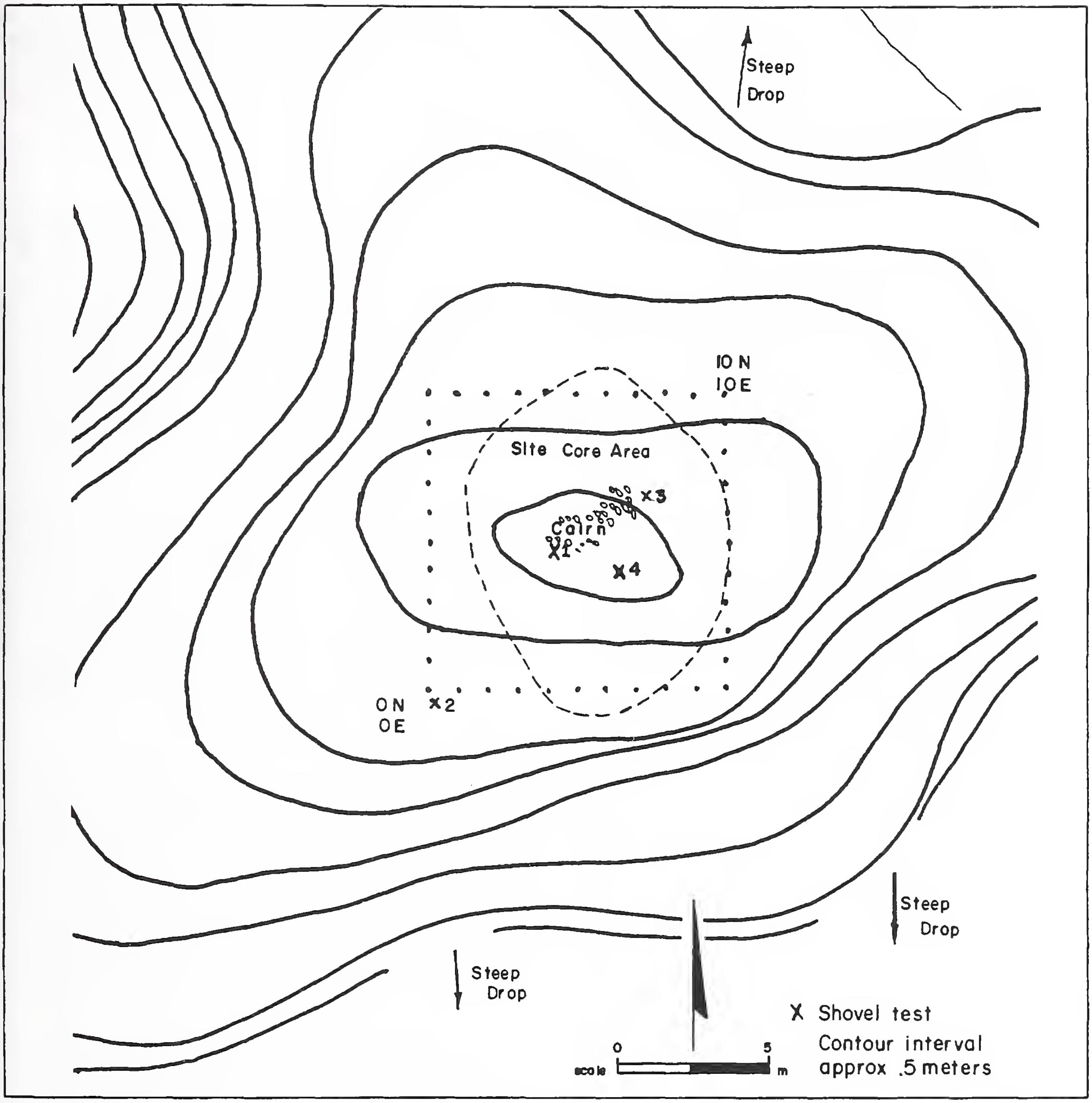


Figure 2-19. Lithic density contours of Site PL 24A.



Map 2-30. Site PL 24A.

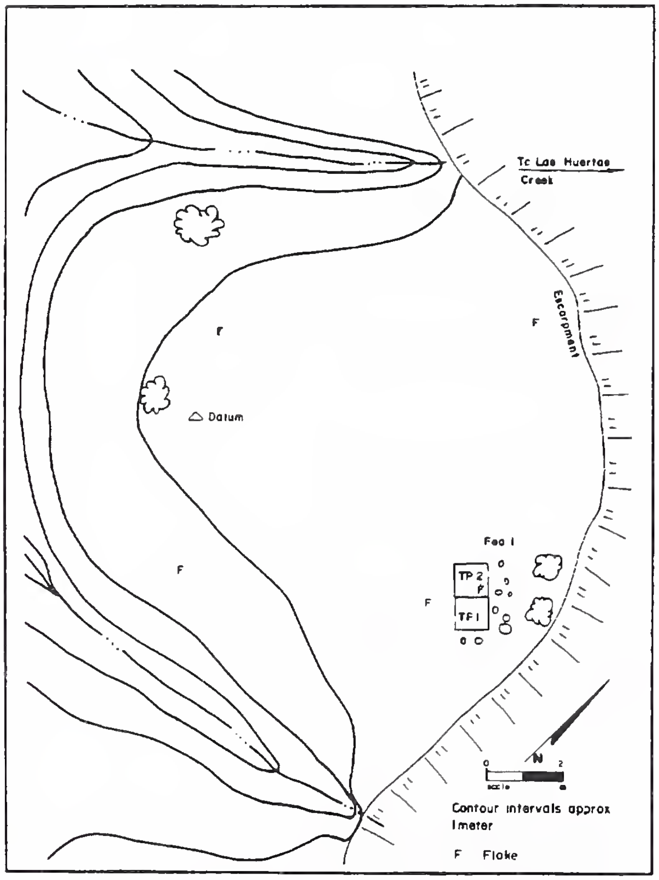
PL 34A was tested on February 2, 1982. All surface artifacts were pin flagged and the site photographed and mapped. A datum was established 11 meters west of the rock alignment. All surface artifacts were point provenienced in reference to the site datum. A two by one meter trench was placed along the long axis of the rock alignment. Eight shovel cut/auger tests were randomly placed over the site area.

Surface Description

The site area was approximately 120 square meters (Map 2-31). Six flakes were recovered during surface collection. The flakes were primary and secondary reduction of obsidian, basalt and chalcedony raw materials. Two possible cores and a piece of angular debris were also collected. Average surface artifact density was less than one item/square meter.

Subsurface Testing

The two by one meter trench was excavated as two 1 square meters units. Excavation was continued to 15 centimeters below ground surface, at which point the underlying Santa Fe gravel formation halted digging. Three basalt flakes were recovered from top ten centimeters of the trench. More rock, which appeared to be associated with the rock alignment, was also observed. It was concluded that the rock alignment was a naturally occurring exposure of the Santa Fe gravel formation. The reasoning behind this conclusion was the highly variable size of the associated cobbles, i.e., 5-40 cent meters in length. Known structures in the area tend t have more uniformity in rock size. No artifacts wei recovered from the eight shovel cut/auger tests, and n features were revealed.



Map 2-31. Site PL 34A.

Samples Analyzed

Four obsidian flakes found on the surface were submi ted to the U.C.L.A. Obsidian Hydration Laborator where hydration rind thickness determinations wei carried out. Source determination for each of the fo samples, carried out by Forest Service personnel, was t macroscopic inspection only. The effective hydratio temperature and inferred age of each sample wei calculated, following Michels' (1984d, 1985) procedur and induced hydration rate determinations. Hydratio temperature, as for the Atrisco samples (refer to th discussion in "Comments," site AT 3B above) were base on Albuquerque weather records.

Flakes analyzed were selected from Field Specimens 4: 44, 45, and 47. Specimen 43, judged to be of Obsidia Ridge-Rabbit Mountain (codes 3520-3525), had a rir thickness of 6.2 microns and an inferred productio date of 1646 B.C. Specimen 44 was judged to be of th same material; it had a rind of 3.7 microns and a inferred production date of A.D. 692. Specimen 47, the same material also, had a rind of 3.3 microns and a inferred date of A.D. 956. Specimen 45, judged to be Polvadera obsidian (code 3530), had a rind of 7.6 m crons and an inferred age of 2817 B.C.

Because these estimates are from surface-collected ol sidians which were visually sourced, they are less tha fully reliable. However, the senior author has found th Polvadera obsidian can be reliably identified by inspe tion if the Polvadera morph represented is of the typic form, as defined for code 3530. The date for Specime 45 may be reasonably accurate. The other items cou be Cerro del Medio (code 3500?), which is known occur in a morph indistinguishable by inspection fro code 3520-3525. If so, then Specimens 43, 44, and 4 would date, respectively, to 4068 B.C., 162 B.C., ar A.D. 270. Whichever dates are more correct, the calculations suggest that a multi-component scatter represented.

Comments

PL 34A appeared to have been a small lithic reductic site, as are numerous others along the mesas ar arroyos bounding Las Huertas Creek. Dating of the si is tentative, based on the possible Archaic projecti point and on the bulk of obsidian age estimates. The si could also have been utilized at a later date; the surface-collected obsidian samples may be systematically over-hydrated as a consequence of solar and brush-fire exposures. The L-shaped rock alignment was also problematic, and the excavators concluded that it was probably a natural erosional occurrence from the Santa Fe gravel beds underlying the site.

Site PL 35A

Site PL 35A is a lithic scatter with the remains of a possible rock structure. The site is located on a low mesa bordering the west bank of Las Huertas Creek in Township 13N, Range 4E, of Section 14. It is only a few meters north of PL 34A and approximately 60 meters east-northeast of the creek. The site is situated on the mesa edge in a sandy, deflated area with some small erosion channels. Vegetation at the site was juniper and bunch grasses. The general slope of the site is to the east down into Las Huertas Creek. Elevation of the site is 5320 feet (1620 meters).

Survey and Testing

Survey observations indicated that the site was a light lithic scatter with a circular arrangement of rocks, which were possibly the remains of a structure. All observed surface artifacts were collected. These were flakes of basalt, chert, and obsidian. Erosion, in the form of deflation and sheet wash, had affected the site to some extent. Research potential was indeterminate.

Testing of the site was initiated by pin flagging all surface artifacts and mapping and photographing the site area. A datum was located in the center of the site and all surface artifacts were point provenienced and collected in relation to the datum. A one by two meter test trench was excavated within the circular rock arrangement. The test trench was excavated in four arbitrary ten centimeters levels. Four random shovel cut/auger tests were also placed within the rock feature, with another six tests randomly placed across the site.

Surface Description

Surface artifact density was extremely light across the 400 square meters of the site (Map 2-32). The artifacts were eight primary and secondary reduction flakes, one core fragment, and a biface. Lithic raw materials were basalt and obsidian. The rock arrangement consisted of 11 cobbles encompassing a 4.5 square meters area.

Subsurface Testing

The test trench within the rock arrangement (Fig. 2-20) was excavated as two 1 meter square units and taken to a depth of 40 centimeters below surface. Sediments encountered in the test trench were a sandy loam with caliche nodules present. Excavation was stopped when the Santa Fe formation gravels were reached. No cultural materials or indications of cultural activity were recovered or observed in the test trench. The ten shovel cut and auger tests likewise revealed no artifacts or subsurface remains.

Samples Analyzed

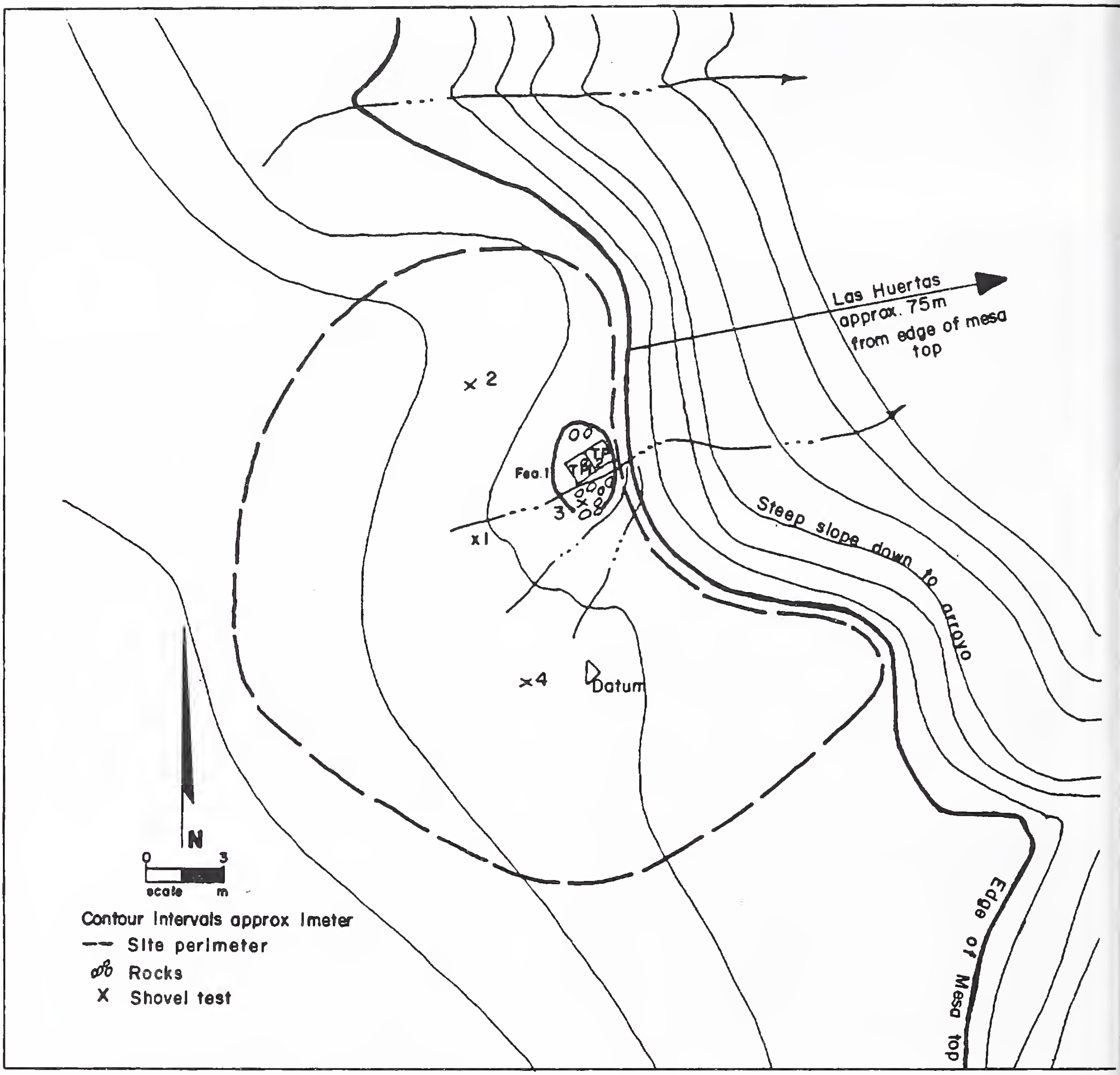
Four obsidian samples were dated using the same procedures described in discussion of PL 34A above. The samples, from Field Specimens 1, 17, 19, and 21, were judged to be of material codes 3530 (Polvadera), 3525 (Obsidian Ridge-Rabbit Mountain), 3500 (Cerro del Medio?), and 3523 (unknown source locus) respectively. Hydration rinds and inferred ages for each were, in order: 6.2 microns and 1211 B.C.; 6.7 microns and 2255 B.C.; 6.8 microns and 4877 B.C.; 6.0 microns and 3119 B.C. If the items were incorrectly sourced in such a way as to yield the maximum dating error (Obsidian Ridge as Cerro del Medio and vice-versa), then the date for Specimen 17 would be 5175 B.C. The dates for specimens 19 and 21 would be 2441 B.C. and 1461 B.C., respectively. Under any interpretation, the lithic scatter thus appears to be of early or middle Archaic age. The reader is cautioned, again, that obsidian hydration dates from surface materials are not reliable, tending in general to be too old by as much as 50 percent or more.

Comments

Site PL 35A appeared to be a lithic reduction activity area of limited utilization. The circular rock arrangement remains problematic, as there was no evidence to either confirm that it had been a culturally-produced feature or that it was a natural phenomenon derived from the Santa Fe gravel formation. The age of the site was also indeterminate; probably an Archaic component is present, based on obsidian hydration.

Site PL 40A

Site PL 40A is a lithic/ceramic scatter with an associated two room structure. The site is located on the west bank of Las Huertas Creek, which is approximately 40 meters to the northeast, in Township 13N, Range 4E, Section



Map 2-32. Site PL 35A.

24. The elevation of the site is 5400 feet (1644 meters). On-site vegetation included bunch grass, rabbitbrush, sage, snakeweed, and juniper.

Survey and Testing

PL 40A was characterized as a lithic scatter with a possible stone structure consisting of one large room with a smaller room located immediately to the south juniper was noted growing out of the center of the lar room. Observed and collected lithics were chert fla A large, white boulder with a possibly modern petrog was noted approximately 25 meters to the south of room block. A road on the west side of the site destroyed an indeterminate portion of the site.

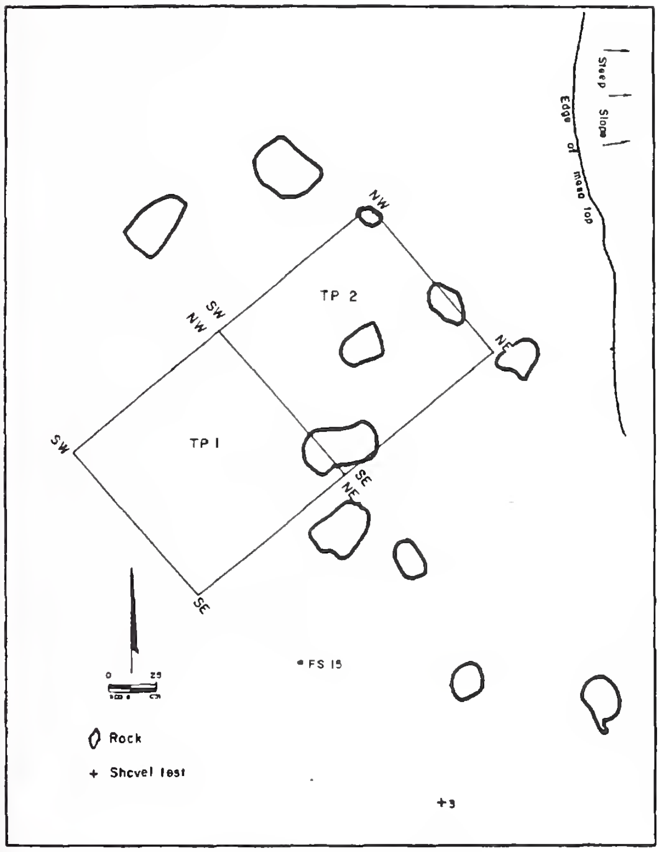


Figure 2-20. Test pits 1 and 2 in Site PL 35A.

A site datum was established with a 30 meters long baseline extending from it at a bearing of 320 degrees. The baseline bisected Feature 1 (the possible structure). All surface artifacts were pin flagged; the site was photographed and mapped. The site area was also stratified by nine 2 by 20 meters units which provided provenience coverage over the entire site. All surface artifacts were point provenienced and collected by triangulation from the baseline.

Twelve excavation units were established: one 1 by 1 meter (Unit 1), one 1 by .5 meter (Unit 2), four 2 by 2 meters (Units 3-6), and six 2 by 1 meter (Units 7-12). Units 1 and 2 were positioned to provide subsurface information on Feature 1. Unit 1 was excavated to 50 centimeters below the site surface. Only the western half of Unit 2 was excavated because of time restrictions, but was taken down 50 centimeters below surface also. The remaining units (3-12) were all excavated to depths of 20 to 60 centimeters below the site surface. Four shovel cut and auger tests of 30 centimeters depth were placed within and adjacent to Feature 2.

Surface Description

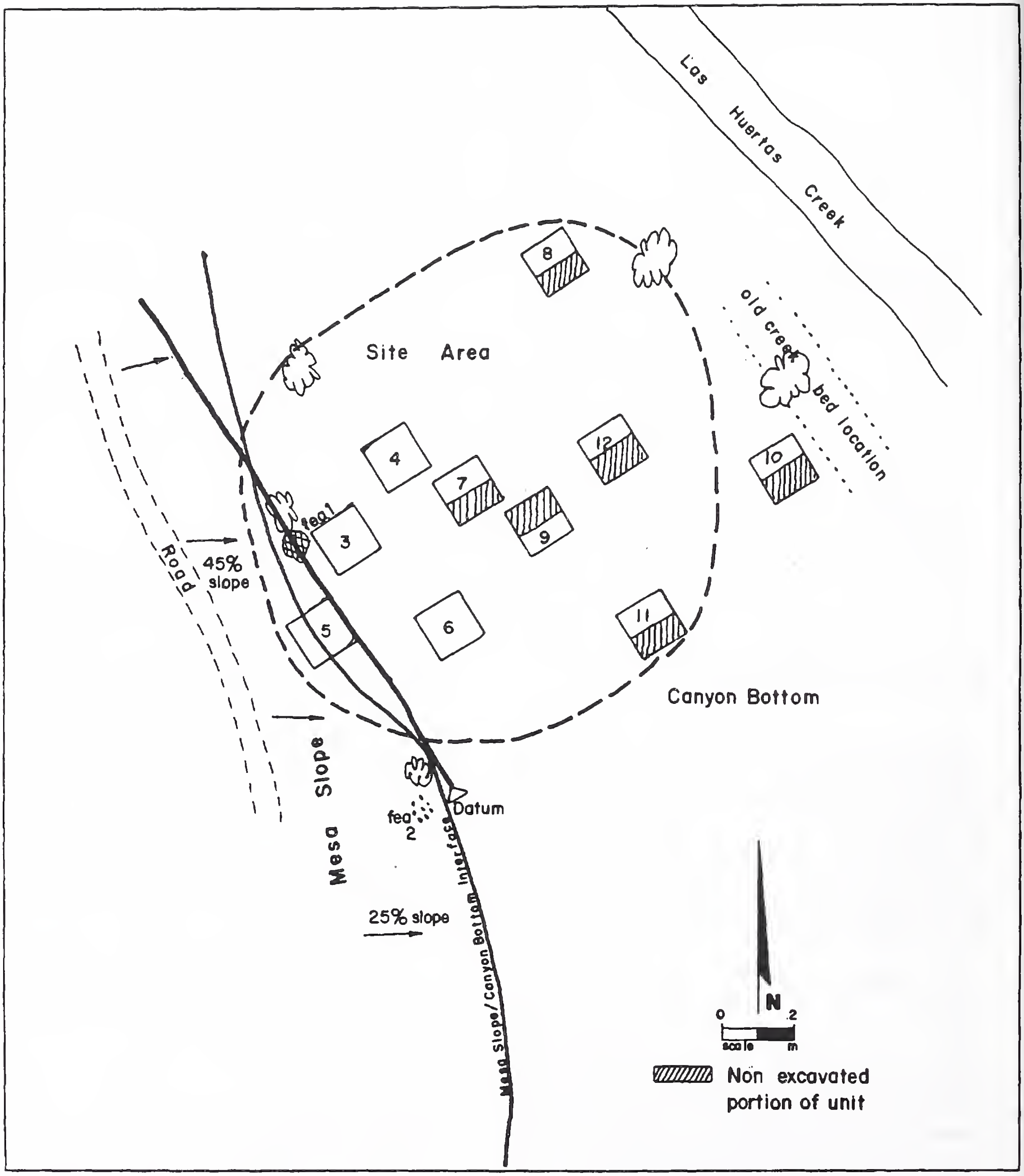
Site PL 40A proved to be a lithic scatter with evidence of a possible structure (Feature 1) constructed of large cobbles (Map 2-33). A plan view (Fig. 2-21) of the possible structure revealed a somewhat rectilinear arrangement of the cobbles, but exact definition of rooms or walls was uncertain. The dimensions of the rock arrangement were 3.5 by 1.5 meters for the larger alignment, and 1.25 by 0.3 meters for the smaller group of rocks. A concentration of rocks (Feature 2) was recorded approximately 14 meters to the south of Feature 1. Colluvial disturbance emanating from the road on the site had affected Feature 1, as had the juniper tree growing in the center of the feature.

Surface collection netted several flakes, a projectile point tip, and a tabular piece of groundstone. Lithic raw material was obsidian and chalcedony. No ceramics were recovered during surface collection. The site area was approximately 300 square meters

Subsurface Testing

Test Pit units 1 and 2 were excavated to provide subsurface information on Feature 1, the rock alignment. In Unit 1, three natural strata were defined over a depth of 50 centimeters below ground surface (Fig. 2-22). Below 50 centimeters was a culturally sterile stratum. Stratum A was an uncompacted loamy sand/pebble layer approximately 14 centimeters thick, interpreted as colluvial sediments derived from the road. No artifacts were recovered. Stratum B was a loamy sand with gravel and large cobbles and charcoal flecks. Although the large cobbles were presumed to be structural remains, they were randomly distributed in this stratum. Stratum B was some 45 centimeters thick. It contained 18 sherds, 19 flakes, and a bone fragment. Pollen and flotation samples were extracted. Considerable colluvial disturbance of the sediments which was not attributable to road construction was noted; i.e., the disturbance was probably prehistoric. Stratum C was a compact, silty, clayey sand with pea gravel, lumps of clay and charcoal flecks. This stratum was approximately 20 centimeters thick. Three flakes and one sherd were collected from the upper ten centimeters of the stratum. The bottom ten centimeters appeared to be a pre-occupation horizon.

Test Pit 2, upslope from Unit 1, was also excavated to a depth of 50 centimeters below the surface. Only half of the unit was excavated. Five natural strata were defined (Fig. 2-23). Stratum A was defined as the surficial duff; it consisted of uncompacted loamy sand and gravel. The stratum was 15 centimeters thick. No artifacts were recovered. Stratum B was also 15 centimeters thick; it



Map 2-33. Site PL 40A.

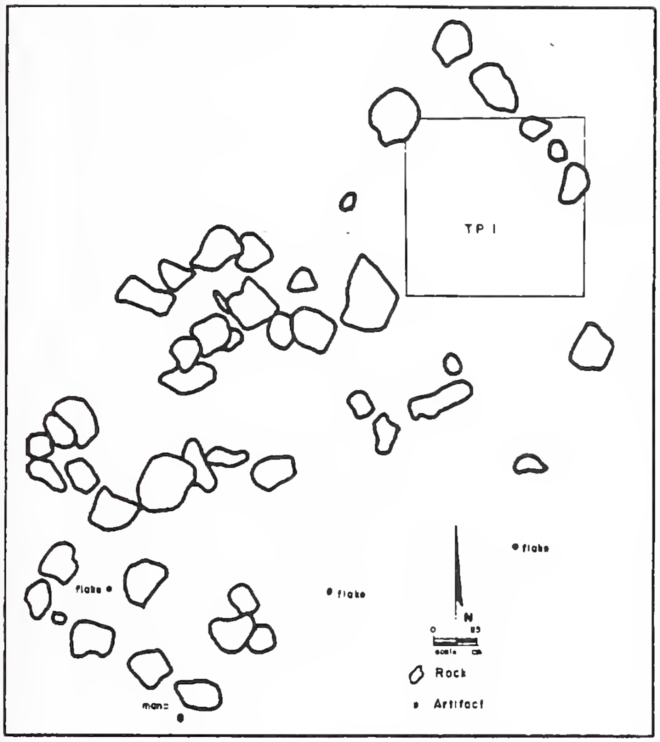


Figure 2-21. Evidence of a structure at Site PL 40A.

corresponded to Stratum A in Unit 1. Sediments were the same as stratum A; no cultural materials were observed. Stratum C (equivalent to Stratum B in Unit 1) consisted of loamy sand with occasional large cobbles, gravel, and charcoal flecks. The cobbles were probably disarticulated structural remains. This 15-centimeters thick stratum was also colluvial in origin. It contained ten flakes and four sherds. Stratum D was brown silty sand with pebbles and charcoal flecks. This stratum was not present in Unit 1. Ten flakes and three sherds were collected. The stratum was 20 centimeters thick. Stratum E (Stratum C of Unit 1) was a silty, clayey sand with pea gravel, lumps of clay, and charcoal flecks. It appeared to be sterile.

Of the remaining test pits, Units 10 and 12 were sterile. Units 3 - 9 and 11 contained lithic debitage, sherds, and groundstone. A radiocarbon sample was collected from Unit 5. It was noted that artifacts were recovered mainly from the first 30 centimeters below ground surface, although several artifacts were recovered from as deep as 60 centimeters below surface. The subsurface artifact distribution also seemed to be confined to a ten meters radius around Feature 1.

The testing of Feature 2 involved placement of four 30 centimeters-deep shovel cuts in and around it. No artifacts or indications of prehistoric occupation were recovered.

Analyzed Samples

Warren and Warren (this volume) analyzed the ceramic assemblage from PL 40A. Six ceramic types were recognized: Kiatuthlanna B/w, Gallup B/w, Kwahe'e B/w, Santa Fe B/w, Tusayan (Mancos) Corrugated, and an unknown redware. Of the painted wares all but the Santa Fe B/w fall into the Pueblo II period, i.e., A.D. 900 to 1150. The corrugated ware dated from A.D. 950 to 1300. Warren saw no evidence from the ceramics indicating more than one occupation.

Bertram (this volume) analyzed the bone from PL 40A. He observed one fragment the size of *Sylvilagus* sp., rodent skull fragments representing possibly two individuals, and four (fresh water?) mussel shell fragments with possible cultural modification.

Comments

The ceramic analysis indicates that the occupation of PL 40A took place during the Pueblo II period, i.e., A.D. 900 to 1150, and perhaps as late as A.D. 1300. Artifactual evidence (groundstone and ceramics) demonstrates that lithic reduction and possibly food processing activities took place at the site. The occupation appears to have

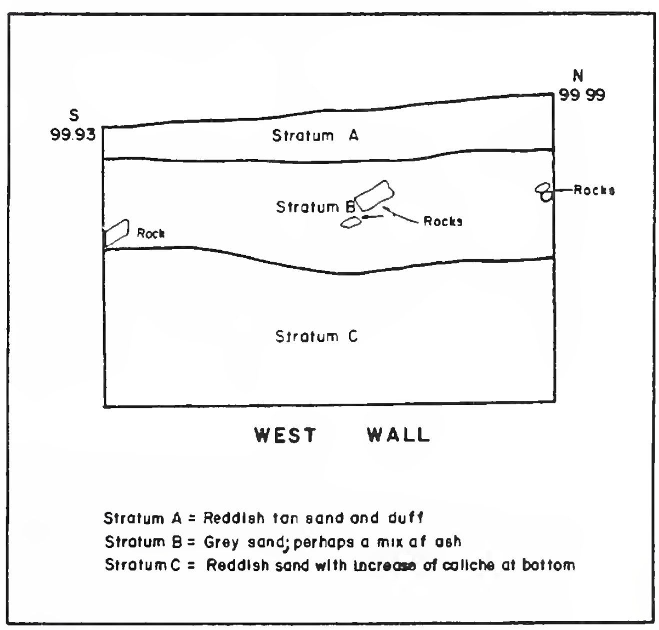


Figure 2-22. Stratigraphy of Test Pit 1 in Site PL 40A.

been of short duration. Possible structural remains (Feature 1) suggests a potential field house, given the proximity of the site to land suitable for horticulture. The function of Feature 2 is indeterminate, although testing notes suggest that it may have been a collapsed stone cairn.

Site PL 50A

Site PL 50A evidenced structural remains, but had no surface artifacts. PL 50A is located on Las Huertas Creek only a few hundred meters north of PL 34A and PL 35A, and several hundred meters west of PL 24A, in Township 13, Range 4E, Section 14. The site is situated on an island in the creek bed at an elevation of 5240 feet (1596 meters). Observed vegetation included bunch grasses, rabbitbrush, sage, snakeweed, and sparse juniper.

Survey and Testing

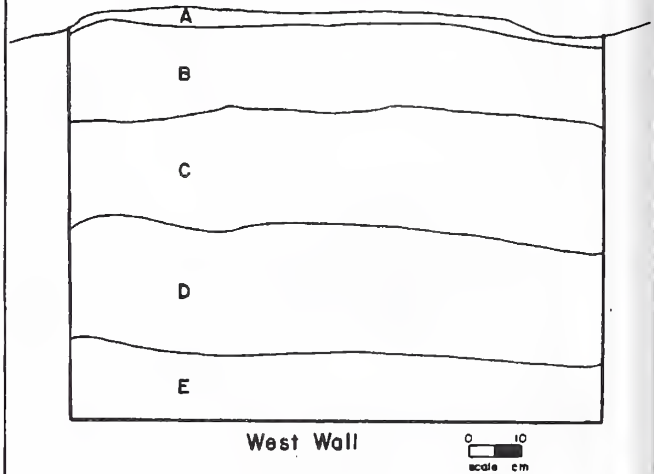
Survey notes describe the site as a masonry room built of cobbles, and approximately ten square meters in area. No surface artifacts were observed. Erosion appeared to have affected the site heavily. A large juniper was growing from the center of the structural feature. The site was thought to relate to horticultural activities sometime during the Pueblo III - IV periods.

The site was tested on March 4, 1982. A 15 meters baseline was established along the axis of the south wall of the structure on a bearing of 310 degrees (true north) from the site datum. A shovel scrape was extended 50 centimeters out from the edges of the visible structure to clear away the duff. Probing of that area revealed more structural remains. Exposed stones were then mapped and photographed.

Excavation began by placing a one by two meters (Units 1 and 2) trench within the southern portion of the structure. A one by one meter test unit (Unit 3) was placed between the north wall of the structure and a slightly curvilinear arrangement of rocks. Four units measuring two by two meters (Units 4-7) were positioned to the east and west of the structure.

Surface Description

The stone structure evident on the surface measured approximately two by two meters (Map 2-34). Before shovel scraping and removal of the duff only the southern wall of the structure was visible. No artifacts were observed on the surface.



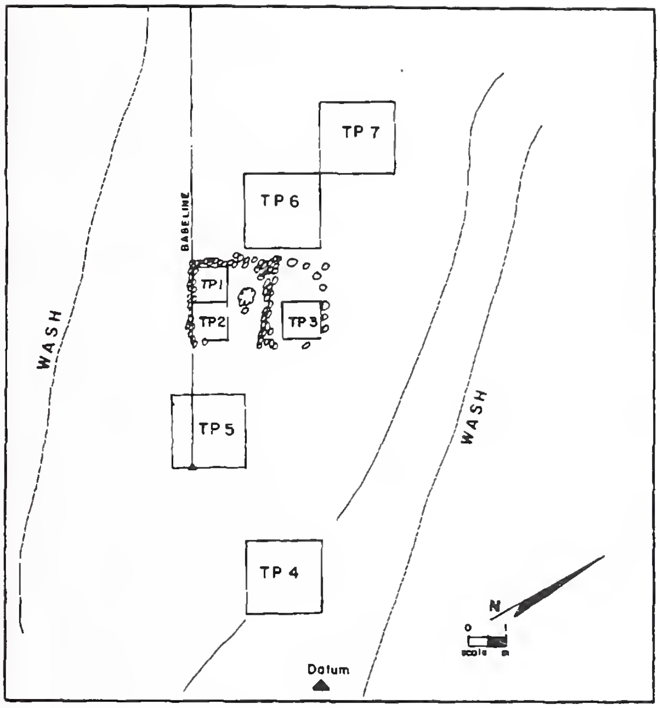
A. Juniper duff and organic material
B. Reddish brown fine grain sand and unsorted rocks with charcoal flecks
C. Greyish brown medium grain sand with unsorted rocks and some larger rocks. Small pieces of charcoal and flecks.
D. Medium grained light brown sand and unsorted rock with charcoal flecks.
E. Tan hard soil with clay content. No charcoal. Some unsorted rocks.

Figure 2-23. Stratigraphy of Test Pit 2, Site PL 40A.

Subsurface Testing

The shovel scrape and probing revealed the presence (relatively intact northern, southern, and western walls (the structure. Although there was a cobble scatter withi and to the immediate southeast of the structure it coul not be ascertained if this was the remains of an easter wall. Also uncovered during the shovel scrape was slightly curvilinear arrangement of large rocks locate approximately 1.5 meters east of the structure. Th arrangement was some 12 meters long.

Units 1 and 2 were excavated by removing the duff. The the matrix was dug in three 10 centimeters arbitrar levels. Final excavated depth of the units was 35 cent meters below ground surface. Matrix sediment wa sandy loam. Cultural materials consisting of two seconc ary basalt flakes and a bone fragment were retrieved at depth of approximately 20 centimeters below the groun surface. Adobe chunks between two of the structur rocks were recovered in the northern profile of the unit and were collected as a pollen sample. A flotation sampl was also recovered from Test Unit 1. The undifferentiate matrix revealed no natural strata or living surface. Th northern profile was mapped and photographed. Th



Map 2-34. Site PL 50A.

bottom of Units 1 and 2 were then auger tested another 20 centimeters below the surface with no recovery or indication of cultural materials.

Test Unit 3 was placed between the structure's northern wall and the curvilinear rock arrangement. Excavation proceeded in three 10 centimeters arbitrary levels. The bottom of the unit was then auger tested to 50 centimeters total depth. Unit 3 was sterile.

Test Units 4 and 5 were randomly placed approximately at six meters and 1.5 meters, respectively, from the southeast corner of the structure. Both units were taken down 20 centimeters below surface. A small tertiary flake was recovered from each unit. Charcoal flecking was observed in both units. A possible squash seed was recovered from Test Unit 5 at an approximate depth of ten centimeters below ground surface.

Test Units 6 and 7 were randomly located immediately north-northwest of the structure. A mollusk shell, a bone fragment, and a basalt flake were recovered from Unit 6. Unit 7 was sterile. Charcoal flecking was noted in both units. Further auger testing of Units 6 and 7 revealed no other cultural materials.

Sediments in all test pits were fine grained, lightly compacted sands, alluvial in origin.

Comments

Site PL 50A represents the remains of a three-sided rock structure with an associated curvilinear rock alignment. It was suggested that these structural features were a field house and retaining wall. However, given the dearth of cultural materials, determination of the prehistoric activities conducted at the site is difficult. It was noted that site PL 32A also had a rock alignment similar to the retaining wall at PL 50A. Erosion appeared to have damaged the site, perhaps partially explaining why so little cultural material was found.

Site PL 51A

This site was a chipped stone artifact scatter with a concentration of large rocks. Site PL 51A is located in Township 13N, Range 4E, Section 14. The site was situated on a ridge extending west from a mesa into the canyon of Las Huertas Creek at an elevation of 5300 feet (1614 meters). Arroyo headcutting was extensive on the northern side of the ridge; a shallow arroyo bounded the south side. Santa Fe gravels were eroding down onto the site from the higher mesa slope. Vegetation included bunch grasses, juniper, and yucca.

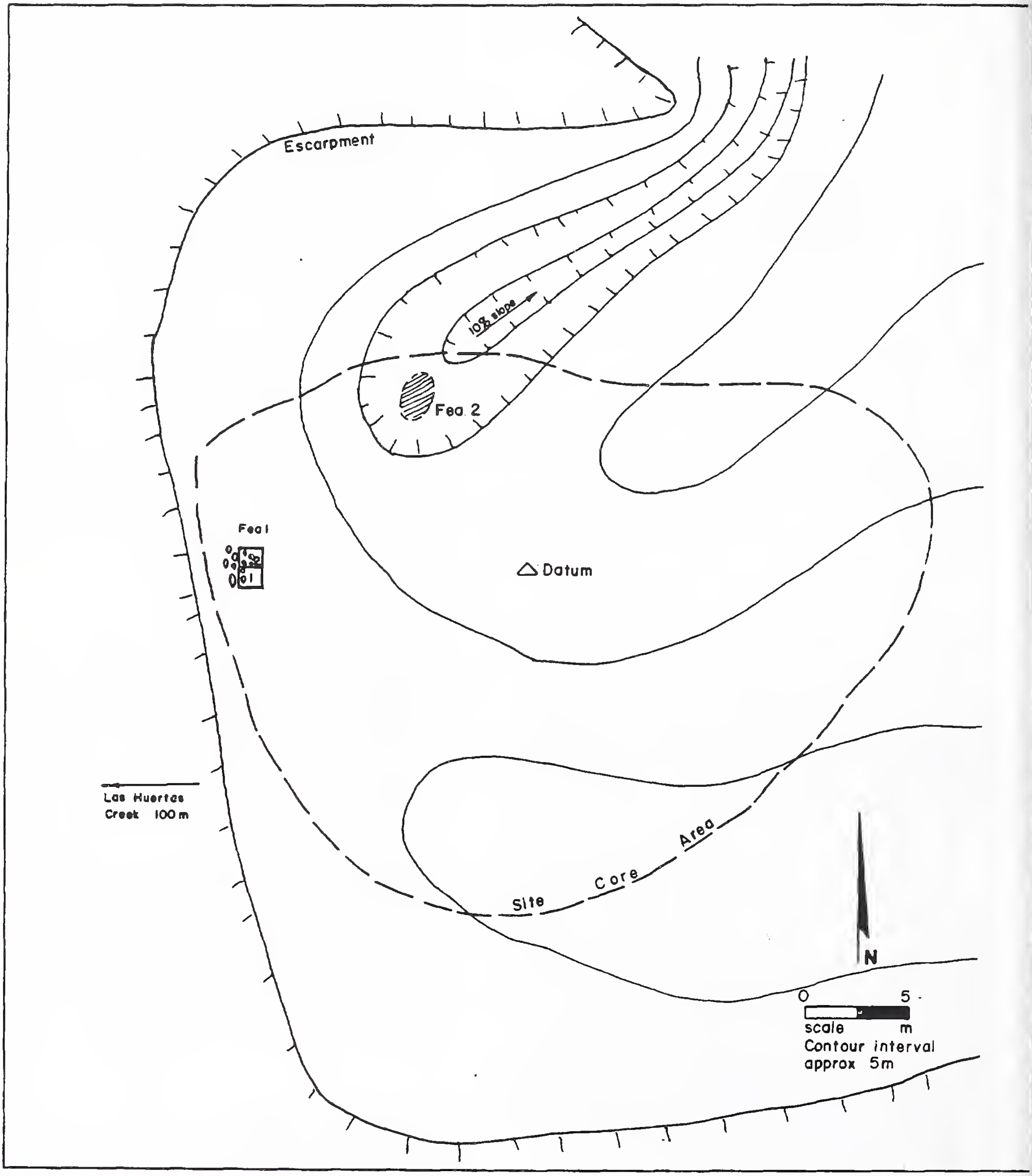
Survey and Testing

The survey description noted a light scatter of obsidian, chert, and basalt flakes covering an area of approximately 300 square meters. No sherds were observed. A concentration of large cobbles, one meter in diameter, was located near the edge of the ridge. Disturbance to the site was relatively light and the general site condition was considered good. Several chipped stone items were collected.

Testing of the site was conducted on February 26, 1982. Initially, all surface artifacts were pin flagged; the site was then photographed and mapped. A site datum was established in the center of the highest artifact density area. All surface artifacts were point-provenienced and collected. The cobble concentration was designated Feature 1. Formal excavation was limited to a one by two meters trench which bisected Feature 1. Numerous shovel cut and auger tests were randomly placed across the site.

Surface Description

Examination of the surface artifacts reveal predominantly secondary and tertiary reduction flakes and core fragments. Lithic raw materials were local cherts, chalcedonies and obsidian. The area of artifact scatter



Map 2-35. Site PL 51A.

was determined to be approximately 1000 square meters (Map 2-35). A four square meters concentration of obsidian flakes was designated Feature 2 and was collected. A "KC" brand baking powder can was recovered from the surface.

Subsurface Testing

The test trench was divided into two one by one meter units (Test Pits 1 and 2). Both units were positioned in the eastern portion of Feature 1. The 12 rocks representing Feature 1 were mapped (Fig. 2-24). Test Pit 1 was excavated to 16 centimeters depth. Sediment was sand mixed with pebbles. Only two flakes were recovered from Test Pit 1. Test Pit 2 was excavated to a depth of ten centimeters below ground surface. Sediments were the same as Test Pit 1. Two obsidian flakes were recovered from this unit. No other cultural materials or large rocks were noted beneath the surface rocks of Feature 1. Both units were auger tested to a depth of 60 centimeters below ground surface. No cultural materials or indications were encountered in the auger tests.

Samples Analyzed

Eight obsidian items were subjected to analysis for dating following the procedures outlined in discussion of obsidian from PL 34A, above. All appear to have been from surface proveniences.

Materials represented, on visual sourcing, were judged to be code 3500 (Specimens 3 and 12), of code 3523 (Specimen 11), of codes 3520 and 3525 (Specimens 8, 10, and 21), and of code 3530 (Specimens 14 and 20). Specimen 14 proved to be undatable. Assuming correct sourcing, the rind thicknesses and dates of production for the seven dated specimens are: Specimen 3 (5.7 microns, 2837 B.C.); Specimen 12 (4.7 microns, 1293 B.C.); Specimen 11 (5.2 microns, 1849 B.C.), Specimen 8 (4.5 microns, A.D. 72); Specimen 10 (5.2 microns, 569 B.C.); Specimen 21 (5.9 microns, 1303 B.C.); and Specimen 20 (6.6 microns, 1636 B.C.).

If sourcing assessments were incorrect in a way that would most distort true ages, the dates would be: Specimen 3 at 1124 B.C.; Specimen 12 at 129 B.C.; Specimen 11 at 603 B.C.; Specimen 8 at 1245 B.C.; Specimen 10 at 2328 B.C.; and Specimen 21 at 3567 B.C. The Polvadera source identification for Specimen 20 is presumed correct. If the most extreme date options of this group are eliminated, the remaining dates appear to cluster in the neighborhood of 1850 to 1150 B.C. Perhaps this cluster provides an acceptable simplest inference, that the site was occupied for one or more episodes during the late middle Archaic.

Comments

Feature 1 did not appear to be structural. It was suggested that the rocks could represent a collapsed cairn of unknown function. Age of the site was indeterminate. Prehistoric activities at the site appear to have been limited to chipped stone tool manufacture, best dated by obsidian hydration from surface collections to the second millennium B.C. or later.

Site PL 5B

PL 5B was an extensive lithic scatter with a possible hearth. Site PL 5B is located in Township 13, Range 4E, Section 24, on a ridge top overlooking Las Huertas Creek approximately 400 meters to the southwest. The site elevation was 5580 feet (1699 meters). Vegetation on and around the site was bunch grasses, snakeweed, yucca and sparse juniper.

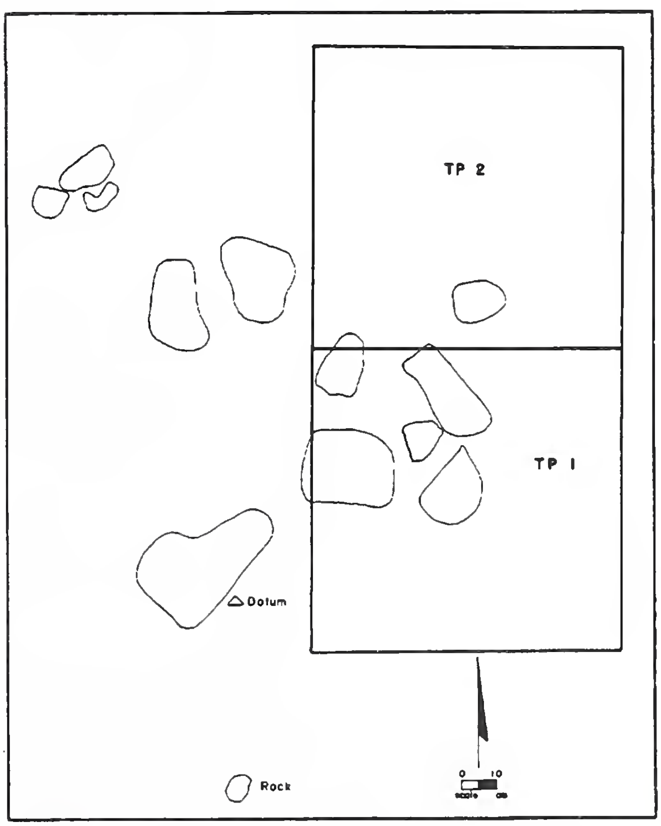
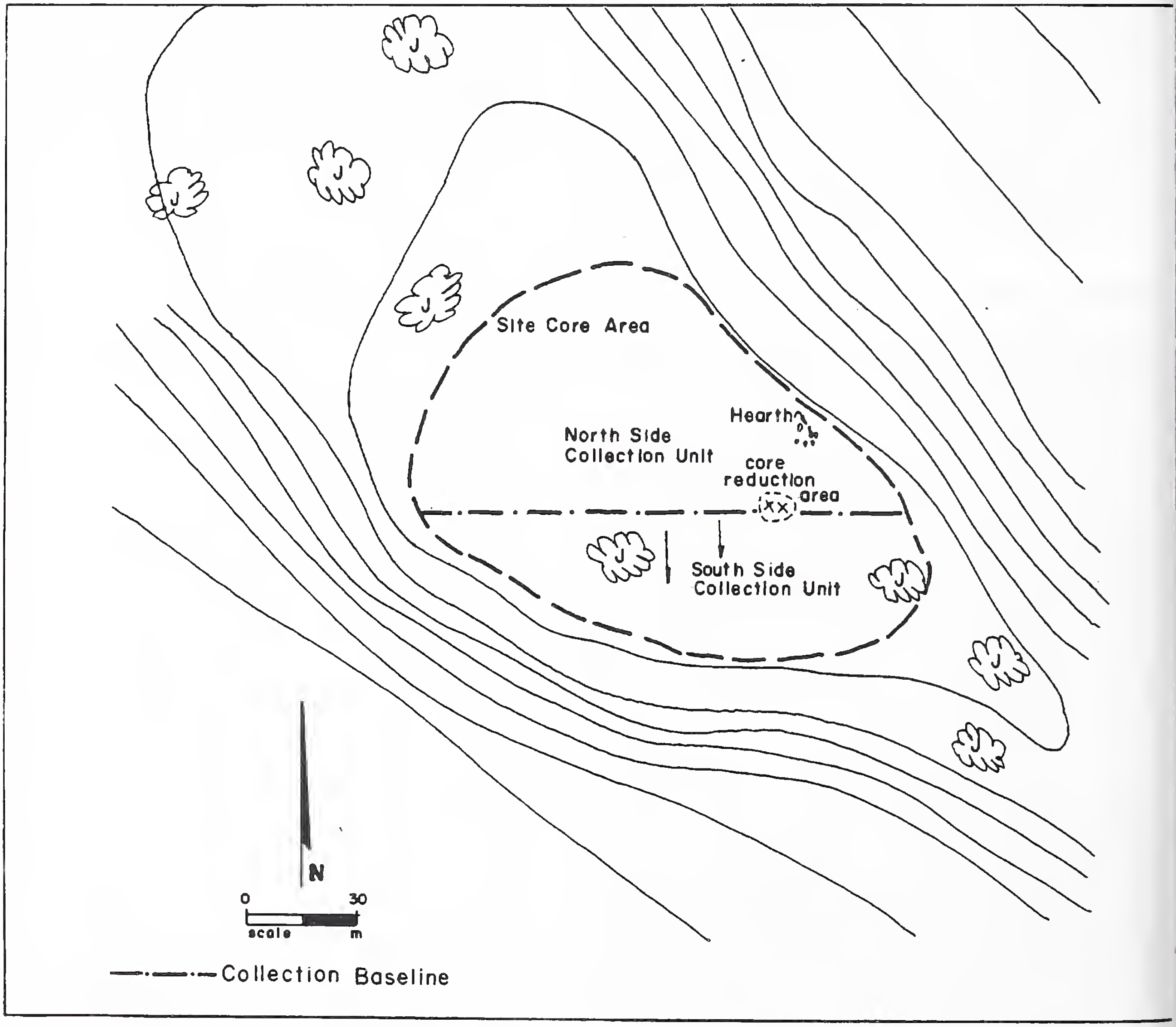


Figure 2-24. Site PL 51A, Feature 1.

Survey and Testing

PL 5B was heavily collected on survey. No ceramics were observed. Chipped stone artifacts collected included core fragments, flakes, two red chert bifaces, two broken obsidian projectile points, and an obsidian biface/projectile point fragment. Lithic raw materials noted were various cherts, chalcedonies and obsidian. A total of 77 artifacts was collected. A cluster of large rocks, possibly a hearth, was drawn and mapped. The site was heavily deflated. Research potential of this site was reported as indeterminate.

The site was tested on May 17, 1982. Surface artifacts were pin flagged and the general site area was mapped and photographed. An east-west line was established bisecting the site area; all artifacts were provenienced to the north or south of this line. Random shovel cuts were placed across the site area and in and around the possible hearth.



Map 2-36. Site PL 5B.

Surface Description

Surface inspection revealed a 4000 square meters lithic scatter with a possible hearth situated on the northeast edge of a ridge top (Map 2-36). The possible hearth had a diameter of approximately 50 centimeters. The site was underlain by exposed Santa Fe gravels. Lithic materials included a relatively high proportion of non-local cherts. Other materials included chalcedonies, cherts, obsidian, and basalt.

Surface artifact density proved out to be high, with over 200 chipped stone artifacts recovered. Formal chipped stone tools included: biface fragments, a possible burin, a large scraper, a possible Eden-type projectile point fragment and a Bajada-type projectile point fragment.

Subsurface Testing

The randomly placed shovel cuts revealed no cultural material.

Samples Analyzed

Nine obsidian hydration samples from this site were submitted for dating analysis, which followed the procedures outlined in the discussions for site AT 34A above. Of these, two had no discernible hydration band. The remaining seven, with their inferred material source codes, hydration thicknesses, and implied production dates, were: Specimen 55 (code 3500; 7.3 microns and 5923 B.C.); Specimen 57 (code 3520; 7.6 microns and 3470 B.C.); Specimen 1 (code 3525; 7.6 microns and 3470 B.C.); Specimen 58 (code 3525; 6.9 microns and 2512 B.C.); Specimen 63 (code 3525; 6.3 microns and 1764 B.C.); Specimen 62 (code 3523; 7.2 microns and 5364 B.C.); and Specimen 54 (code 3530; 7.4 microns and 2567 B.C.).

Had material sources been incorrectly identified in the manner that would most distort date estimates, the resulting estimates would have been as follows: Specimen 55 at 5100 B.P.; Specimen 57 at 9212 B.P.; Specimen 1 at 9212 B.P.; Specimen 58 at 7593 B.P.; Specimen 63 at 6330 B.P.; and Specimen 62 at 4962 B.P.

This analysis is, unfortunately, rendered somewhat suspect by typology and context. The site contained a typical Scallorn or Basketmaker III corner-notched arrow point, unlikely to be as old as the obsidian hydration readings. It, along with all other samples from this site, was a surface artifact. Under many common conditions of insolation, snow cover, and sheet-burning, artifacts from surface context can appear on the basis of hydration thicknesses to be as much as three or four times as old as their true ages (Bertram n.d.b). If this is the case for the PL 5B arrow point, it may be the case for all the artifacts from this site and, perhaps, for all the Placitas Sector surface obsidian samples discussed in this report.

The obsidian hydration data from PL 5B are ambiguous. The younger age suite listed above suggests occupation at 5500 to 4500 B.P., while the older suite suggests occupation at around 9210 to 7350 B.P. If the one Polvadera (code 3530) obsidian date is relied on as correctly sourced, then the younger suite is more acceptable. If one further assumed that the date for the arrow point was inflated by a factor of about four, by surface insolation and other effects, then one could justifiably recalibrate all the dates in the younger suite as ranging over the period of 1375 to 1125 B.P. Unfortunately, such sweeping recalibration is not as yet fully justified by knowledge of the dynamics of hydration.

Comments

PL 5B may be a PaleoIndian period (about 8900 to 8000 B.P.) site of indeterminate function, with reuse during the Early or Middle Archaic periods, based on the Eden and La Bajada projectile points. Depending on assumptions, the obsidian hydration dates can be viewed as concurring with the early typological dates. Alternatively, they can be construed as indicating a Basketmaker III-Pueblo I age for the assemblage or as dating entirely to the middle Archaic. Bertram, who carried out the obsidian dating re-analysis, leans toward the recalibrated Basketmaker-Pueblo date estimate, but the data are too ambiguous to allow strong support for any interpretation.

Site PL 25B

PL 25B was a small lithic and ceramic scatter with an L-shaped rock alignment. The site is located in Township 13N, Range 4E, Section 24, and is situated on a bench of the eastern slope (west bank of Las Huertas Creek) of a ridge which forms a drainage fork in Las Huertas Creek. The site is at an elevation of 5400 feet (1644 meters). Vegetation on and around the site consists of juniper, rabbitbrush, sage, Apache plume, snakeweed and bunch grasses.

Survey and Testing

The survey information on this site describes it as heavily eroded. No sherds were observed but a chalcedony flake and an obsidian flake were collected. The rock alignment was mapped. Also noted was an abundance of broken historic glass.

The site was tested between May 25 and June 7, 1982. Testing began with the installation of a site datum and pin flagging of surface artifacts. The rock alignment (Feature 1) and surface distribution of artifacts were mapped. Samples of chipped stone artifacts and sherds were surface collected at various areas on the site. A one by two meters test trench (Test Pits 1 and 2) was located within Feature 1; several auger tests were placed at various locations around the site.

Surface Description

Examination of surface artifacts revealed that many of the chipped stone pieces were tertiary flakes. However, primary and secondary flakes, core fragments, angular debris, groundstone, and Lino Gray sherds were also noted. Lithic raw material was predominantly chert, with representation of chalcedony, vitrophyre, limestone, siltstone, hornfels, quartzite, and obsidian. Brown and clear broken glass was also observed next to Feature 1 (Fig. 2-25). Artifacts were found mainly to the north and west of Feature 1 (Map 2-37).

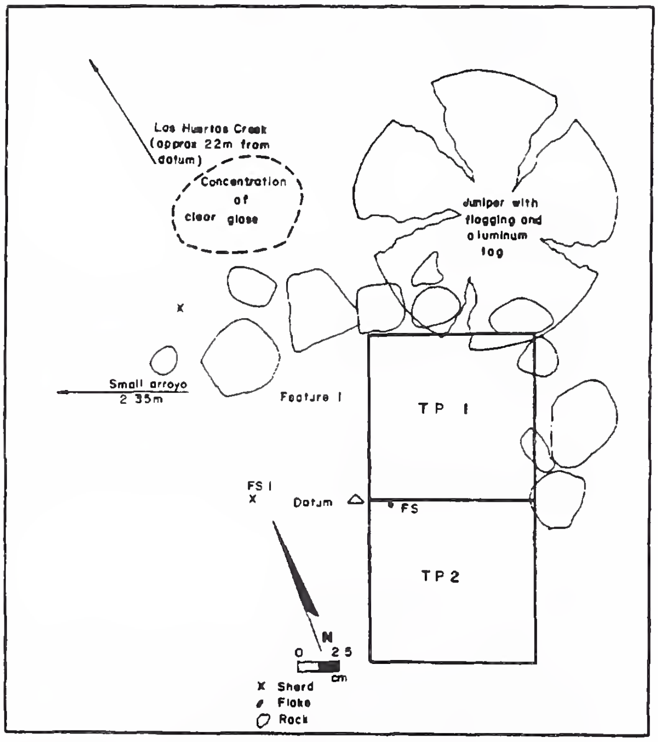


Figure 2-25. Area of Feature 1 at Site PL 25B.

Subsurface Testing

Subsurface testing began in Feature 1, Test Pit 1. Excavation proceeded in ten centimeters arbitrary levels; where discernible, natural strata were defined and described. Once stratigraphic profiles had been recorded for Test Pit 1, excavation of Test Pit 2 proceeded in natural strata. Three strata were delineated and described (Fig. 2-26).

Stratum A appeared to represent colluvial sediment of a light brown silty sand, deposited largely after the site was occupied. However, accumulation of the stratum had already begun when Feature 1 was constructed. The rocks of Feature 1 lay entirely within Stratum A. The stratum was 10 to 13 centimeters thick.

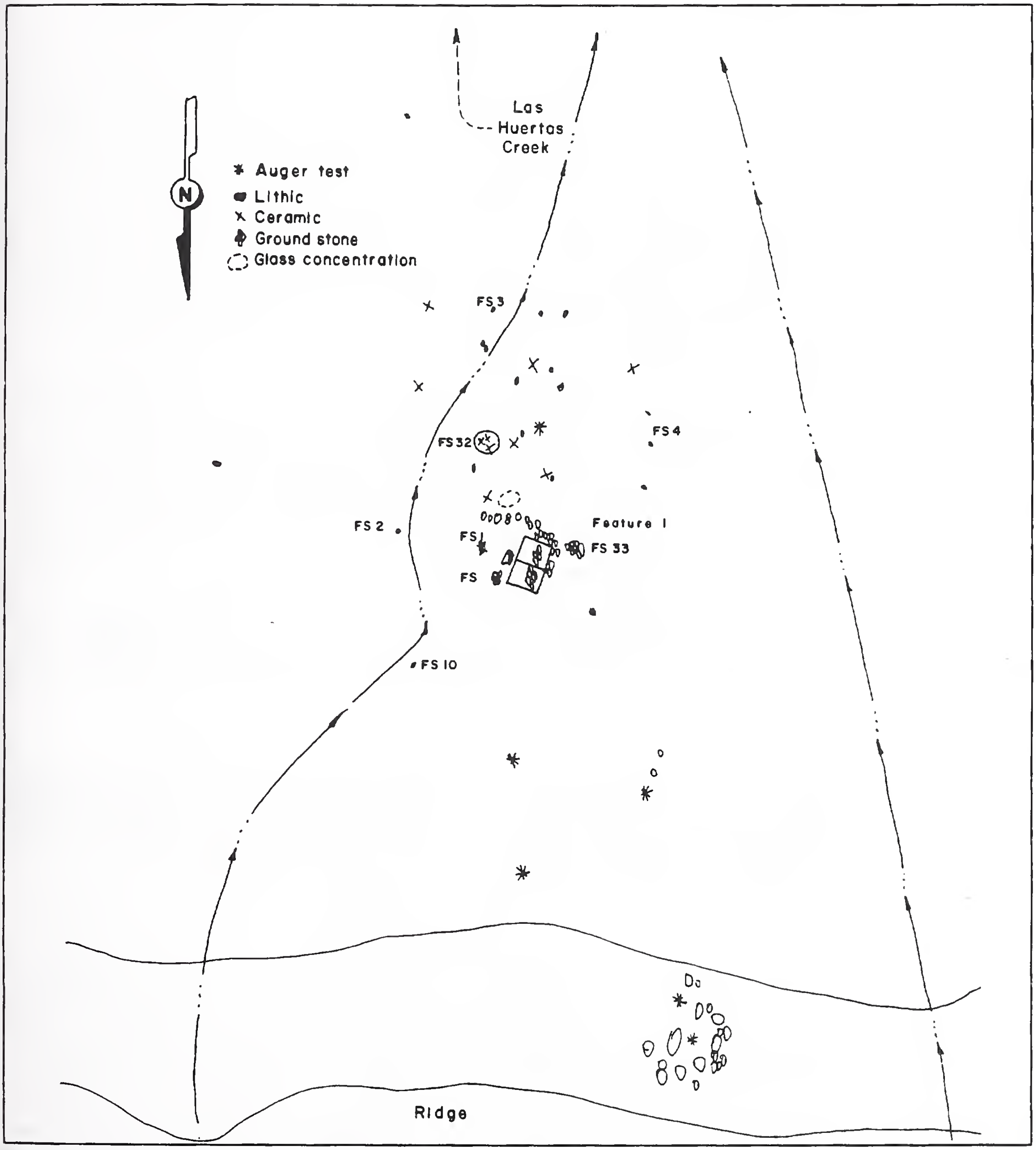
Chipped stone artifacts recovered from Stratum A were predominantly unutilized secondary and tertiary flakes of chalcedony, basalt, chert, and obsidian. There was no indication of an occupation surface.

Stratum B was a light grayish brown silty sand with pebbles some 30 to 40 centimeters thick (40 to 50 centimeters below ground surface). There appeared to be considerable bioturbation with sediments from Stratum A mixed with Stratum B. Artifacts recovered from Stratum B were largely secondary and tertiary flakes of basalt, chalcedony, chert, and obsidian. A tabular fragment of groundstone and over 15 grayware sherds were also recovered. Corn cob fragments, a radiocarbon sample, and a flotation sample were taken from Stratum B.

Stratum C was a light brown silty sand with a gradual transition from Stratum B. Charcoal flecking was evident only in the upper transition zone. Bioturbation in the form of roots and rodent burrows had mixed sediments from Strata A and B with those of Stratum C. Artifact frequency began to drop off with increasing depth in Stratum C. Chipped stone flakes and pottery sherds were recovered. The bottom of the test trench was augered an additional 30 centimeters with no recovery of cultural materials.

It was suggested at the time of excavation that much of the deposition of the test trench matrix was due to colluvial action and bioturbation, and that the strata did not represent discrete cultural levels. However, the indications were that the site had been utilized prior to the construction of Feature 1.

Seven auger tests were made to a depth of 35 to ... centimeters below ground surface. Six of these were sterile. A grayware sherd was retrieved from the seventh, which was located immediately east of Feature ... The sherd was found approximately 30 centimet...



Map 2-37. Site PL 25B.

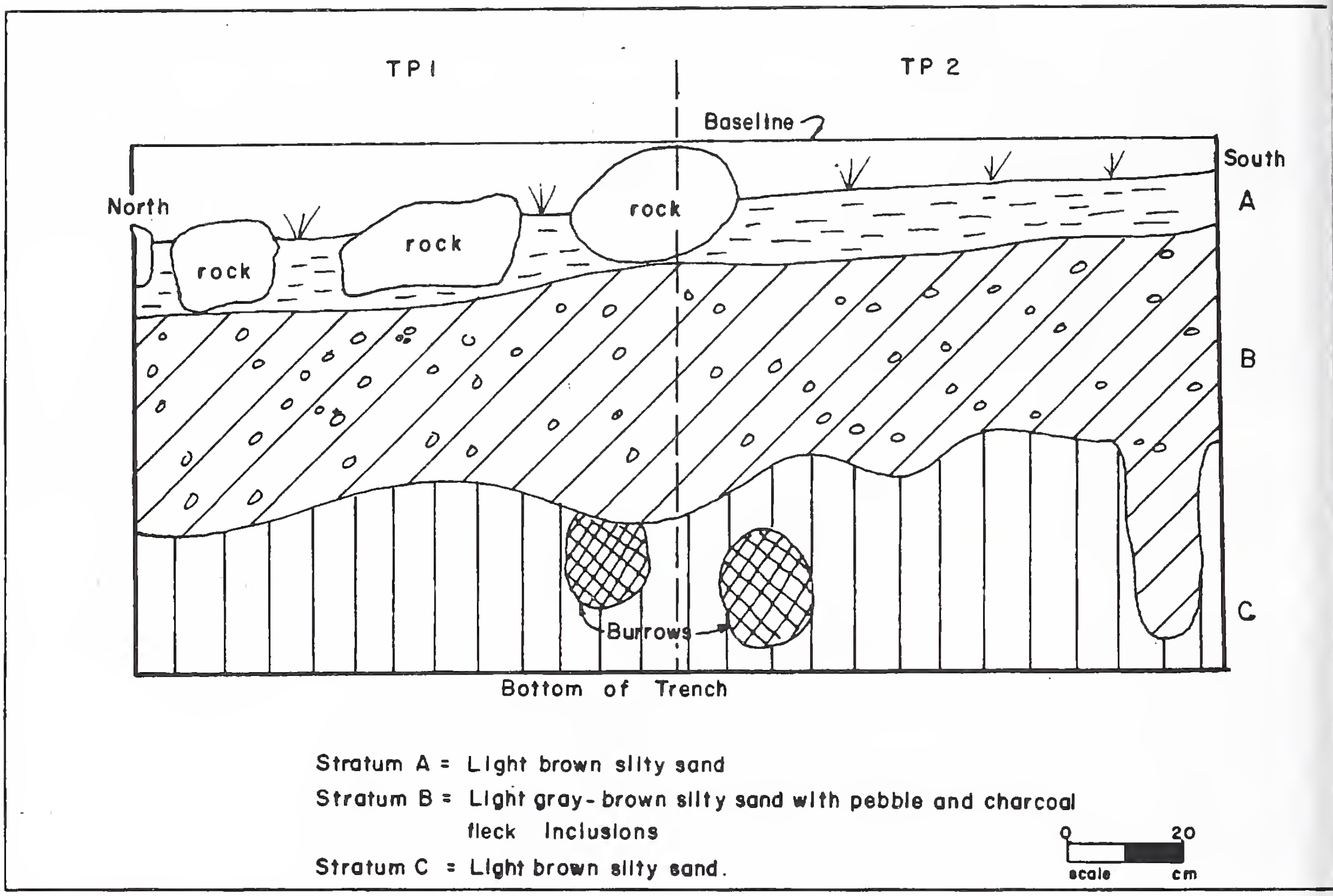


Figure 2-26. Test Pits 1 and 2 north-south stratigraphy in Site PL 25B.

below ground surface. Two of the sterile auger tests were made approximately 14 meters to the southeast of Feature 1 in a rock concentration which could have been another feature. However, no cultural materials were recovered from the surface of this area; its identification as a culturally-produced feature was ambiguous.

Samples Analyzed

No record of analysis for the ceramics reported from this site was located.

A single obsidian flake was analyzed from this site, using the methods outlined above in discussion of obsidian dating for PL 34A. This item, Specimen 1, is thought to be the flake collected on survey. It was judged to be of the highly distinctive, typical Polvadera obsidian (class 3530); its hydration rind thickness was 6.2 microns. Based on these data, its inferred date of production would be 3195 B.P. As the flake seems to have been collected from the surface, this date is suspect for the reasons outlined in discussions of obsidian from PL ! above; the flake may be as young as 800 B.P. T inferred date cannot be taken as evidence of occupati prior to the Basketmaker III occupation which deposit the grayware sherds also recovered.

Comments

The activities that occurred prehistorically at PL 2 involved chipped stone reduction and possibly fo processing, inferred from the presence of potte groundstone, and corn cob fragments. The age a duration of occupation is problematic because L graywares were produced over a period of several hu dred years. Interpretation is further complicated evidence that considerable natural disturbance to place at the site. The presence of a possible structu and a possible feature may indicate that the site w used extensively through time. Intensive use is su gested by the relatively high frequency of subsurfa artifacts.

Conclusions: Placitas Sites

This section has described and summarized observations made during the survey and testing of eight prehistoric sites located near or within the canyon of Las Huertas Creek, situated northwest of Placitas, New Mexico. All data for this report are derived from field observations made during survey and testing of the eight sites. Specialists' analyses were available only for site PL 40A; Warren and Warren (this volume) analyzed the ceramics and Bertram (this volume) the faunal materials recovered from that site. Summary data for all other recovered or observed cultural materials are drawn from field observations only. The characteristics of the Placitas tested sites are summarized in Tables 2-19, 2-20, 2-21, and 2-22.

Chronology

Since no radiocarbon dates were obtained from the sites, chronological determinations are relative, based on projectile point types and ceramic types. Some of the sites (Table 2-19) had no indicators of age. The remaining sites demonstrate a great range of time, from possible PaleoIndian through the Archaic to the late Puebloan periods.

Site PL 34A possibly dates to the Archaic period based on the recovery of an Archaic style point. However, as Bertram (1987) has argued, large projectile points may not be such hard and fast markers of PaleoIndian and Archaic occupations as has been generally believed. PL 34A appeared to be a single component site.

Ceramics recovered from PL 40A demonstrate a Pueblo II occupation of the site. Warren gives an age range for the painted wares of A.D. 900 to 1150, and for the corrugated ware a range of A.D. 950 to 1300. It is possible that PL 40A is a multicomponent Pueblo II/ Pueblo III site.

The presence of a possible Eden projectile point and a Bajada projectile point at site PL 5B may indicate PaleoIndian- and Archaic-period use of the site. The two separate occupations could date to 9000 to 8000 B.P. and 4800 to 3200 B.P. respectively. However, the simple presence of the projectile points does not confirm PL 5B as a multicomponent occupation. These early dates should be treated somewhat skeptically.

Lino Gray sherds were recovered from site PL 25B. Lino Gray ware in the Middle Rio Grande Valley is believed to be mainly of Basketmaker III and early Pueblo I (A.D. 450 to 800) age.

Subsistence

Subsistence activity evidence is virtually nonexistent for these Placitas sites. However, corn cob fragments were recovered from PL 25B. Artifactual evidence, i.e., ceramics and groundstone, recovered from PL 40A and PL 25B are indicators of some commitment to horticulture.

Table 2-19. Placitas Site Summary Characteristics.

Site Number	Structures	Elevation	Setting	Scatters	Burned Rock Hearths	Inferred Age
PL 24A	?	1647	Slope	-	-	-
PL 34A	n	1620	Bluff Mesa Edge	-	-	-
PL 35A	?	1620	Mesa Edge	-	-	-
PL 40A	y	1644	Canyon Bottom/ Slope Interface	-	-	PIII
PL 50A	y	1596	Canyon Bottom	-	-	-
PL 51A	?	1614	Ridge	-	-	-
PL 5B	n	1699	Ridge	-	1	PaleoIndian? Archaic?
PL 25B	n	1644	Slope	-	-	BMIII? PIV?

Key: y - yes, n - no, p - probably, ? - uncertain, no data or insufficient testing.

Faunal evidence (Bertram, this volume) was limited to PL 40A and indicated only a small mammal bone fragment, rodent skull fragments and mussel shell fragments.

Technology

With the exceptions of PL 40A and PL 25B, the Placitas sites appeared to be small lithic reduction sites. Locally available Santa Fe formation gravels were the raw materials for the debitage. Cores were observed at all sites except PL 50A and PL 51A. Primary, secondary, and tertiary reduction flakes were represented in the assemblages of most sites. A biface fragment was recorded from PL 35A and projectile points from PL 35A, PL 40A and PL 5B. Groundstone fragments were recovered from PL 40A and PL 25B. Two small manos were recorded PL 40A. Ceramics were discussed above; site PL 4 displayed an unusually high diversity of painted wa of the Pueblo II period.

Rock alignments and features were noted at PL 24A, 34A, PL 35A, PL 40A, PL 50A, PL 51A, and PL 2 Excavators concluded that the L-shaped rock feature PL 34A was a naturally-produced phenomenon and t the circular rock alignment at PL 35A was also possi natural. Evidence for "field houses" was more substa tial at PL 40A and PL 50A. The remaining sites w noted to have collapsed cairns or concentrations of la rocks which may have been shrines.

Table 2-20. Placitas Site Summary — Tools.

Site Number	Mano (#)	Metate (#)	Ground Stone	Ax/ Maul	Chopper	Other Tools
PL 24A	-	-	-	-	-	-
PL 34A	-	-	-	-	-	-
PL 35A	-	-	-	-	-	1
PL 40A	2	-	4	-	-	-
PL 50A	-	-	-	-	-	-
PL 51A	-	-	-	-	-	-
PL 5B	-	-	-	-	-	-
PL 25B	-	-	2	-	1	-

Table 2-21. Placitas Site Summary — Food and Tools.

Site Number	Debitage Density (Relative)	Core (#)	Core Tool (#)	Projectile Points	Bifacial Artifacts	Plant Foods Processed	Animal Foods Processed
PL 24A	3067	-	-	-	-	-	-
PL 34A	10+	2	-	-	-	-	-
PL 35A	18	2	-	-	1	-	-
PL 40A	111+	1	-	1	-	-	L?,S?,R?
PL 50A	5	-	-	-	-	-	-
PL 51A	27+	-	-	-	-	-	-
PL 5B	3+	1	-	-	-	-	-
PL 25B	120+	1	-	-	-	C	-

Key: L - lagomorph; S - shell (marine); R - rodent; C - corn; ? - uncertain if processed.

Table 2-22. Atrisco Site Summary Characteristics; Vessels by Group, Wares, Age (intrusives deleted)

	BMIII-PI				PII-PIII				PIII-PIV				Historic			
	Jars		Bowls		Jars		Bowls		Jars		Bowls		Jars		Bowls	
Site	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec	Ut	Dec
AT 1A	4			3		1		1								
AT 3B	1				8	10	1	10	3							
AT 6B					2	4		1	2			1				
AT 8B	1							1	2		1					
AT 31C	many	8	1	2												
AT 37C	1+?		1	1												
AT 38C	1		?	?	~15	10+	?	4+								

Summary

The evidence reported for the eight Placitas sites represents a very small window on the utilization of Las Huertas Creek. There are hundreds of similar sites in the Placitas area. It would appear that the sites in the area were used largely as short duration occupations for the purposes of lithic procurement and reduction. However, evidence also indicates that horticulture in the bottoms of Las Huertas Creek was an important activity at PL 40A and PL 25B. The possible time span of use at these sites extends from the PaleoIndian through the Pueblo III periods. The most intensive use of the area may have occurred in Pueblo II times. Evidence for multicomponency at most sites is equivocal.

Chapter 3 • Excavation of PL 30A, 32A, and 38A

Jack B. Bertram

Introduction

This chapter details the results of excavations in three sites from the Placitas portion of the Elena Gallegos Project. Site PL 30A is a Pueblo II small structure. Site PL 32A is a Pueblo IV small structure. Site PL 38A is a lithic scatter of uncertain age. Sites were selected for excavation based on their potential, assessed from survey data, to address the research design (Tainter, this volume).

These three sites were excavated in the spring and summer of 1982 by Cibola National Forest archeological crews under the supervision of Dr. Joseph Tainter, Albuquerque-area Principal Investigator. Direct supervision of the excavations at PL 30A was the responsibility of Charles Haecker. Tainter himself directly supervised excavations at PL 32A. When Tainter was absent due to the press of other duties Jeannie Schutt supervised work at PL 32A. Tainter also directly supervised the short excavation session at PL 38A.

The crew for this work included Gail Bailey, James Brandi, Karen Diver, Charles Haecker, Gale McPherson, Jeannie Schutt, Steven Street, Joseph Tainter, Bonnie Tainter, Emmet Tainter, and Helene Warren; Dee F. Green, then Regional Archeologist for the USDA Forest Service, Southwestern Region, joined the crew on PL 30A for one day.

This report was prepared under contract in 1989. I was initially involved in this project only as a faunal analyst, and consequently was not present for the excavation of these sites. To compensate for this real disadvantage, I have revisited the sites discussed here. I also worked with substantial original documentation, which included original excavators' field notes, site supervisors' notes, photographs, logs, maps and record sheets. For PL 30A, a partial site description had been prepared by Haecker; this was used as a major reference but was not incorporated directly into this text in any form.

When this report was prepared, all but one of the specialized analyses were available for my study in manuscript form. Data on radiocarbon and obsidian hydration analyses were provided to me as lab records (radiocarbon) and as summary listings (obsidian). As both of these dating techniques are technically complex and somewhat problematic in the present case, they are discussed in some detail at the end of this section.

The analyses for bone, pollen, and floatation samples were complete, but the ceramic analysis had been carried only to the stage of preparing an incomplete rough draft. The stone tool analysis report, which was to deal completely with all lithic artifacts, was not available when this report was written. I have attempted to compensate for the lack of this important data set by including lithic information from field notes, catalog sheets, and photographs wherever these sources seemed reliable and were sufficiently detailed. Unsigned, undated, internally inconsistent, and clearly unfinished laboratory notes relating to the analysis of lithic collections from PL 30A were also examined and summarized, but no similar data were available for PL 32A or PL 38A.

Dating Procedures and Problems

Dating for the sites described in this report is based on radiocarbon analysis, on obsidian hydration analysis, and on ceramic type dating. All three techniques have demonstrated value; for these Placitas sites, all three also have problems. The specific problems associated with each technique will be discussed.

Radiocarbon

Radiocarbon dating was carried out by the Radiocarbon Laboratory of the University of Texas at Austin, which supplied the Cibola National Forest with basic radiocarbon ages for all datable specimens submitted. Radiocarbon age as determined by the laboratory was based on the Libby half-life for carbon 14 of 5568 years. It is known that carbon 14 actually decays at a slightly different rate, currently estimated to be 5730 $\pm$ 40 years. It is also known that carbon 14 is not present in the atmosphere in an unchanging proportion compared to carbon 12 and carbon 13, the other significant isotopes of the element. At different periods within the last few thousand years, the relative amount of carbon 14 in the atmosphere has fluctuated by several percent. This fluctuation seems to have resulted in a systematic tendency to overestimate age for the crucial period of 100 B.C. to A.D. 1350.

Moreover, not all living things take up and fix the three carbon isotopes in equal proportions; as a result of metabolic pathway isotope fractionation, some species selectively fix a slightly higher or lower proportion of carbon 14 than is present in the atmosphere. As a result, determination of the correct age of a specimen dated by radiocarbon is not a simple matter of measuring radiocarbon concentration and applying a half-life decay formula. Instead, radiocarbon dates must be calibrated to take into account the effects of biological isotope fractionation, true half-life, and secular variation in radiocarbon concentrations in the atmosphere.

As requested, the dates for this project were calibrated to the Klein et al. (1982) radiocarbon data set. This calibration takes account of true half-life and of secular variation for the past seven thousand years. It provides an assessment of the importance of error levels in age estimation. Special consideration is given to the effect of secular trends which result in objects of two different ages having identical radiocarbon ages. Klein et al. concluded that statistical considerations made the effects of short-term secular variation essentially unresolvable for specimens more than 1000 years old, but they provided means to determine the set of possible dates for younger specimens. They produced a set of calibration tables which specify the 95% confidence interval within which a date is likely to lie for a wide range of ages and intrinsic errors. One enters the table with a raw Libby radiocarbon age and exits with confidence limits expressed as years A.D. or B.C. The Klein et al. tables do not specify the means of determining the central point about which these confidence limits are ranged.

It is clumsy to compare radiocarbon dates in terms of two parameters, so archeologists have sought a single-parameter estimate which summarizes the more rigorous confidence limit age specification. It is a common practice to report a calibrated radiocarbon date by specifying its paired 95% confidence limits and the arithmetic mean value of the two limit values. The arithmetic mean is referred to as the midpoint date; this convention has been adopted by most professional journals. The midpoint date is used as a single date estimate of the central tendency date or most likely date associated with a given radiocarbon age.

Klein et al. (1982: Figs. 3, 4) also provide a set of graphs, drawn from the same data base as their tables, which show 95% confidence limits for dates whose original errors of determination were plus or minus 20, 100, 200, and 300 years. The reader should consult the Klein et al. graphs when reading the following paragraphs. Using these graphs, it is possible to determine another estimate of the central tendency date for a sample. This date can be determined by locating the curve which lies halfway between the confidence limit curves for plus 20 years and minus 20 years, and then using this single curve to estimate the "most likely" single age of a sample.

This single curve would represent the true date associated with a given radiocarbon age if no statistical uncertainty at all were present in the determination. Alternatively, it may be thought of as the single limit curve to which both confidence curves would tend as the confidence interval breadth was reduced to zero. I can find this second approach nowhere in the archeological literature, but it is a straightforward statistical technique, analogous to using the mode as an estimator of central tendency for univariate distributions. In this analogy, the customary averaged midpoint metho[d] [o]f reporting central tendency is more comparable to [re]porting the mean in the simple univariate case. I re[fer] to this second estimator as the midline date. Klein [et] al. do not endorse this or any estimator specifically, [but] I believe that my approach is closer to their intent th[an] is the more commonly used midpoint date.

In fact, neither the midline date nor the midpoint d[ate] is rigorously meaningful. Both are convenient a[nd] meaningful ways of presenting the most likely age of [an] object based on the confidence limits. Where obser[ved] distributions are theoretically symmetrical, the me[an] as an estimator would be preferred. Where distrib[u]tions are expected to exhibit considerable skewne[ss], the mode is a more representative estimate for m[ost] cases. Both are presented in this report because t[he] midpoint date alone is not a consistent indicator of t[he] central tendency of the confidence limit curves of Kl[ein] et al., which appear to imply a sheaf of univari[ate] distributions of which the majority are significan[tly] skewed.

In fact, the midpoint and midline dates will not unco[m]monly differ by nearly a century, due to the shifti[ng] skewness properties of different age segments of t[he] actual calibration distributions. Neither is therefo[re] the "true date" we would like; because of the fundame[n]tal stochasticity of radioactive decay, there can be [no] single "true" date. It can probably be shown that [a] simple average of the midpoint and midline dates [is] more precise and unbiased than either alone. Th[is] demonstration is not attempted here; rather, the read[er] is encouraged to evaluate both and trust neither as [he] or she examines this report.

Radiocarbon determinations from other sectors of t[he] Elena Gallegos project often provided dates which we[re] not in accord with ceramic associations or other dati[ng] evidence, with considerable discrepancies between lab[o]ratories studying a split sample, and with a fe[w] discrepancies between sequential studies on a sp[lit] sample run by the same laboratory. These problem[s] have been discussed for the Elena Gallegos Proje[ct] Farmington sector tested sites by Bertram (n.d.) and f[or] the Farmington excavated sites by Raish (n.d.). [It] appeared to both writers that the University of Texas [at] Austin lab produced dates which were systematical[ly] too early. No further insights into that problem we[re] gained in the present study; that laboratory's Placit[as] dates seem also to be a bit too early.

No attempt to correct for the differential uptake [of] carbon 14 by different species has been made in th[is] report. This correction is usually done by determini[ng] the ratio of carbon 13 to carbon 12 in a sample, procedure not requested by the Cibola National Forest when the samples were analyzed. Undoubtedly, such a correction should have been made in some samples. It is known, for example, that saltbush fixes carbon 14 and carbon 12 at a rate different from juniper (Downton 1975; Syvertsen et al. 1976). Some samples reported here appear to have been nearly pure juniper charcoal, others were dominated by saltbush charcoal, a few were definitely mixed, and none was analyzed for species representation prior to submission. To make the corrections based on Toll's partly quantitative macrobotanical analysis (this volume) would be speculative and also beyond my expertise. The reader is simply cautioned to remember that juniper and saltbush specimens of the same age can produce uncorrected carbon dates with differences on the order of 80 years.

Obsidian Hydration

Obsidian hydration dating is based on the demonstration that obsidian incorporates atmospheric or soil water into its surface (that is, hydrates) at a rate proportional to the square root of the time elapsed since the surface was freshly exposed. Hydration is detectable in microscopic examination of a cross-section of a hydrated surface. Hydration rind measurements for this project were carried out by the UCLA Obsidian Hydration Laboratory.

The approach to obsidian dating used in this project depends on the determination of source-specific hydration rates by laboratory experiments in which accelerated hydration is induced by holding obsidian specimens from known sources at high temperatures in the presence of water or water vapor. The resulting hydration rinds are measured and the measurements used to determine the hydration characteristics of the source under study. Hydration rate characteristics for this project were based on experiments carried out by Mohlab (Michels 1984a, 1984b, 1984c, 1984d, 1984e, 1985 and 1987). It is known from induced laboratory hydration experiments that obsidians from different sources hydrate at different rates depending on their chemical composition. It is also known that the hydration process is greatly accelerated by increases in temperature but is substantially reduced by reductions in relative humidity.

A successful obsidian hydration date can be obtained if certain conditions are met. These are: (1) the source of the obsidian material must be known, which usually requires mass spectrometry and statistical comparison of the results with those produced by samples from known obsidian deposits; (2) the specific obsidian hydration rate must be determined, which is usually done by induced hydration experiments performed on a few samples per source; (3) the archeological sample must have been exposed to a consistent temperature and humidity regime, the parameters of which can be estimated. This last requirement is best met by dating only obsidian that was rapidly buried away from thermal variation, in a deposit whose annual variation in temperature and humidity can be estimated accurately or determined by observation.

None of the obsidian which was dated from the Placitas sites meets all of these criteria. Source determination was done by macroscopic inspection alone by several analysts, following the material definitions and code conventions of Warren (1977). In 1982, this procedure seemed adequate; we now know, however, that all of the known Jemez obsidian flows can produce a range of visually indistinguishable stones having very different chemical compositions and hydration rates. We have no assurance that all the important and distinct Jemez obsidian sources have even been located.

None of the Placitas obsidian samples was rapidly and deeply buried well away from humidity and thermal perturbations (e.g., solar soil heating, hot ash dumping, hearth construction, brushfires, droughts, shifts in vegetation cover, etc.). In fact, most of the obsidian studied seems to have come from surface collections, shallow deposits, or excavations near thermal features. Thermal regime was estimated from the Albuquerque weather records.

Based on these facts alone, I would have predicted that the Placitas hydration dates would be unreliable and often much too old. The actual magnitude of the apparent errors, however, was surprising; many specimens appeared to be five or six times as old as they probably were in fact. However, I have chosen to report the hydration data in the interest of research in spite of obvious problems. I believe that accurate hydration dating is feasible, important, and worth further pursuit in spite of its complexity and inadequate current development. To this end, the hydration data will be fully discussed; potential and probable problems and the magnitude of their effects will be further examined in the presentation of individual hydration dates.

Ceramics and Ceramic Dating

Of the several hundred sherds recovered from these sites, only a sample was studied. Moreover, no listing of types by provenience is available. I worked with brief notes and listings of those few sherds which were analyzed for type, treatment, temper, and paste. I also had to rely on rough identifications and quick impressions recorded by excavators in their notes or specimen logs.

For ceramic dates, I have relied on Warren's early publication (Warren 1979c), or on her brief analytical notes (this volume). In the interest of consistency, I have not attempted to use more recent chronologies or typologies. I reasoned that Warren's definition of a well-known type (e.g., Cieneguilla Glaze-on-yellow) probably did not exactly correspond to that type as defined by other workers. Certainly, her rather idiosyncratic naming of types does not readily translate into more usually defined Rio Grande types.

I was unable, without prohibitive reanalysis of the sherds themselves, to determine what now would be appropriate type names for Warren's San Marcial/Early Kiatuthlanna B/w, Late Kiatuthlanna/Red Mesa B/w, Cebolleta/Kiatuthlanna B/w, early Socorro B/w, southern Santa Fe B/w, etc. This problem was not as severe in the Placitas analysis as it was in the study of other areas (cf. especially Warren and Warren [this volume], and Bertram and Burgett [this volume], on Kiatuthlanna as a common type in the Atrisco sector of Elena Gallegos). In the Placitas study, I judged that more coherent results would be obtained by following Warren's treatment exactly, rather than by attempting to translate it into another, more modern typological chronology.

Site PL 30A

Location and Setting

Site PL 30A is located northwest of Placitas at an elevation of 5300 feet (1615 meters). The site is composed of a small Pueblo II structure of two rooms, together with several associated intramural and immediately extramural features; these include hearths, ash dumps, and exterior walls or ramada bases. Also present are three uncertainly-associated extramural features; these include two hearths or ash-filled basins and a cobble concentration (Map 3-1).

The site is located on a low, northeast-sloping ridge of a small erosional terrace. To the west and north, the site overlooks the lower reaches of Las Huertas Creek, as well as its confluence with one of its major tributaries. The Rio Grande flows approximately 1.7 miles (three kilometers) to the west-northwest; its floodplain is visible from the site. The site is set on coarse alluvial soils dominated by limestone, sandstone and quartzite cobbles and pebbles in a sandy matrix; it does not appear to be undergoing significant erosion.

Vegetation on the ridges in the vicinity of the site consists of sparse junipers over an understory of grama grasses, snakeweed, narrowleaf yucca, rabbitbrush, Mormon tea, chollas, and prickly pear. A medium-siz juniper tree grows from the western portion of the roc block mound. Important plants present on the san alluvial bottoms just below the site to the north and w include ricegrass, Apache plume, saltbush, narrowl yucca, gramas, prickly pear, and thistles.

Testing and Excavation Methods

PL 30A was recognized as potentially containing Puebloan structure substantially older than othe known from the Placitas area (Tainter, this volum Consequently, it was not included in a prelimina testing program, but rather was selected immediat for full data recovery on the strength of survey.

Survey data indicated a sparse ceramic and lithic scatt extending over an area of approximately 40 by 30 mete along a ridge. Noted within the scatter were a two-ha mano, two obsidian projectile points, debitage, a sherds of probable Pueblo II (about A.D. 900 to 110 age. Roughly centered within the scatter area was cobble mound, suspected to contain a structure, e tending over an area of about 6 by 12 meters a oriented, as was the surface artifact scatter, rough northwest-southeast (Figs. 3-1A and B). An oval cobb ring (Fig. 3-2), thought to be a hearth, was the or exterior feature noted on survey; this feature, rough 0.9 by 0.6 meters in diameter, lay about four mete northwest of the probable structure.

Due to the great potential importance of the probab structure, the effort budgeted for this site was allocat primarily toward excavation of the structural mour and its immediate area. This area was defined as sampling stratum in which excavation sampling inte sity was expected to be 100 percent. It was decided sample the area outside the structural mound and i environs at a much lower initial intensity, on the ord of 6.25 percent, using an aligned, semi-random proc dure to be detailed below. Features encountered sample excavations within the outer stratum were th to be excavated more extensively as required to perm their full assessment.

To achieve this sampling level, the site was gridded in blocks four by four meters in size. Areas that lay w away from the mound, that lay on slopes, or that had r associated artifacts were excluded. Grids were deve oped, using a transit and tape, from a working datu located ten meters east and ten meters south of th apparent mound center. This point was designat 100N/100E. Block corners were laid out along th cardinal directions (i.e., oriented to true north) eve four meters from this point until an irregular, rectang lar-polygonal area was delineated. This area, whic

Figure 3-1a. Feature 1 in Site PL 30A at the start of the excavation; view is northwest.

Figure 3-1b. Rooms 1 and 2 cleared from the area of Feature 1; view is southeast.

to the southwest corner of the unit in question, using standard tape and line level measurement methods. All provenience data were thus directly recorded as three-dimensional coordinate positions relative to the site datum's arbitrary value of 100 meters north, 100 meters east, and 100 meters elevation.

To simplify in-field reference to excavation units and their contents, each excavated unit was also given an excavation unit record identification number, according to the sequence in which units were excavated. These numbers were recorded in a field excavation unit log for ready reference. Unit number 1 was reserved for surface items which were point-plotted and collected. Unit number 21 was apparently never assigned. All other unit numbers through 99 were assigned, and the corresponding units fully or partly excavated. Thus, 97 units were opened on this site (Map 3-2).

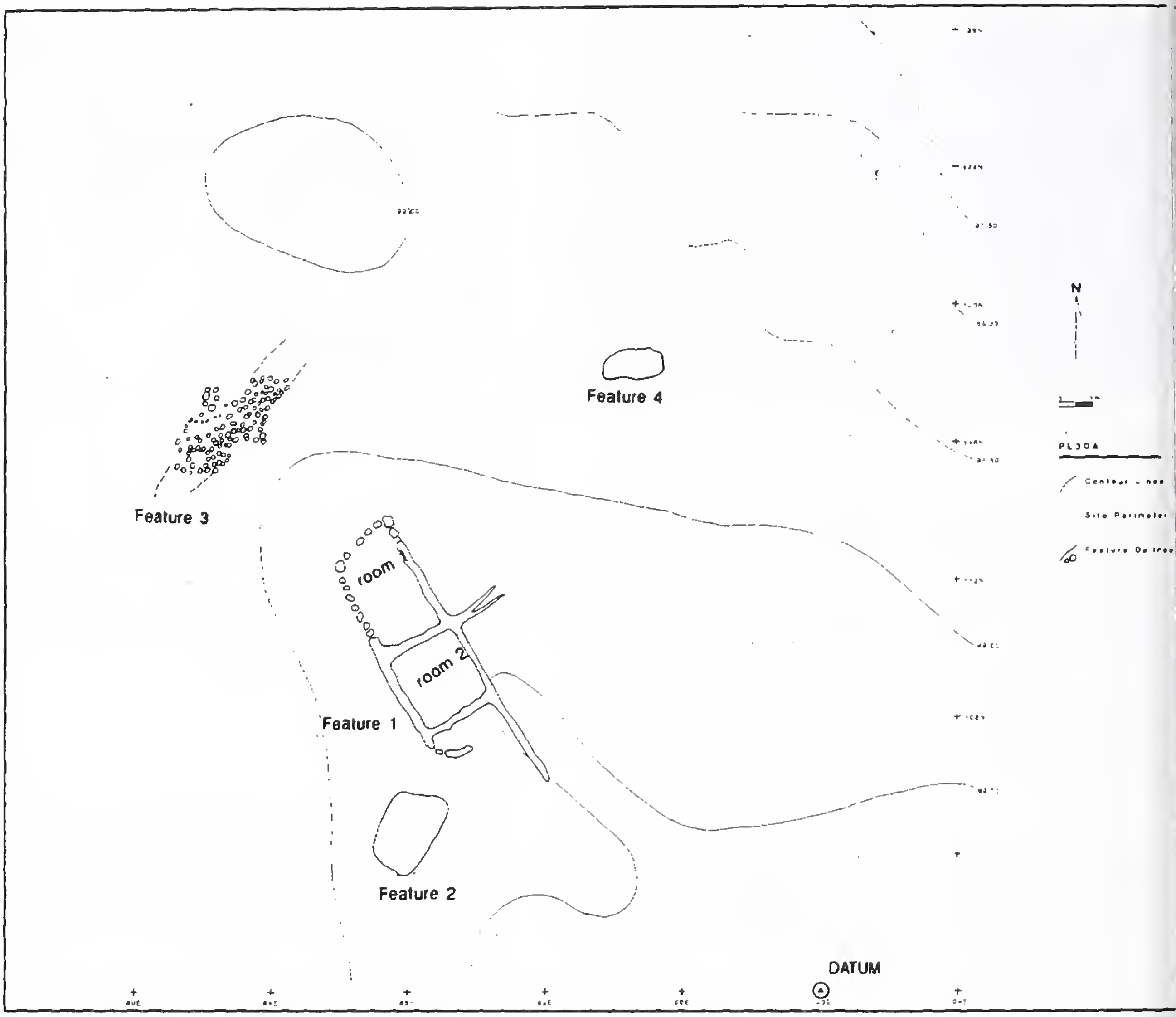
Excavations across the site were carried out using shovels, trowels and (occasionally) mattocks, in natural stratigraphic level units subdivided as necessary into 10 centimeters-thick arbitrary levels. Where arbitrary levels were dug, their closing contours were chosen to conform in strike and dip to the surface terrain or to the most recently encountered stratigraphic contact.

Stratum/level forms were completed for all levels or strata dug; these specified the location, contents, and opening and closing depths of the level or stratum described. All fill was screened; all artifacts and paleobiological specimens encountered were collected. Artifacts and specimens were promptly logged into a field specimen book; field specimen numbers were assigned sequentially by log order. When features were defined in the course of excavation, feature forms were completed; these served as in-field summaries of the units containing a feature and of the nature and extent of the feature. Stratigraphic and feature plans and profiles were recorded as appropriate. Ongoing work and exposed details of soil and architecture were routinely photographed in monochrome and in color. Samples of soil were collected for floatation and pollen analysis as indicated.

Site Elements

The site was found to contain a single structure (Feature 1) having two definite rooms and several partly enclosed extramural spaces. Within the structure, a total of six intramural basins, hearths, or adobe concentrations (Features 6, 7, 10, 11, 12 and 13) were defined. Outside the structure but attached to it, or otherwise closely associated, were found seven features, including two

Figure 3-2. Feature 3, a cobble ring, in Site PL 30A.

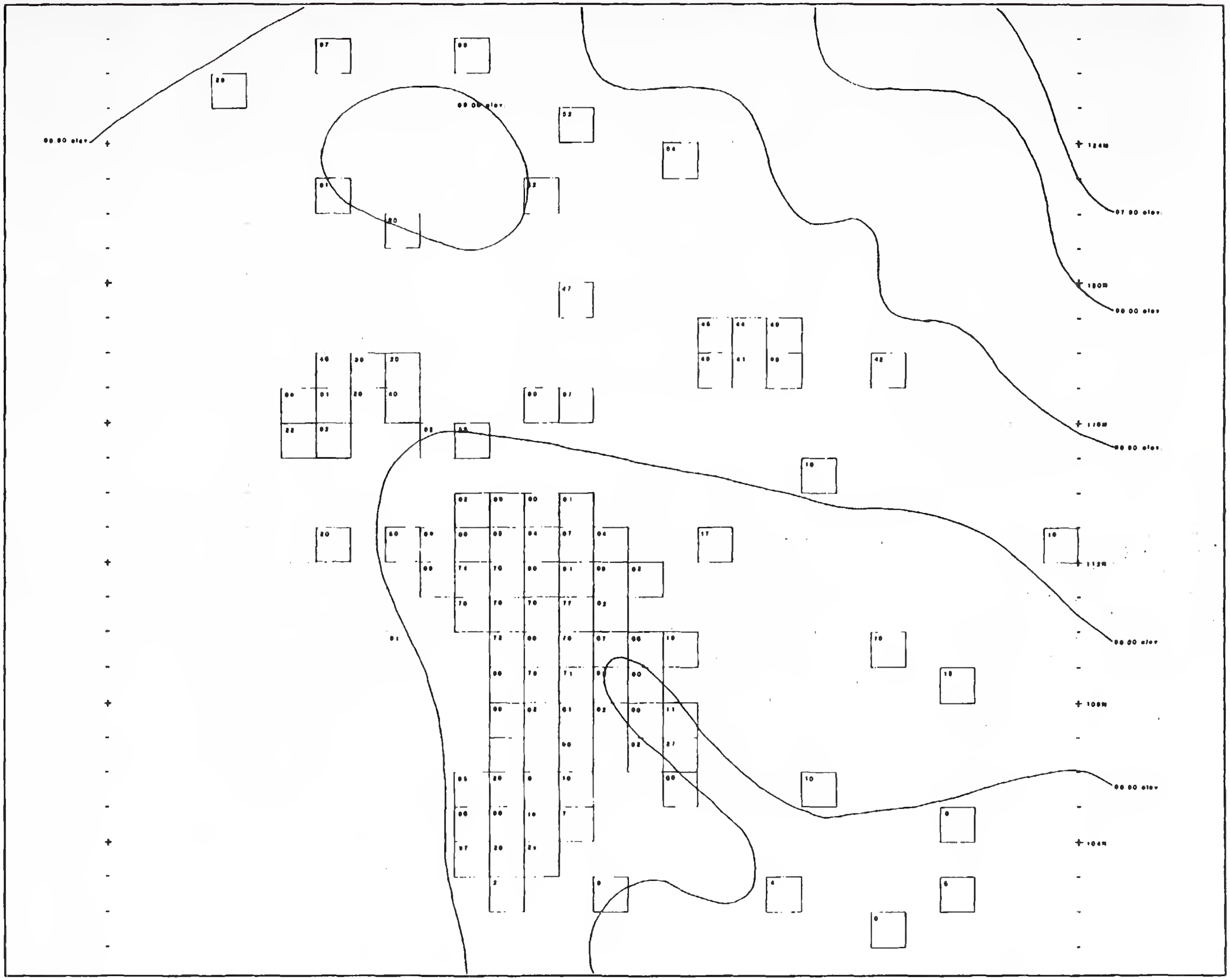


Map 3-1. Main surface features of Site PL 30A.

defined the site for purposes of sampling was bounded by the points 128N/76E, 128N/92E, 124N/92E, 124N/96E, 120N/96E, 120N/100E, 116N/100E, 116N/104E, 100N/104E, 100N/84E, 112N/84E, 112N/80E, 124N/80E, and 124N/76E, where all coordinates denote distance from datum in meters. In all, 544 square meters were thus included in the sampling universe of 34 blocks, each block being square and 16 square meters in area.

Sample units for excavation were selected by consulting a random numbers table. Random numbers were drawn until one and only one unit (of size one by one meter) had been selected from each of the four by four meters grid blocks within the site boundary as defined Units were identified by reference to their sou corners. Those units selected from the area outs rubble mound stratum constituted the explo sample of the non-structural area of this site selection within the mound stratum was irrelev most or all mound stratum units were to be exca

Elevations were recorded for each of the block co using a transit and stadia rod. Elevations southwest (i.e., datum) corners of units selec excavation were taken from the nearest block co elevation, using a line level. Elevations and loc within excavated units were then determined r



Map 3-2. Excavation units in Site PL 30A.

and perhaps three wing wall or ramada bases, two ash lenses, a hearth, an area paved with adobe, and an adobe concentration (Features 5, 8, 9, 14, 15, 16 and 17). Away from the structure and perhaps associated with it were found two ash dumps, ash-filled basins, or hearths (Features 2 and 4), and also a cobble concentration (Feature 3).

In order to set the stage more clearly for description of the structure and its associated intramural and extramural features, the stratigraphy and character of those portions of the site located at a distance from the structure will be described first. Then the structural associations will be characterized.

The General Site Area (Non-structural)

A total of 22 single one square meter units were partly or completely excavated in the site areas away from the Feature 1 mound complex. In addition, a block of 12 contiguous units was ultimately excavated to explore Feature 2, an ash stain discovered in the initial sample excavation of Unit 9. Feature 3, first recognized on survey, was explored by opening a contiguous block of nine units and two nearby blocks of two units each. Feature 4, an ash stain first encountered in Sample Unit 41, was explored by contiguous excavation of six units. Thus in total, 53 square meters of a possible 500 square meters were excavated in whole or in part in the outlying areas of the site, for a total areal sample of the nonstructural sampling stratum approaching 10.6 per cent.

Non-featural Areas

Non-featural areas of the site had a rather uniform stratigraphy. The surface stratum was a fine-grained sandy loam, with a loose texture, and with fairly abundant pebble inclusions. It was usually no more than about 20 centimeters in thickness. It typically contained finely divided ash, occasional charcoal flecks, and a relatively low density of sherds and lithic artifacts. In general, the abundance of both lithic items and of ceramics declined markedly with distance from Feature 1, suggesting that no formal midden disposal area was ever set aside and routinely used by the site's occupants.

Artifacts collected from the surface, or from the surface stratum outside featural associations, included a mano, two biface fragments and at least one projectile point. Subsurface artifacts found in this stratum were dominated by obsidian and chalcedony flakes and angular debris, with chert, quartzite and basalt debitage also occurring. A few formal chipped stone tools were recovered; these were apparently all of obsidian. Several cores and tested cobbles were noted; some cores have been recycled as choppers and/or hammerstc

Ceramic artifacts from the surface stratum inclu plain and corrugated utility sherds, and black-on-w decorated sherds. Warren and Warren (this volu provides full provenience only for those sherds anal in detail; of these, her data indicate that sherds Kiatuthlanna B/w bowl and of a Red Mesa/Kiatuthla bowl were found on the far northeast side of the sit few meters north of Feature 1, and in possible asso tion with Feature 3, were found sherds from a Kwa B/w bowl and from a Gallup (Prewitt) B/w bowl. A these types would date roughly to the Pueblo II per

The second stratum encountered in units located a from featural areas was a silty clay, hard-packed carbonate-enriched, with pebbles and caliche ped the major inclusions. Artifacts were rare in this stra and seem to have been encountered only near its up surface, suggesting that this stratum represents the upon which occupation of the site occurred. Wh features were encountered on the extramural exca tions, they lay on this lower stratum or were intru into it. In a few locations, the lower stratum was abs and the upper cultural stratum lay directly on bedro Judging from field notes, little difference other tha reduction in abundance was noted between the ass blage from this occupation surface stratum and assemblage from the richer, overlying stratum. upper stratum seems to represent a dispersed, thin, a artifact-poor sheet midden deposit.

Feature 2

Feature 2 was discovered in excavation of non-stru tural Sample Unit 9 (105N/88E), appearing as a distinc darker and more charcoal-enriched lens directly und lying the upper cultural stratum just described. T feature was explored by the excavation of units betwe the points 106N/86.5E, 106N/90E, 103N/89E, a 103N/86.5E (all or portions of units 7, 9, 14, 16, 24, 26, 28, 35, 36, and 37). It proved to be an ash-fil shallow depression or large surface hearth, lying rectly on the lower, use-surface stratum describ above, and intruding as much as 24 centimeters ir that stratum (Figs. 3-3 and 3-4).

The feature was at maximum 2.2 by 1.8 meters in s and was roughly oval in outline, centering on the poi 104.5N/88E. The western half of the feature w exposed but not excavated, while the eastern half w fully excavated and profiled. The feature was found be a flat, shallow basin of about 20 centimeters dept with a somewhat deeper area near its northern edg There was no distinct evidence of burning, and

Figure 3-3. Site PL 30A, Feature 2, a stain.

stratigraphic evidence suggesting remodeling or episodes of repeated use.

Pollen, floatation, and radiocarbon samples were collected from the feature fill, which proved to be composed of pockets of relatively pure charcoal intergraded with adobe lenses in a mixed ashy-sand matrix. Obsidian hydration samples were submitted from proveniences associated with the feature fill. Sample results will now be discussed.

Four floatation samples were analyzed by Toll (this volume), who found no definite Puebloan non-fuel species in the rather badly contaminated mix of modern intrusive plants recovered. She identified charcoal from pinyon, juniper, and saltbush, noting that juniper occurred alone, with saltbush, and with pinyon in different samples. She suggested that multiple dumping episodes were indicated by the heterogeneity of charcoal samples from different areas of fill within the feature.

Eight obsidian hydration samples were submitted from contexts above or within the fill of Feature 2. Two samples were undatable, and six produced dates inconsistent with the Pueblo II ceramics associated with the feature (Table 3-2). As I have argued elsewhere (Bertram and Burgett, this volume), hydration dates from obsidian associated with thermal features or ash dumps cannot be expected to be reliable.

Furthermore, source determinations for the obsidian samples in question were made by visual inspection, not by the more accurate chemical methods now widely practiced. We have learned in the last few years that visual sourcing is unacceptable for most or all of the Jemez group of obsidian sources. All of the Jemez types have been shown (Bertram et al. 1987; Lord, Cella and Bertram 1987) to vary widely in source-magma body chemistry, and hence in hydration rate, within a single visually-defined material class.

However, sourcing error alone cannot account for the earliness of the dates produced in this case: a range of about 3910 to 569 B.C. Even the fastest-hydrating local source (3510, Grant's Ridge) would produce a date range of about 1010 B.C. to A.D. 868 for the hydration rind thicknesses measured for these samples. It seems likely that the obsidian samples from Feature 2 were indeed Jemez types, but were "over-hydrated" by short-term exposure to fire or hot ash, or by long-term exposure to hot shallow soil. The inferred dates from those samples should therefore be rejected as meaningful dates for the feature.

Neither pollen nor radiocarbon samples from Feature 2 were submitted for analysis.

Artifacts associated with the feature included both utility and decorated sherds, some of which appeared to have been burned after breaking, based on the excavators' field impressions. All ceramics were referrable to the Pueblo II period (Warren and Warren, this volume). Also present were chipped stone items; 41 chalcedonic chert and 29 obsidian flakes, a basalt flake, and a chert core were found in or immediately associated with the feature.

An obsidian concentration was noted in the feature plan drawing of Unit 28, lying on the southern edge of the feature; roughly 14 obsidian primary and secondary flakes were recorded as having been collected from that unit. Two of the obsidian flakes were found to fit together.

In summary, Feature 2 was a broad, shallow basin dug into the site's living surface and later filled with ash, charcoal of at least three types, adobe, and sediment. The feature may have been produced initially as an adobe-mixing pit or borrow pit, and used later as a convenient dump site. Direct burning within the feature seems unlikely as an initial use, since no evidence of substrate burning was found. However, later use as a hearth cannot be ruled out; a fire built on dumped ash might leave little or no evidence other than ash and charcoal. On the basis of ceramic content, the feature was probably associated with the occupation of the Feature 1 structure.

Feature 3

Feature 3 was discovered on the original survey of PL 30A, appearing as a ring of about 14 limestone cobbles arranged in a roughly circular outline, centered on the point 115.8N/81.9E, and measuring approximately one meter in diameter (Fig. 3-2). It was not immediately excavated, since it was intersected by a sample unit and was expected to contain a prepared hearth or other

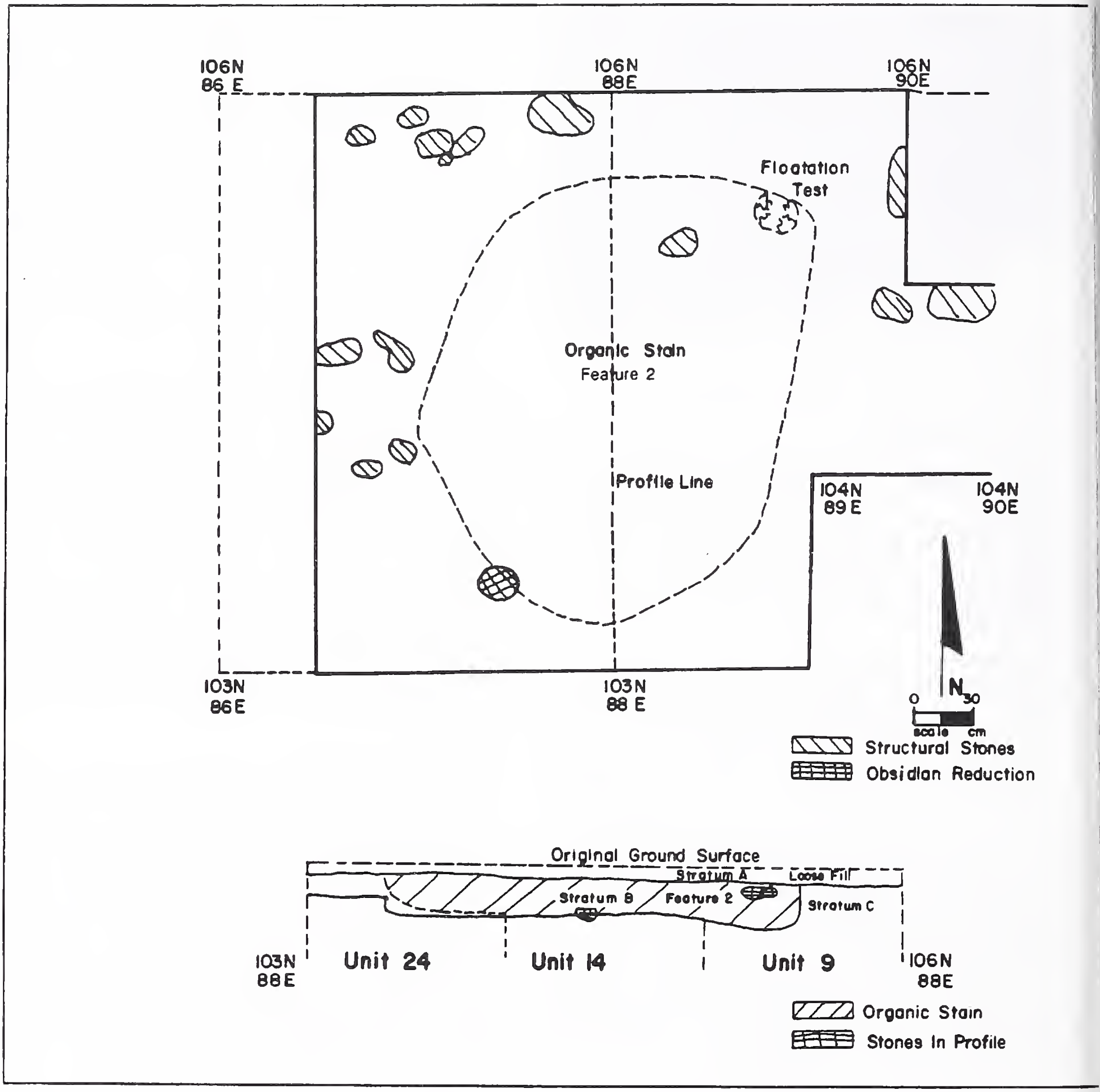


Figure 3-4. Plan and west profile of Feature 2, Site PL 30A.

structure. Other units in the general area were scheduled for earlier excavation.

Ongoing excavations in Units 22 and 23 (115-116N/85-87E), Units 27 and 29 (116-117N/88-90E), and Unit 30 (117N/84E) indicated that the north-central area of the site was underlain by soils having many large cobbles, some of which appeared to have been laid in alignments. At that point, a decision was made to open a contiguous block of units to evaluate the cobble concentrations and their relationship to the suspected feature or features suggested by the surface and subsurface alignments. Eventually, all or portions of eight more units (31, 32, 33, 34, 38, 39, 40 and 46) were opened.

The results of these excavations indicated that a feature of an unanticipated sort was probably present. The entire area just north and west of the structural mound proved to be underlain by cobble deposits. Cobbles were found commonly in the upper "sheet midden" stratum described above; portions of the lower "use-surface" stratum were found to be composed mainly of cobbles, with relatively little finer soil and no evidence of adobe mortar or plaster. The ring of cobbles observed on the surface proved to lie atop and adjacent to a cobble concentration which appeared to extend across all the units excavated in the area. The apparent ring alignment was judged to be accidental or at least not definitely structural. It was originally thought to be a feature because only those rocks which formed the ring happened to be visible from the surface (Fig. 3-1).

No obviously associated charcoal or artifacts were found; no clear evidence of burning was noted. The ash and charcoal flecks generally present in the upper stratum and on the contact between strata elsewhere in the non-featural site area were present here as well, but not in unusual abundance. Similarly, the artifacts encountered were not different in kind from those found elsewhere in the non-featural area, although far fewer artifacts were found per unit in the Feature 3 area than were encountered elsewhere. This would suggest that the cobble concentration area tended to be avoided by inhabitants' trash dumping. No radiocarbon, floatation, or pollen samples were submitted from Feature 3.

The cobble concentration seems to have been artificially produced, judging from patterns of cobble distribution. The southeast portions of Units 30, 32, and 40 were found to have been cleared of cobbles; the northwest corners of units 34 and 46 were likewise apparently cleared. The eastern half of Unit 27 seems also to have been cleared. Cobbles were especially concentrated in Units 31, 33, 38 and 39.

These observations suggested that the area north and northwest of the structure may have been cleared of cobbles, with rocks being stacked in a northeast to southwest alignment passing through the point 117N/83E. Other cleared areas lying nearer the structural mound may have been present but obscured by colluvial accretion of wall fall from the decomposing structure. No changes in sediments (coarse sand matrix, microbedding of matrix, etc.) were seen which would suggest that the cobble concentrations were alluvial rather than cultural in origin.

In summary, Feature 3 appears to been a low stack or pavement of cobbles, flanked by areas cleared of cobbles, and lying across the low ridge which runs northwest from the Feature 1 structure. Excavations in the feature were terminated before the northeast and southwest ends of the concentration were fully defined; the concentration may have been linear and may have extended northeast and southwest for some distance. The stack may represent clearing of the use area around the Feature 1 structure, or stockpiling of materials for construction, or a rather informal but deliberately constructed dry-laid terrace or retaining wall. No evidence suggesting thermal, residential, processing, storage, or other functional use was found in excavations in Feature 3.

Feature 4

Feature 4 was discovered in excavation of non-structural sample Unit 41 (117N/94E), appearing as a gray ash-stained soil about ten centimeters below the surface of the comparatively less ashy upper "sheet midden" stratum previously described. It was explored by excavation of all or part of six units (Units 41, 43, 44, 45, 48 and 49). It was found to consist of an ash-filled shallow pit with randomly scattered rock inclusions, lying on and intruding as much as 20 centimeters into the underlying "use-surface" stratum which extends across the site (Fig. 3-5).

The feature was at maximum 1.55 by 1.45 meters in size and was roughly oval to circular in outline, centering on the point 118.4N/94.5E, and lying a few meters northeast of the Feature 1 structure. The feature was excavated by stripping all six units down to the stain's upper surface, then opening portions of Units 44, 45, and 48 down to the base of the stain and beyond into sterile substrate. The feature was found to be a flat, shallow basin of about 15 centimeters depth, filled with ashy, gray sand, sporadic charcoal lumps, and fractured rock clasts. No evidence of multiple use episodes or of multiple dumping lenses was noted. No pattern was discerned in the alignment or disposition of the stone inclusions within the feature, some of which were thought by the excavators to have been burned.

Charcoal samples were taken from the feature fill; obsidian hydration samples were selected from the associated artifacts found above or adjacent to the feature. The sample results will now be discussed.

Two radiocarbon samples were submitted from the samples collected in Feature 4, but only one sample was large enough to process (Table 3-1). It indicated a best estimate (i.e., at an assumed standard error of zero) date of A.D. 860 and a midpoint estimate (i.e., the arithmetic mean of the 95% limits) date of A.D. 820, with 95% confidence limits of A.D. 615 and A.D. 1025, using the consensus calibration of Klein et al. (1982: 118). Neither of the estimated dates are unreasonably early for a feature thought to be associated with a Pueblo II room

Table 3-1. Site PL 30A Radiocarbon Dates.

University of Texas No.	Material	Forest Service No.	Unit No.	Level or Feature	Libby Radiocarbon age - years BP	Error (years)	Dates In Years AD: 95% Older limit	Mid-point date[1]	Mid-line age[2]	95% Younger limit
4770	hearth fill	276	64/83	Fea. 14	1350	230	335	680	630	1,025
4765	hearth dump	110	68	Fea. 5	1310	210	400	720	635	1,040
4766	post?	99	56	in Fea.15	1240	380	365	795	775	1,225
4767	hearth/ dump	94	48	Fea. 4	1200	100	615	820	860	1,025
4769	roof fall	222	80	Fea. 7	1150	180	585	910	890	1,235

Notes: [1] Arithmetic means of older and younger limits.
[2] Theoretical value at zero uncertainty level (see text).

Table 3-2. Site PL 30A Obsidian Hydration Data.

FS No.	Unit No.	Level	Material [1]	Microns of Rind[2]	Age BP (3500)[3]	Age BP (3520/25)[4]	Age BP (3523)[5]	Age BP (3510)[6]
42	20	0-10	3500	4.1	2495	1604	2383	816
44	26	above F.2	3523	4.8	3421	2199	3267	1118
41	20	0-10	3520	4.6	3110	1999	2971	1017
43	25	above F.2	3525	5.2	3974	2554	3795	1300
6	10	0-10	3500	6.7	6622	4258	6327	2165
9	7	0-6	3520	5.8	4943	3177	4721	1616
35	19	strat A	3500	6.4	6078	3908	5807	1988
46	27	strat A	3520	6.3	5833	3749	5571	1907
62	41	strat A	3520	4.7	3247	2087	3101	1062
51	28	above F.2	3520	7.2	7693	4896	7275	2491
68	43	strat A	3520	7.3	7832	5033	7479	2561
69	44	strat A	3520	7.5	8267	5313	7895	2704
82	9	F.2	3520	6.6	6401	4114	6113	2093
104	66	?	3520	6.8	6862	4367	6489	2244
162	61	strat B	3500	7.9	9261	5955	8849	3028
196	95	strat A	3500	7.9	9261	5995	8849	3028
227	72	strat B outs.	3500	4.6	3140	2019	3000	1027
240	73	near wall	3500	6.2	5405	3475	5154	1767
249	62	lower floor?	3500	7.0	7272	4676	6948	2378
267	56	strat B	3500	7.2	7618	4896	7275	2491
73	45	strat A	3500	6.8	6862	4367	6556	2244
263	87	upper floor	3520	6.3	5833	3749	5571	1908
51	28	above F.2	3520	7.9	9261	5955	8849	3028

Notes: [1] As visually sourced following Warren. [2] As measured by UCLA Obsidian Hydration Laboratory.
[3] Assumed material type 3500 (Cerro del Medio?). [4] Assumed material is type 3520/25 (Obsidian Ridge).
[5] Assumed material is type 3523 (unknown). [6] Assumed material is type 3510 (Grants) (unlikely).

block, if we assume that old wood was burned on the site. If the site actually dated to about A.D. 950, then the date is about 110 years too old.

Four obsidian samples were processed, yielding dates for three visually identified type 3520 pieces of 3328 B.C., 3048 B.C., and 102 B.C., and a date for visually identified type 3500 of 4877 B.C. If the 3500 sample was actually of type 3520 (a distinct possibility), then it would be properly dated to the range 2427 to 2132 B.C. (Table 3-2). As was suggested above in the discussion of Feature 2 obsidian dates, these dates are also suspect

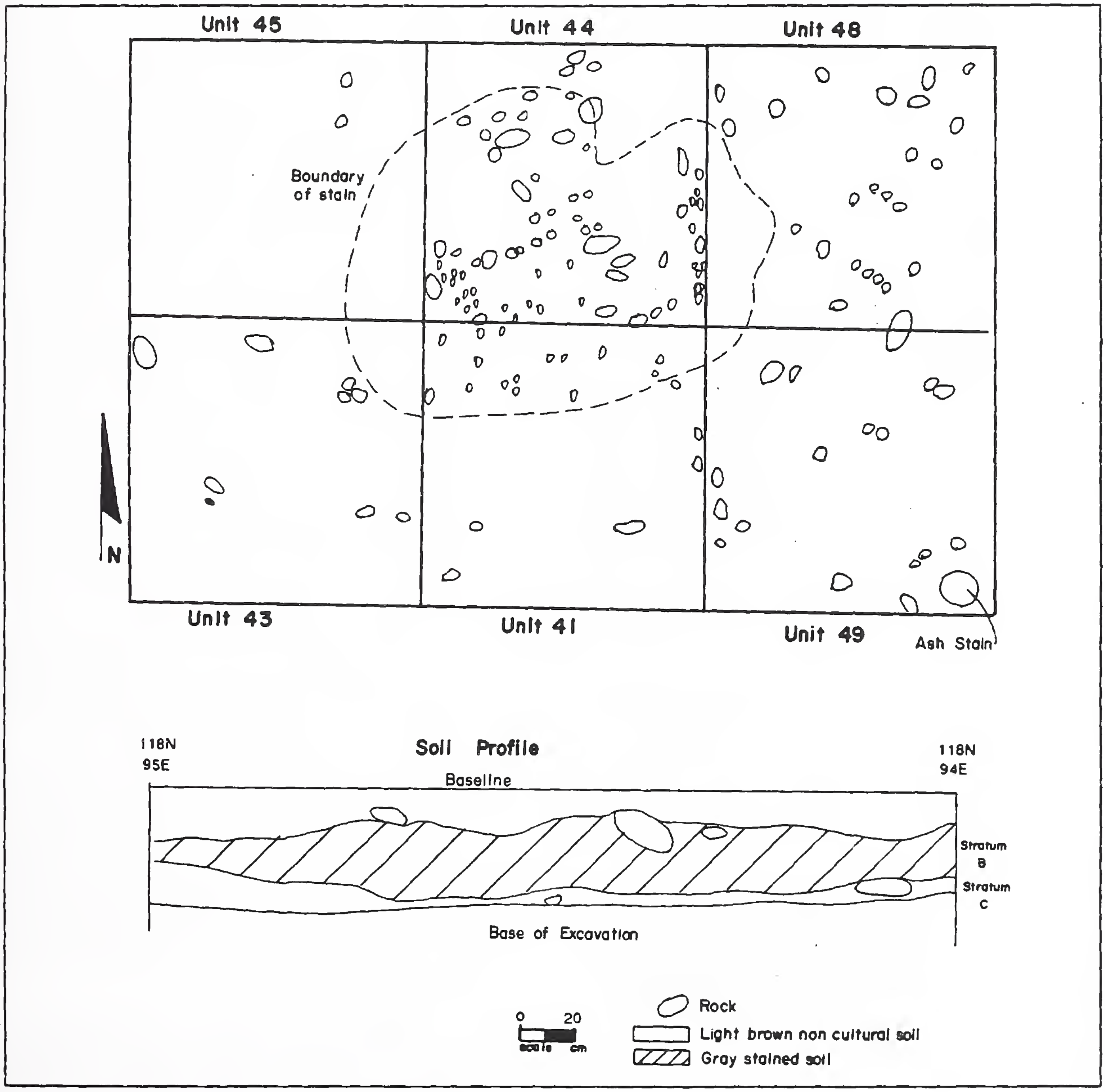


Figure 3-5. Feature 4 in Site PL 30A; plan and south wall profile of Unit 44.

because they are associated with a possible thermal feature or hot ash dump, and because they were not deeply and rapidly buried after deposition. They are undoubtedly too old, perhaps by a factor of as much as five times.

The date of 102 B.C. was derived from a typologically distinct arrow point, having side/corner notching and a convex base (Fig. 3-6). This point style is generally considered to date much later (about A.D. 500 to 1200 [Thoms 1977]).

Although pollen and floatation samples were collected from Feature 4, none was submitted for analysis.

The overlying sheet midden stratum contained charcoal, ceramics, and lithics, but it appears than few or no artifacts were found within the ashy feature fill. Artifacts recovered from the general association may include a sample from a projectile point manufacturing assemblage. Three obsidian point preforms and an obsidian point were reported to have been collected from the feature overburden, feature surface, or strata contact adjacent to the feature. Possibly also associated were grayware (and perhaps other) sherds, 11 items of obsidian debitage, a core and 27 debitage pieces of chalcedonic chert, and a chopper and one flake of basalt.

In summary, Feature 4 appears to resemble Feature 2 in that its substrate exhibited no burning, its fill was mixed ash, sand, and charcoal, and it was associated with lithic concentrations suggesting the presence of a lithic work area. Feature 4 was unlike Feature 2 in that its fill contained little adobe, substantial quantities of (possibly burned) limestone clasts, and no internal heterogeneity interpretable as evidence of multiple "basket load" dumping episodes. Feature 4 also was apparently associated with substantially more lithic tool manufacturing rejects, losses, or failures than was Feature 2. Like Feature 2, it seems to have begun as a shallow basin borrow pit or adobe pit, then to have been used as a dumping locus, and later perhaps also to have functioned as a hearth.

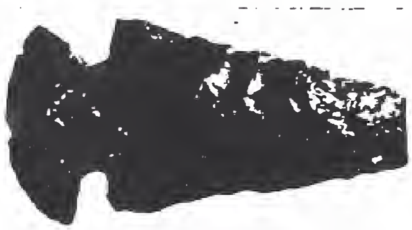


Figure 3-6. A side-notched projectile point from Feature 4, Site PL 30A. Base width is 1.1 centimeter.

Feature 1 Room Block and Associated Features

The rubble mound which was excavated as Feat[ure] was initially recognized as a probable small structu[re] survey. Excavation of the mound was only begun [a]fter the extramural areas well away from the mound [were] fully evaluated, as detailed above.

Excavation Sequence and Approach

The mound was completely explored by the excav[ation] of all or portions of 44 contiguous units. Excava[tion] proceeded first to uncover the areas thought t[o be] crossed by wall alignments. Once these were fairly [well] established, effort was directed toward the study o[f the] southern half of the mound, which appeared to con[tain] the only well-defined and completely enclosed room. [As] excavation of that room neared completion, effort [was] directed toward the exploration of the less-well-def[ined] northern room and of the partly enclosed extram[ural] work areas abutting the structure to the east and so[uth].

In the course of excavation, care was taken to ma[p] possible structural elements as they were encounte[red]. As elements were shown to be in situ structural com[ponents], this observation was noted on the excava[tion] maps. In general, excavation within wall mass ce[ased] when walls were fully defined. Only one stratigra[phic] cross-section through a main wall was cut and prof[iled]; consequently, little information on wall footing detai[l or] on interior-exterior surface relationships is availa[ble]. However, good data were recovered on wall construc[tion] above the footing level for most walls.

When floors or probable features were encounte[red], excavation was directed toward detailing contact a[sso]ciations for recovery of artifacts and samples. [Two] superimposed floors were encountered within the st[ruc]ture, and superimposed extramural surfaces were [also] discovered. It appears that the lower floor was only [cut] through for subfloor testing in one or two units; th[is] indicated that no cultural materials were present be[low] the lower floor. Only poorly-preserved features were [cut] out for stratigraphic examination of construction det[ail] and floor-feature association; excavation generally cea[sed] when the feature surface itself was fully defined. A[s a] result, little information on feature substrate inclusi[ons] (ramada and structural posts, artifacts, filled subf[loor] features, etc.) or hidden remodeling episodes (if any) [is] reported.

Construction Sequence and Character

In describing the structure and its associated featu[res], it is difficult to avoid reference to data not yet present[ed]

In this case, clarity of presentation may be enhanced by first presenting the inferred construction sequence and by subsequently discussing individual strata, rooms, features, and the data they provide in support of those inferences. The implied construction sequence for the structure and its associated features is rather complex, and many features are not clearly assignable to a particular point in that sequence. The description presented here is unavoidably somewhat conjectural (Map 3-3).

It appears that the area was first roughly leveled. The leveled construction surface lay at or near the top of the exterior area's "use-surface" stratum, described previously. The lower adobe interior floor surface may have been laid directly on the construction surface at this time. The adobe floor surface may or may not have been continuous with the lowest exterior adobe surfaces discovered to the east and south of the structure.

Evidence from wall ties seems to indicate that the southern room (Room 2) was constructed first. The southeastern and eastern wing/ramada walls (Features 17 and 16) may have been partly constructed along with the Room 2 walls, as perhaps was the basin (Feature 12) along the north wall of Room 2.

Somewhat later, Room 1 appears to have been added onto Room 2, with its walls being poorly tied to the Room 2 corners. The Room 1 west wall seems to have been founded directly on the first floor surface, which may have existed for some time previously as an adobe-paved exterior use-surface. It is possible that the Room 1 east wall was built wholly or in part before the rest of the room was enclosed; it may have stood for a time as a northern analog to the southeast wing wall or ramada wall base (Feature 17). The northern end of the Room 1 east wall and the southern half of the Feature 17 wall appear to differ in construction from the portions of those walls lying nearer to the Room 2 corners.

Still later, relatively clean, massive adobe chunks and sandy clay soil were used to fill and raise the level of the floor. A new and higher puddled adobe floor was then installed in both rooms. Possibly Feature 12, and almost certainly all the other intramural structural features (Features 10, 11, and 13), were built on or into this later floor. Features 11 and 13 seem to have been superimposed on the filled-in Feature 10, which may have been an adobe puddling pit used in the reconstruction of the room block and then immediately back-filled.

Features 5, 14, and 15 are exterior features associated with the east wing wall; Feature 14 (a collared hearth) may post-date Features 5 and 15 (possibly portions of a single ashy midden lens). Feature 8, a southern exterior paved area partly enclosed by low, dry-laid walls, may have been remodeled along with the structure to which it was attached.

Features 6, 7, and 9 may not be functional features at all, but rather may represent episodes in the collapse of the abandoned structure. Features 6 and 7, encountered on the upper floor, seem to be damaged areas related to roof collapse; Feature 9 may represent a concentration of adobe wall-melt from the seemingly insubstantial north wall of Room 1.

Descriptions of individual features will now be presented. The structure and its contents will first be described in rough order of construction, then exterior features will be discussed. Finally, evidence from arti

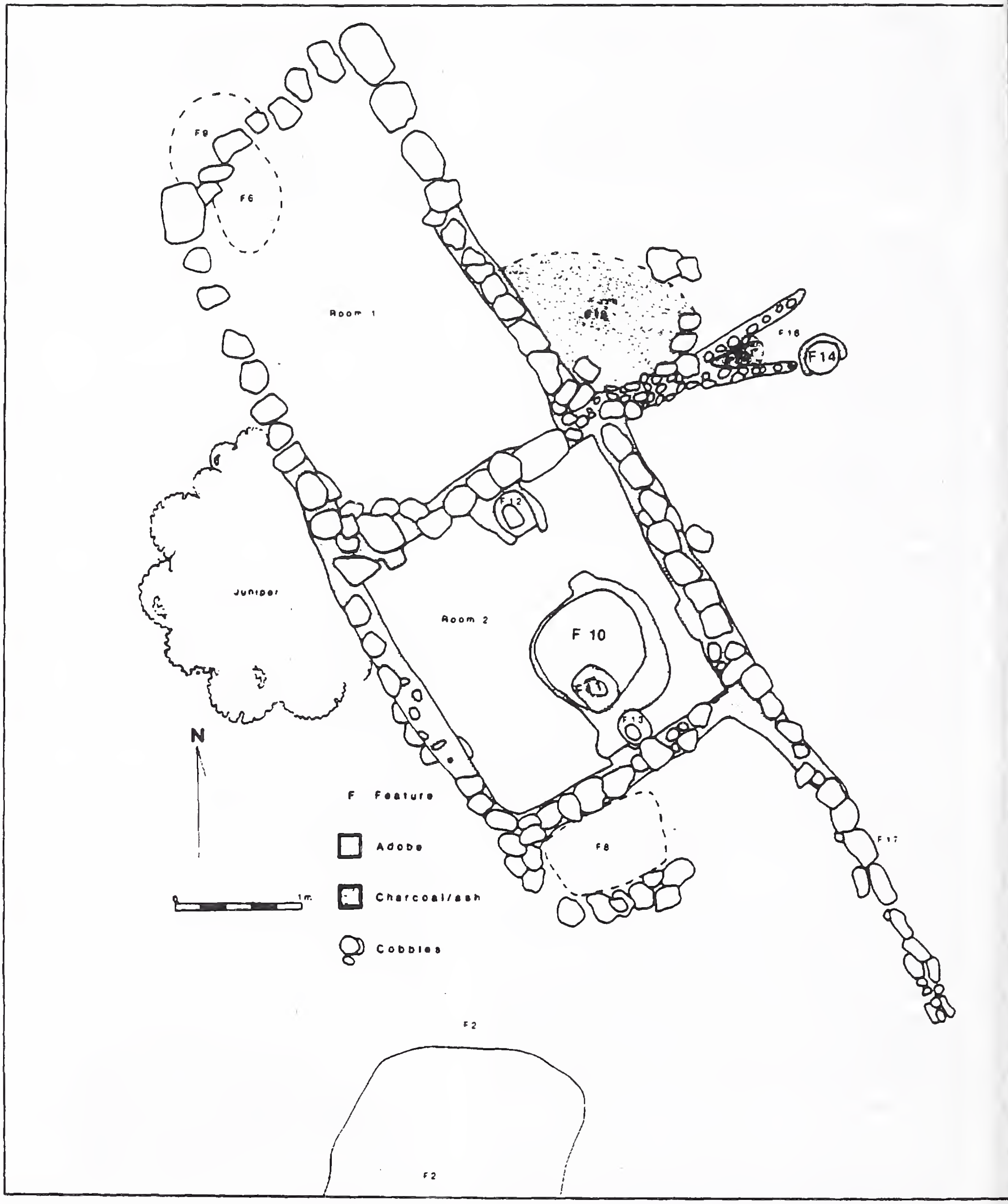
Feature 1: Room 2

The southern room of the structure was roughly square (Fig. 3-7). It measured 2.0 by 2.2 meters in its interior, with its long axis oriented 155 degrees east of north (i.e., roughly to the south-southeast). The foundation characteristics of the room's walls are unknown. No cross-sections were cut through the walls or the lower floor of Room 2.

Little difficulty was encountered in defining and following the walls of Room 2. Walls were constructed of coursed limestone cobbles set in abundant adobe clay mortar; adobe chunks or actual adobe bricks were also commonly incorporated as masonry elements. Some segments were constructed mostly of puddled adobe. Wall bases were thickened at corners and at other points by the addition of extra adobe "buttresses" or reinforcements.

At their highest, the walls were preserved to a height of three to four courses (i.e., about 45 to 55 centimeters of remaining height). The lower courses tended to incorporate few or no cobbles, but stone was used commonly in the upper courses. Walls were typically about 20 to 35 centimeters thick. Most adobe chunks/bricks were roughly cubical to spherical and were about 20 centimeters thick at their largest; typical cobbles were 15 by 25 by 35 centimeters, and were generally laid as single courses rather than as upright slabs or paired courses. Smaller rocks occurred sporadically as chinking, as did adobe lumps. No evidence of doorways was found.

The lower floor appears to have been laid directly on the lower, compact "use-surface" stratum defined in extramural sample excavations. It was relatively thin, reddish-brown to tan-brown, ash-stained, compact adobe, typically only about three centimeters thick. No replastering evidence was noted. No floor features were found in clear association with this lower floor, but



Map 3-3. Features 1 and 2 of Site PL 30A.

Feature 12 (see below) may have been placed on the lower floor. If so, then the feature, a collared basin, was set on a pedestal 15 to 20 centimeters above the floor surface.

Overlying the lower floor was a fill stratum of clean adobe and sandy to clayey soil with few artifactual inclusions. This deliberate fill was usually 12 centimeters thick. It was capped by the upper puddled adobe floor. Within this stratum were encountered Features 10, 11, 12 and 13, all of which probably or certainly pertain to occupation on the upper floor.

The upper floor was a variably-preserved, reddish, puddled-adobe lens, generally about two to five centimeters thick. Several artifacts were found on this floor, which does not seem to have been resurfaced while in use. Associated or probably associated with this floor were several basin features. Feature 12 was set against the center of the north wall; it was an unburned adobe basin with a stone cobble set into the basin floor (Figs. 3-8a, 3-8b). Feature 10 lay in the south-central area of the room; it was a large (85 centimeters interior diameter), unburned, circular, adobe-lined basin originally about ten centimeters deep. The feature had been backfilled partly or completely with roofing daub before

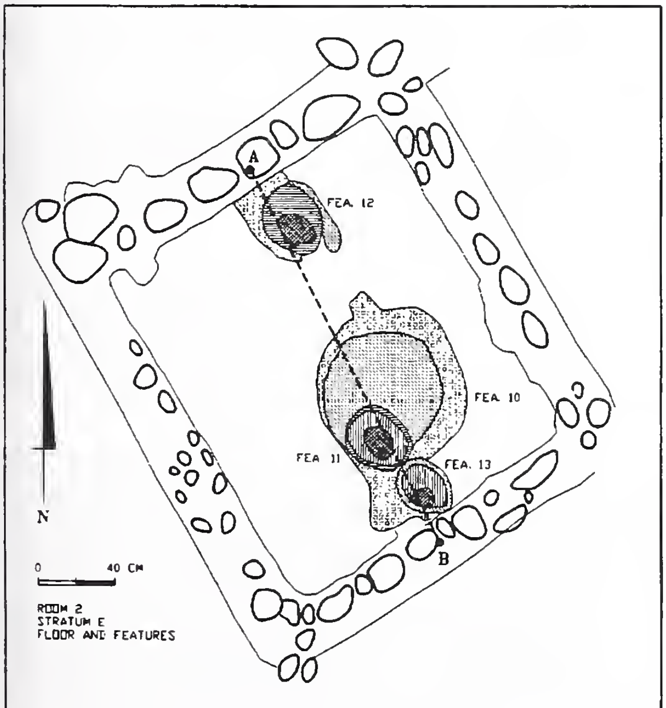


Figure 3-7. Feature 1, Room 2, in Site PL 30A.

Features 11 and 13 were set, respectively, into the daub fill and onto the rim of the feature (Figs. 3-9 and 3-10).

Features 11 and 13 were small (50 by 30 centimeters and 30 by 30 centimeters respectively), shallow (seven to ten centimeters deep), subfloor, adobe-lined basins; the bottom of each was lined with a cobble as was Feature 12. They were set along the room's main axis, with Feature 13 against the south wall and Feature 11 adjacent and lying just to the north. Feature 11 was apparently unburned, but the walls of Feature 13 exhibited scorching. Features 11, 12 and 13 were all filled with ashy sand and silt. Details of construction of these four features were not obtained, as none was sectioned by excavation and stratigraphically profiled.

The walls of Room 2 were plastered with a gray, ashy adobe (Fig. 3-11). This plaster was thickened at its bases near the upper floor, where it merged with the thickened edge of the reddish-brown, adobe floor plaster. The field notes do not indicate whether the walls were plastered below the upper floor, but the site excavation supervisor's preliminary site description seems to imply that wall plaster was also present during the first construction cycle in Room 2.

Overlying the upper floor in Room 2 was a roof fall stratum which averaged about 25 centimeters thick. This stratum was dominated by chunks of daub, but it contained lenses of adobe melt and intermixed wall fall cobbles, together with a fair quantity and diversity of associated artifacts and tools, suggesting that the roof may have been used as a work area or storage surface. No evidence of *vigas* was found, but impressions indicate that the roof surface was formed in a typical way, using a deck of *latillas*, each about five centimeters in diameter. Over this deck was laid adobe with intermixed twigs. The roof apparently did not burn.

A particularly rich concentration of roof fall was found overlying the Feature 10 area in the center of the room (Fig. 3-12). Included were numerous large chunks of adobe, described in the field notes as <u>bricks</u>. This concentration was originally assigned a feature designation (Feature 7). Similar adobe-chunk concentrations in the center of pithouse floors often prove to be reconstructable as roof-entry collars; perhaps entry to Room 2 was through a similarly-prepared opening in the roof.

The roof fall stratum was overlain by the surface stratum. On the mound, this stratum was composed mostly of aeolian sand and organic detritus. It was often only a few centimeters thick. Few artifacts were found in this stratum except at its base, suggesting that the mound had undergone significant erosion, followed by deposition of a sterile surface stratum.

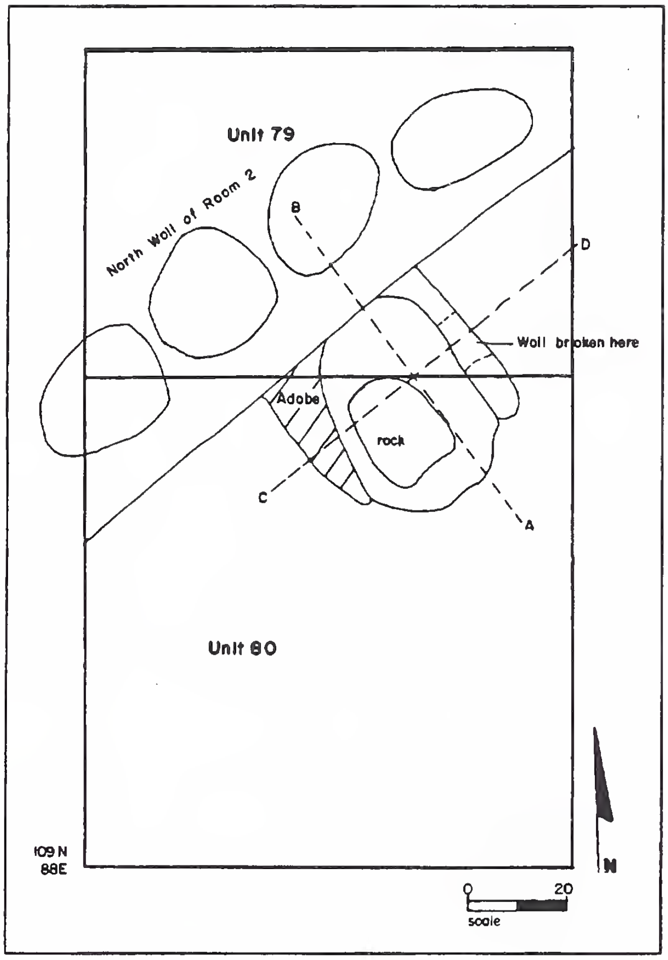


Figure 3-8a. Feature 12 plan, Site PL 30A.

Feature 1: Room 1

The northern room of the structure was rectangular. It measured 1.7 by 2.9 meters in interior dimension, with its long axis oriented as was that of Room 2, described above. The north wall was very poorly preserved, as was the north half of the west wall and the room's northeastern corner.

The remaining walls of Room 1 were relatively easy to define. Walls were founded directly on the lower puddled adobe floor, which may have been used as an exterior surface for some time before the room was constructed. A profile cut through the east wall at 111N (Fig. 3-13) shows construction details similar to those observed or inferred for the Room 2 walls; i.e., a puddled adobe lower course capped by coursed blocks set in abundant adobe. As was the case in Room 2 construction, adobe chunks or bricks, puddled adobe, and coursed stone with abundant adobe mortar and with chinking spalls of stone and adobe were all used in construction. The western

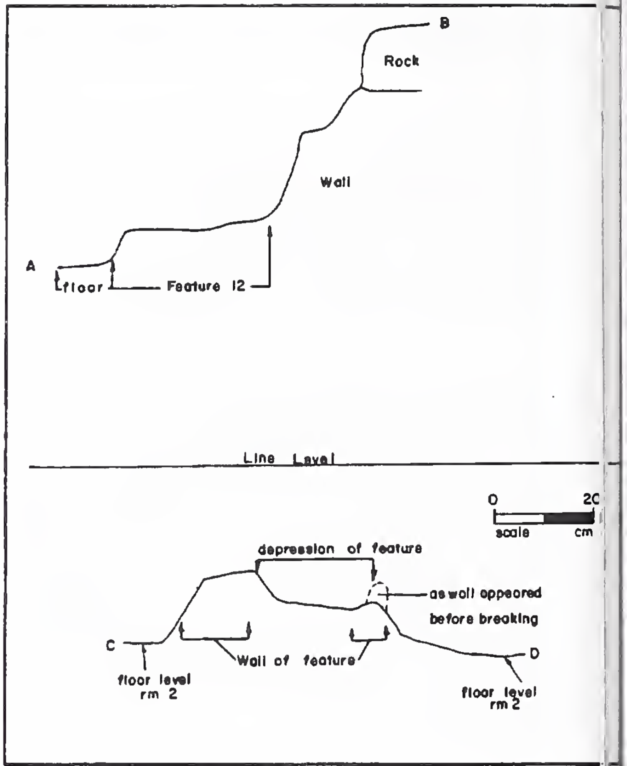


Figure 3-8b. Feature 12 profiles, Site PL 30A.

abutment of the Room 1 and Room 2 walls was preserved (Fig. 3-14).

The northern portions of the east and west walls have been constructed of larger stones, but these ments were badly eroded. The north wall's location construction are somewhat conjectural due to preservation.

Elevation readings suggest that the lower floor was continuous surface between Rooms 1 and 2; cert the composition and character of the lower floor similar in the two rooms. No features and only artifacts were found on or in this floor.

The massive adobe fill over the lower floor foun Room 2 was also present in Room 1, although it se to have been more irregular in thickness and comp tion. Profile data from the south face of Unit 85 sug that the stratum at that point was irregular and 20 t centimeters thick (Fig. 3-15). The same profile sugg the presence of a vertical posthole of about ten centi ters diameter; its center lay at about 112.00N/87.5 Few artifacts were found in this stratum.

The upper floor was poorly preserved in Room 1. Un the Room 2 upper floor, no evidence of floor thicke

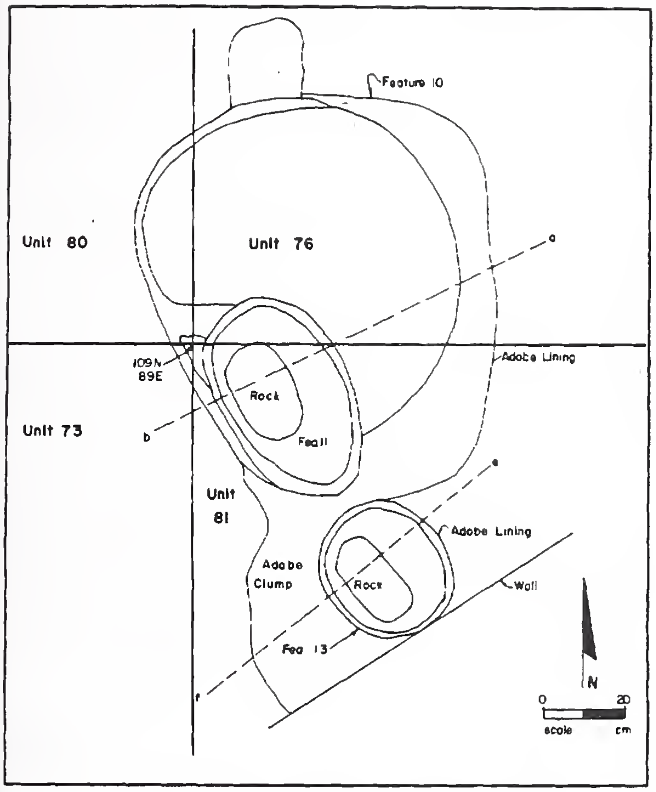


Figure 3-9. Features 10, 11 and 13 of Site PL 30A.

near the walls was seen; no interior wall plaster was noted, but exterior plaster may have been preserved. Both of these observations may be the result of generally poor preservation of the room. An example of poor preservation may have been recorded in Features 6 and 9. Feature 6 was recorded as an unstructured, soft anomaly in the upper floor just inside the north wall of Room 1. Feature 9 was described as an adobe deposit lying outside the structure just across the north wall from Feature 6. It is possible that these two phenomena are related aspects of burrowing disturbance. If so, Feature 6 is probably a collapsed and filled-in burrow, and Feature 9 may be the adobe spoil, possibly from the lower floor fill stratum tossed out of the burrow to the north, over the already disarticulated north wall. Regardless of their actual origin, neither "feature" seems to have been culturally produced. No definite cultural features were found on the upper floor of this room. No artifacts were found in floor contact.

The roof fall stratum and surface stratum were similar in Rooms 1 and 2. Debris was found indicating similar roof construction in both rooms. Again, no evidence of *vigas* or of burning was found. The roof fall assemblage in Room 1 was less complex than that from Room 2, perhaps indicating that the Room 1 roof may not have been substantial enough to provide a living or working surface. This inference is strengthened by the observation that fewer artifacts were found on the (perhaps deflated) roof fall/surface stratum contact over Room 1, suggesting again that a less-rich assemblage was present on the roof of this room.

Feature 1: Southern Exterior Area

The southern exterior area is composed of two features, and the area lying between them, immediately south of the southern wall of Room 2. Feature 8 is a pedestalled

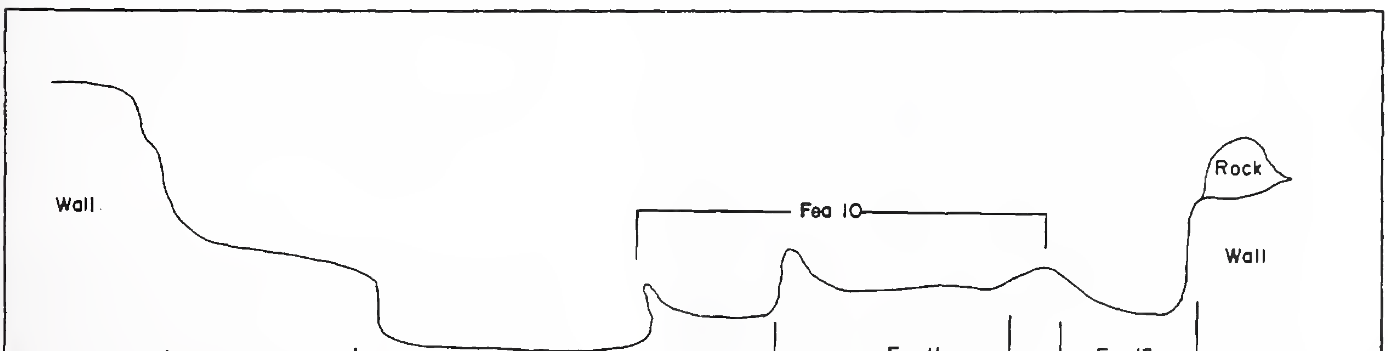


Figure 3-10. Profile of features 10, 11, 12 and 13 of Site PL 30A.

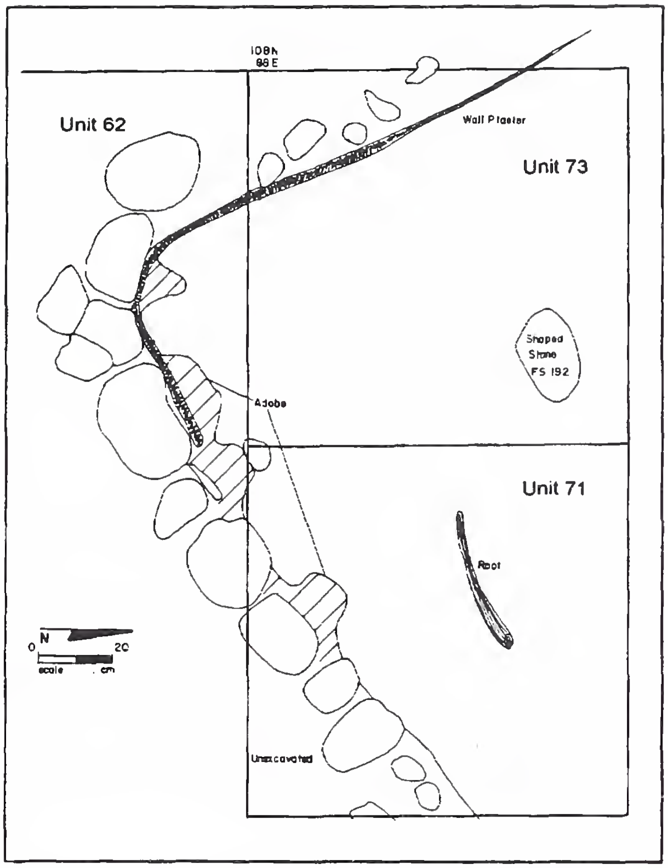


Figure 3-11. Plaster on the interior wall of Room 2, Site PL 30A.

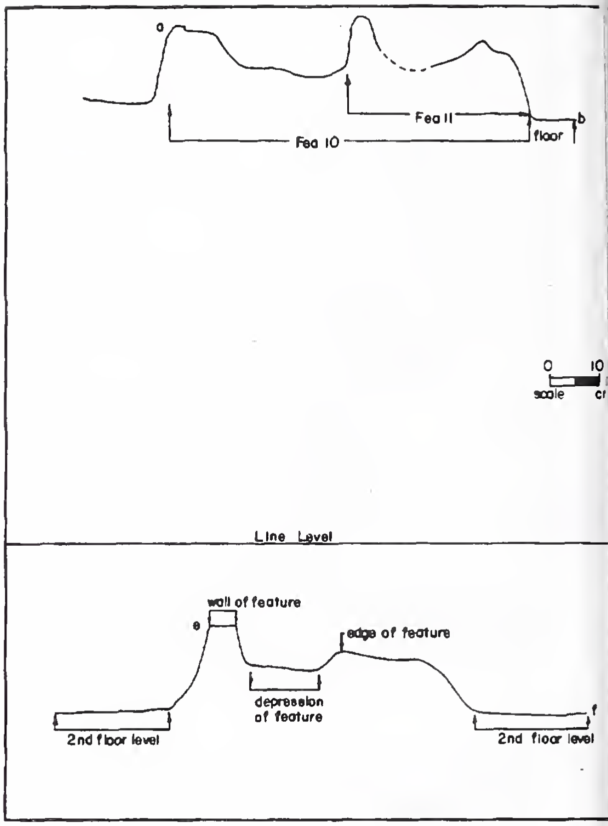


Figure 3-13. Profiles of Features 10 and 11 (top) and of Featu 13 (bottom).

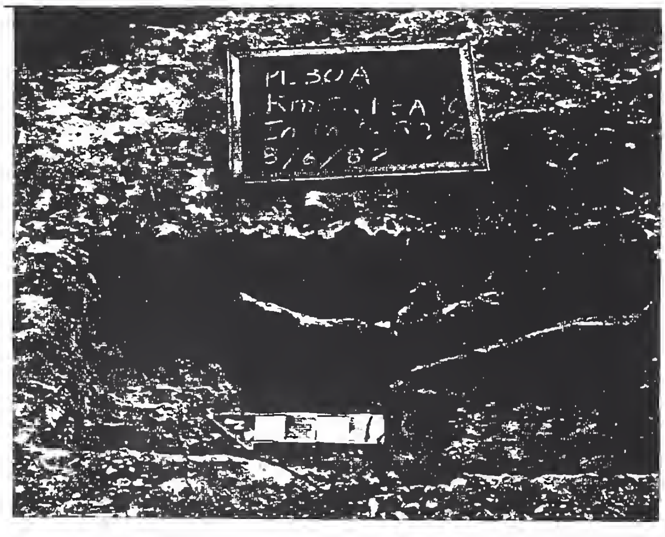


Figure 3-12. Roof fall uncovered in the area of Feature 10, Site PL 30A.

surface of adobe about 17 centimeters high and abo 75 by 45 centimeters in extent. It is set against th western half of the southern exterior wall of Room The pedestal had a prepared and compact adob surface, set off from the Room 2 south exterior wall b a shallow, adobe-filled gutter trench (dimensions un known). This trench may have been built as a delibera gutter, or may be the result of water erosion fro structure run-off.

The pedestal was bounded or faced on the south an west by dry-laid cobbles set two or three courses high It was found to have been built over a more extensiv puddled surface (17 centimeters deeper) lying at th same elevation as the upper floor of Room 2. Severa flakes and a sherd were found incorporated into th pedestal or associated with the upper or lower sur faces.

Feature 17 is a south wing wall, probably built at th same time as Room 2 and extending on the line of th Room 2 east wall for another three meters to the south southeast. It was less sturdily constructed than th

Room 2 wall of which it is a continuation. The wall tapers from a width of 25 to 30 centimeters at its junction with the Room 2 southeast corner to a width of only 10 to 15 centimeters at a distance of one meter south of that junction.

The northern meter of the wall's length was tied by overlap of masonry elements into the Room 2 southeast corner (Fig. 3-16). It was built in a manner similar to the Room 2 wall, of adobe-footed, coursed, single-row cobble construction using copious adobe as puddle, as mortar and as chunks or bricks. The middle portion of the wall was built of large cobbles with little adobe; excavation may have ceased before the adobe footings typical of the Room 2 wall were revealed. The remaining meter of the wall's length was of paired-course construction using two rows of small-to-medium flat cobbles set upright in sparse adobe mortar (Map 3-3). It is not clear whether the entire length of the Feature 17 wall was built in one construction session or whether the central single-row masonry section and the lightly built southern paired-course masonry segment were added at a later date.

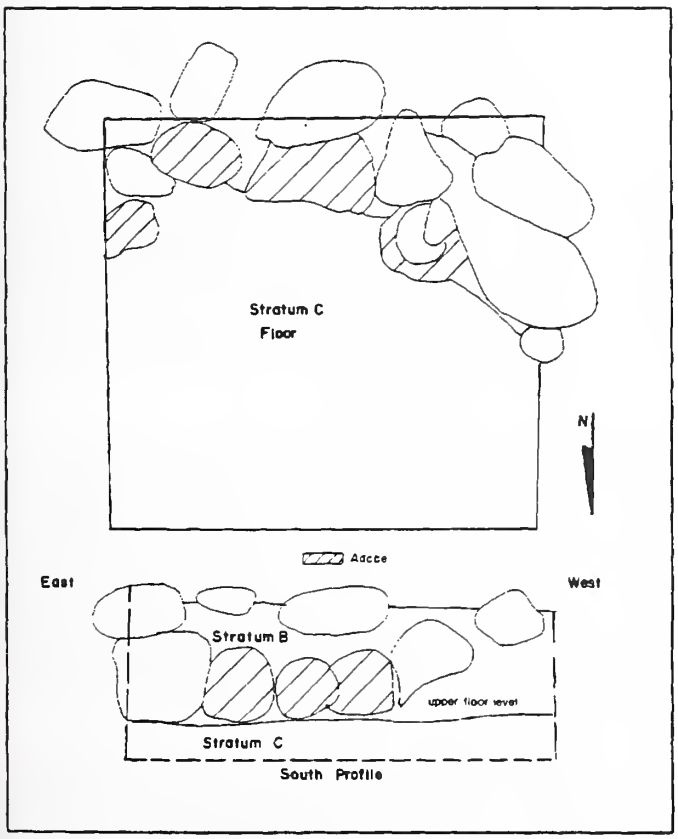


Figure 3-14. Plan and profile of Feature 1 in Unit 75, Site PL 30A.

The excavators seem to have concluded that the feature was best interpreted as a ramada wall base, a view which would normally be taken to imply the presence of timber uprights associated with either the use area, or the wall segment, or both, but no evidence of included or associated postholes was reported. Perhaps the field interpretation was based on the apparent insubstantiality of the Feature 17 wall. The feature was never dismantled.

Excavations along the wall recovered numerous artifacts in the area to the west, adjacent to Feature 8, but few or no artifacts immediately to the east. An indistinct ash lens was discovered in the dried profile of Unit 11, centering at about 107.5N/92E, and lying at about 9 to 15 centimeters depth, possibly associated with several artifacts. It was not further excavated.

The ash lens in Units 11 and 88 may indicate that the use-surface lies at a shallow depth in the area east of the Feature 17 wall, but this is unclear. Notes and photographs provide insufficient data to determine if excavations in the southern exterior area ever reached either the original construction surface or the adobe paving which one would expect to find capping that surface. On the basis of reported excavation depths, it seems possible that there were earlier cultural deposits, in the southern exterior area, which were never dug.

Feature 1: Eastern Exterior Area

The eastern exterior area is composed of a wing wall (Feature 16), associated adobe-paved use-surfaces, a collared hearth (Feature 14), three probable postholes, and two ashy midden lenses which may represent parts of a single deposit (Features 5 and 15). This area lies immediately east of the eastern wall junction of Rooms 1 and 2 (Fig. 3-17).

Feature 16, the eastern wing wall, extends east-northeastward from the junction of the eastern and middle walls of the structure for a distance of 1.5 to 2 meters; uncertainty about its length is a result of erosion and also of poor construction of the somewhat hypothetical eastern end. It appears to have been constructed by laying a puddled adobe footing directly atop a thin (five centimeters) stratum of silty loam, which in turn lay atop the deepest prepared adobe surface found in the eastern exterior area. The prepared surface was probably continuous with the lower floor of the room block. Into this adobe footing were laid cobbles, most of which were no larger than 20 centimeters in greatest dimension (Fig. 3-18).

Field notes are not in agreement on the exact character of the Feature 16 wall, but it appears that the wall either

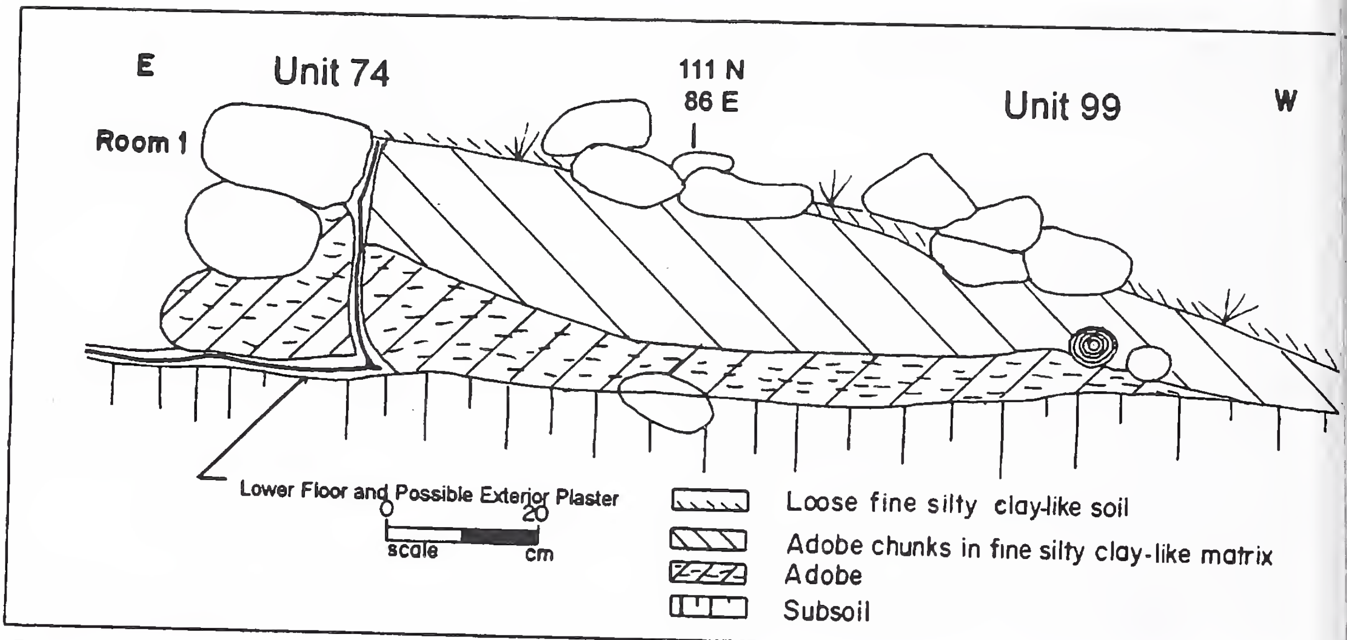


Figure 3-15. Site PL 30A; plan and profile of the south face of Unit 85.

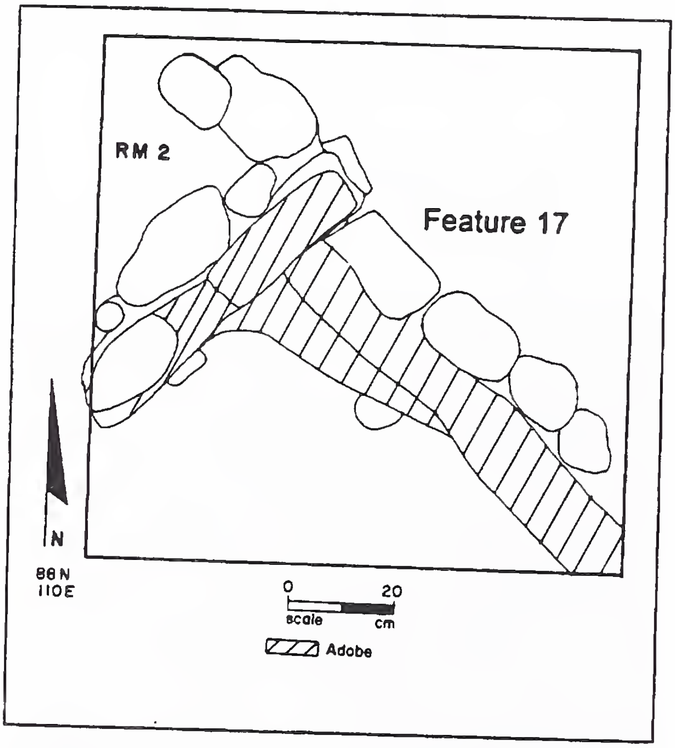


Figure 3-16. The wall bond at Room 2 and Feature 17 in Site PL 30A.

forked into two walls or else was demolished and rebuilt along an alignment trending a few degrees farther north than its original trend. The northern alignment or fork was apparently built after the southern one and w better preserved. The field supervisor's notes indic that the northern wall alignment overlay stained (presumably the silty loam) which may have be stratigraphically equivalent to the Feature 15 midder the northwest. The stained soil seems also to have be continuous with the northern edge of the Feature midden remnant, which lay between the north a south alignments. The southern alignment was ne clearly defined in excavation. Different renditions of location and character probably reflect different ind vidual interpretations of the rather amorphous mass layered adobe which was all that remained of th feature at excavation.

Features 5 and 15 may have been portions of the san lens; they seem to represent ash and artifact dumps (i.e localized sheet midden) rather than hearths. No ev dence of burning was noted at the base of either featur Artifacts and samples were collected from both feature Three possible postholes were noted in excavations i the area of Features 5 and 15, with centers lying a 111.62N/88.93E, at 11.62N/89.65E, and at 111.16N 90.10E respectively. The westernmost posthole con tained charred wood, which was collected.

A compacted surface with associated ash, ceramics, an lithics was encountered in Units 90, 91, and 94, all o which were located to the north of the Features 5/15/1 complex. Whether this represents a recent deflation surface or an intact use-surface or puddled pavemen cannot now be evaluated. The surface of the site sloped down in this area to below the level of the lower prepared surface under Feature 16.

Field notes indicate that another, more definite, use-surface of puddled adobe was encountered in Unit 83, just to the south of Feature 16. This surface had been repaved or recompacted several times, as thin adobe plates could be popped off with a trowel. It seems likely that the surface in this area was a higher surface than the one which underlay Feature 16; the two surfaces differ in elevation by about 30 centimeters but are described as lying only about 50 centimeters apart horizontally. The southern surface was apparently never subfloored. Associated with it were lithics, ceramics, and what may have been unused, unfired rolls of pottery clay. Other artifacts found a meter or so farther southeast (in Unit 66) may have deflated down from this surface, or may have been in situ on the hypothesized lower surface.

Feature 14 was a small, shallow (35 by 45 centimeters by about five centimeters deep) basin hearth found a few centimeters below the soil surface as excavations were ending at the site (Fig. 3-19A). The hearth lay just to the east of the east end of the southern branch of the Feature 16 wall (Fig. 3-20). It was described as an ash-filled, collared surface hearth, with the adobe collar being well-preserved only on the hearth's western side. Burning was evident on the hearth's clay lining. It seems to have lain at or below the level of the lower exterior surface which ran beneath Feature 16, suggesting that it may have been a subsurface basin hearth in a higher surface which was misinterpreted as a collared hearth built up from the lower use-surface. If so, then it can be only ambiguously associated with either of the possibly superimposed surfaces found nearby.

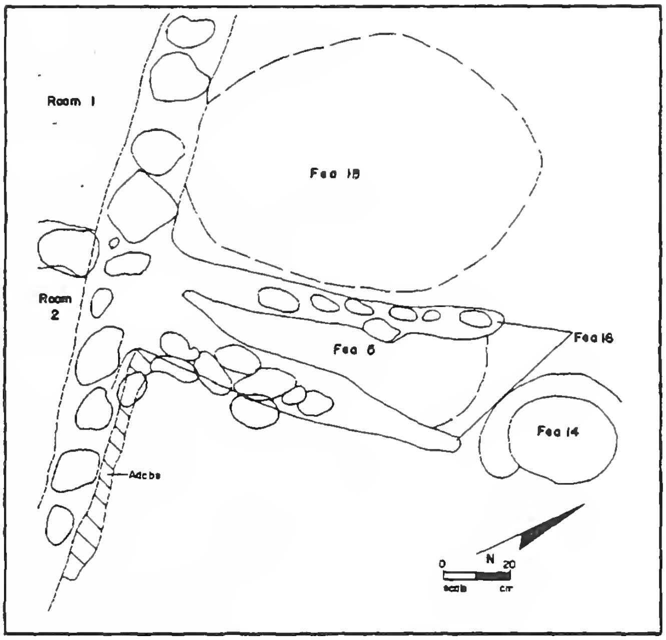


Figure 3-17. Complex of eastern external features at Site PL 30A.

Feature 1: Chronology and Samples

Data for the interpretation of the architecture and stratigraphy of the Feature 1 complex were obtained from analyses of ceramics, pollen, macrobotanical specimens, obsidian hydration, radiocarbon samples, and bone. Each of these data sources will now be discussed.

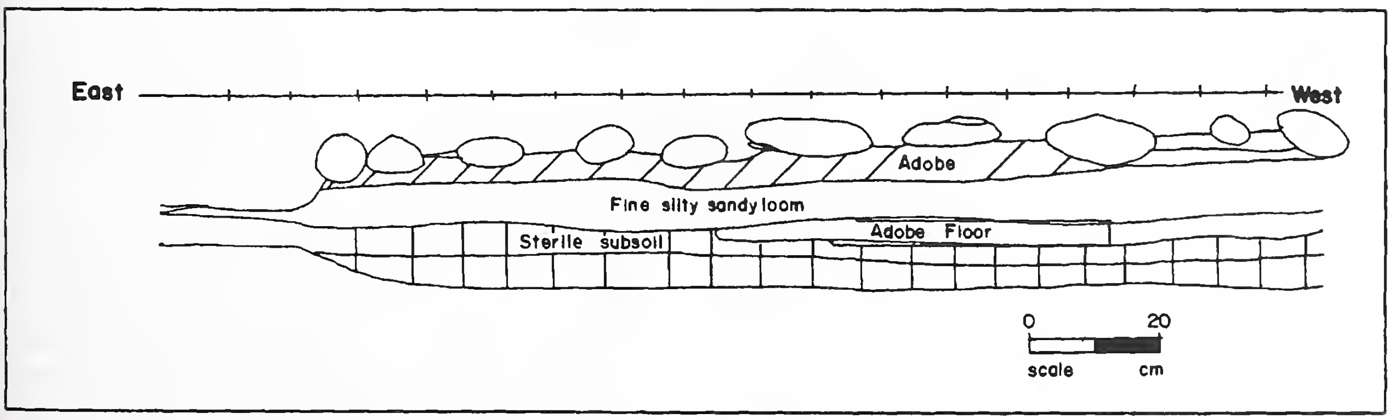


Figure 3-18. Lengthwise cross-section of the northern branch of the eastern wing walls in Site PL 30A.

Ceramics from the structure and its associated areas were collected on the original survey and in the course of excavation. No information is available at this writing on the numbers of sherds collected, but it is known that at least nine sherds were collected on survey. These included four decorated sherds, two plainware sherds, and three indented-corrugated sherds. Of a total of 282 field specimen numbers assigned during excavation, 76 (or 27 per cent) were assigned specimen collections which included ceramics.

The brief analysis summary by Warren and Warren (this volume) indicates that three sherds from Feature 1 associations were fully analyzed. These included a Cebolleta B/w bowl sherd from Room 2 roof fall, a second Cebolleta B/w bowl sherd (from a different vessel) from just west of the southern wing wall, and a Socorro B/w jar sherd from upper floor contact deposits in Room 2. Unprovenienced and untabulated decorated types mentioned in this report include Kwahe'e B/w, Red Mesa B/w, Red Mesa/Kiatuthlanna B/w, Kiatuthlanna B/w, Gallup B/w, Gallup (Prewitt) B/w, Cebolleta B/w, and Socorro B/w. The site produced at least 22 sherds of an indented corrugated utility ware which was typed as Tusayan Corrugated (micaceous), and also two utility sherds which were typed as Tohatchi Banded. Several polished plain brownware sherds were also present.

Figure 3-19a. Feature 14 of Site PL 30A.

On the basis of paste and temper, Warren believes that the corrugated, banded, and Kwahe'e pottery may have been indigenously produced, that the brownwares were proba imports from south-central N Mexico, and the other decora wares were probably imported fr west-central New Mexico. She wo suggest a date range for the sit about A.D. 900 to 1100; essentia this range covers the full Puebl period as it is now understood a might also include the earliest p tion of the Pueblo III period. Fi descriptions include no referen to the presence of styles or ty which would contradict this asse ment.

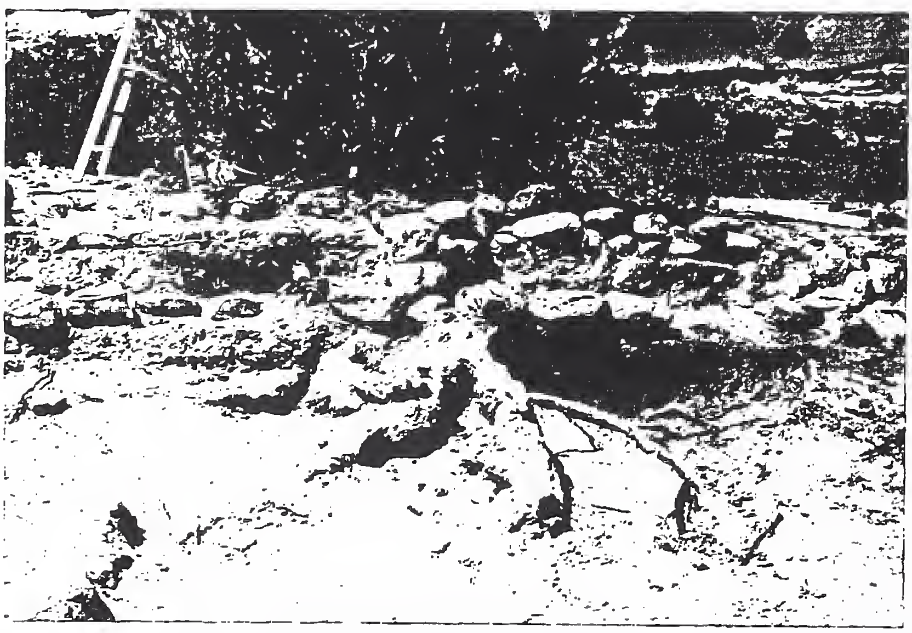


Figure 3-19b. Feature 1 of Site PL 30A. The view is southwest.

Evidence of actual pottery ma facture at PL 30A may have be recovered from Units 74 (outs the west wall of Room 1) and 83 (southern portion of the eastern terior work area). In bo proveniences, pieces of "coiled/rol clay or adobe, unfired" were c

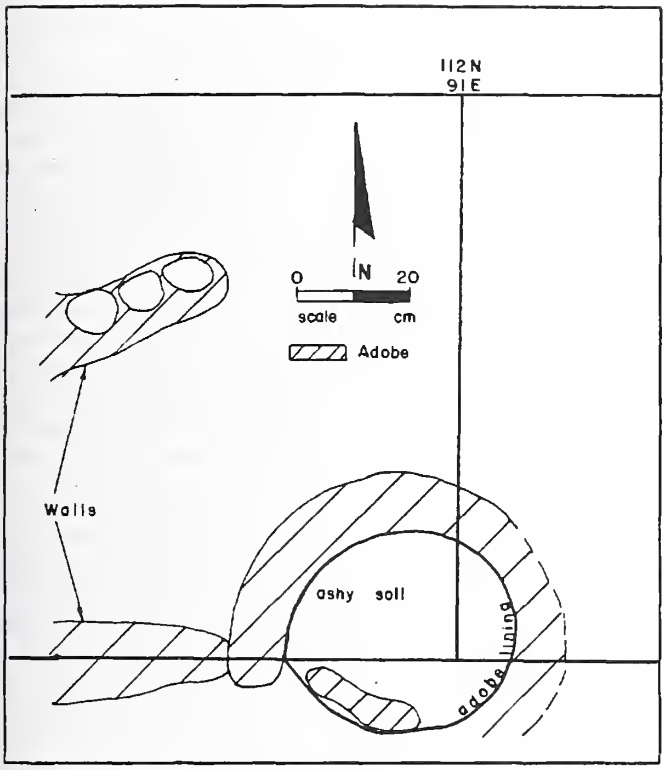


Figure 3-20. Plan of Feature 14 in Site PL 30A.

lected. No further data on these specimens are available at this time.

Fifteen pollen samples were analyzed from PL 30A; all are from provenlences within the Feature 1 complex (Scott, this volume). Their contents will be briefly summarized; mention will be made of pollen from cultigens, of possibly non-local pollen aggregates, and of pollen found in unexpectedly high frequencies.

Roof fall from Feature 7 in Room 2 produced cattail, *Labiatae* (mint and congeners), and globe mallow pollen. Interior upper floor/roof fall contact loci produced corn, tree cholla, and high-spine composites (sunflower, rabbitbrush, snakeweed, etc.) pollen from Room 1 and corn, Cheno-Am (pigweeds, saltbush and goosefoots), tree cholla, and *Solanaceae* (nightshade, tomatillo, tobacco, chili, etc.) pollen from Room 2. The upper floor context in Room 2 produced Mormon tea aggregates; the lower floor in Room 1 was rich in high-spine composites.

Interior features also were heavily sampled for pollen. Feature 10 fill (thought to be deliberate) contained *Tidestromia* and grass pollen aggregates, as well as low-spine composite (ragweed, cocklebur, weeds) and Cheno-Am pollen. Feature 11 fill contained corn and high Cheno-Am pollen counts. Feature 13, which seems to have been the only interior hearth in the structure, contained globe mallow, yucca, corn, and *Cruciferae* (mustards, cabbages, etc.) pollen.

Exterior surfaces produced little pollen, except where surfaces had been prepared, sealing in pollen. The surface under the Feature 16 wing wall yielded juniper, oak, and grass aggregates. The upper surface of the Feature 8 "pedestal" yielded prickly pear, corn aggregates, high-spine composites, *Tidestromia*, Cheno-Ams, and sagebrush pollen. The small exterior hearth, Feature 14, contained Mormon tea, sagebrush, and high Cheno-am counts; the Cheno-am pollen included aggregates and an anther fragment. The ill-defined stain at the extreme north end of the eastern exterior area produced beeweed, Cheno-Am, *Tidestromia*, high-spine compositae, and cholla pollen.

The environmental pollen background common to these samples indicates a dry but fairly dense juniper woodland; other species present on or very near the site would include saltbush, other Cheno-Ams, sagebrush, low-spine composite weeds and *Tidestromia*. Grasses seem not to have been common near the site. Scott interprets the other pollen types as perhaps reflecting corn processing, storage, and general use, as well as possible exploitation of high-spine composites, Mormon tea, grasses, cholla, prickly pear, beeweed, mints, and Cheno-Ams for subsistence or materials. Oak may have been used in the construction of the east wing wall or processed in nearby features. The roof of the structure probably contained cattail *latillas*; cattail may also have been processed or stored for food on the roof. Undoubtedly, juniper was used for fuel on the site, but this cannot be demonstrated solely from the juniper-dominated pollen spectra of the samples collected from this site.

Macrobotanical samples from the Feature 1 complex were disappointing; of the 19 samples from this provenience group, only five produced materials meriting comment (Toll, this volume). All other samples were barren, contained only unidentifiable flecks, or contained only unburned and presumably modern plant parts. Corn cobs were found in Feature 11 fill, and on the lower floor of Room 1. Burned corn was found in the eastern work area, in either the Feature 5 sheet midden sample or in the Feature 14 external hearth fill (the field specimen catalog is ambiguous here). Juniper charcoal was found in field specimen 281, which actually was collected from the Feature 5 sheet midden. (Toll was apparently given an incorrect Room 2 interior provenience for this specimen.) A charcoal sample from the fill/lower floor contact in Room 1 contained 80 percent juniper charcoal and a small proportion of saltbush charcoal.

No archeological bone was found at PL 30A (Akins, this volume; Bertram, this volume). The only item recovered and analyzed was a cottontail rabbit hind leg bone from the surface stratum of Room 2. This specimen is a modern intrusive with flesh adhering; it cannot pertain to the Puebloan occupation of the site.

Four radiocarbon samples from the Feature 1 complex were submitted and analyzed (Table 3-1; see page 112). Of these, only one was drawn from the interior of the structure, specifically from the Feature 7 roof fall deposit on the upper floor of Room 2. It produced a best estimate date of A.D. 890 and a midpoint date of A.D. 910, using the consensus calibration tables and graphs of Klein et al. (1982), with 95% confidence limits of A.D. 585 and A.D. 1235.

The other three dates were drawn from deposits within the eastern exterior area. Two seem quite early, and one is more consistent with the dates from Room 2 and from Feature 4 (discussed previously). The early dates were obtained from the Feature 5 midden deposit and from the Feature 14 hearth. Feature 5 produced a best estimate date of A.D. 635 and a midpoint date of A.D. 720, with 95% confidence limits of A.D. 400 and A.D. 1040, using the Klein et al. tables and non-monotonic curve.

The second early date is drawn from the fill of the Feature 14 hearth, ash from which may have been dumped to form Feature 5 and perhaps Feature 15 as well. Feature 14 produced a non-monotonic best estimate date of A.D. 630 and a midpoint date of A.D. 680, with 95% limits of A.D. 335 and A.D. 1025. The similarity of dates from the two features may strengthen the possibility that they are functionally related.

The more consistent date from the eastern use area was drawn from a probable post, collected from within Feature 15 (Unit 56), adjacent to the exterior of the Room 1 east wall. This sample yielded a non-monotonic best estimate date of A.D. 775 and a midpoint date of A.D. 795, with 95% confidence limits of A.D. 365 and A.D. 1225; the small sample produced a date with an unfortunately high standard error (± 380 years uncorrected). This date is not very different from the date obtained from Room 2 roof fall or from the date obtained from Feature 4.

Overall, the radiocarbon data tend to cluster into two groups, the older being in the neighborhood of A.D. 670, and the younger being in the neighborhood of A.D. 840. Clearly, structural wood from roof members and posts may have been dated in two of the three cases having later dates, while the two earlier dates may reflect a single episode of old wood burning or perhaps even an otherwise undocumented earlier occupation of th
This latter possibility seems unlikely.

It is not unreasonable to expect unrecycled struc
wood to date on the order of 10 to 50 years befo
cutting date; old downed timber makes poor beam
posts. It is also not unlikely that fuel wood mig
quite old (averaging on the order of 125 years or r
at the time of burning; fuelwood may be even older l
wood and need not be sound wood. Taking the si
average of dates for the two date clusters, we see tha
fuel wood dates are about 170 years older than
structural wood; again, this range is not entirely un
sonable if old juniper snags or old, downed ma
juniper trunks were the primary source of fuel. I
juniper snags can last a long time before falling, and
rot very slowly relative to other fuel woods.

We may then guess a terminal occupation date, base
the corrected radiocarbon dates and the argum
outlined above, by adding 25 years to the later (st
tural) date cluster; this gives an estimated occupa
date of about A.D. 865. This would imply that fuel w
was <u>on average</u> 195 years old when burned. Th
estimates are almost plausible; a mature juniper wh
has been dead for only 40 years might easily y
average bulk radiocarbon agés on the order of 120 ye

If one elected to trust the roof fall date from the up
floor of Room 2, then the estimated date of abandonm
would be about 35 years later (about A.D. 900); no
wood correction would be implied, since no evidenc
any wood other than *latillas* was found. *Latillas*
course, could have been only a few years old at cutti

The resulting radiocarbon-based guess dates for
final occupation (early to middle ninth century) wo
seem to be only about a century too old, relative to
dates implied by the ceramic assemblage from PL 3
(tenth to late eleventh century). We have little reason
doubt the ceramic chronology. Inference from deco
tion styles on painted vessels as a method of prec
dating may be disputed, but there are <u>no</u> publish
dates from a secure provenience which would place a
indented-corrugated utility ware (characteristic at
30A) in New Mexico earlier than the last years of t
ninth century.

The radiocarbon and ceramic association dates, ho
ever they are viewed, are clearly inconsistent with t
dates inferred from obsidian hydration. The obsidia
hydration data from Features 2 and 4 have been di
cussed previously. Obsidian hydration results from t
immediate area of Feature 1 will now be presented ar
discussed.

A total of eight obsidian hydration dates were determined for specimens collected in or near the Feature 1 complex (Table 3-2; see page 112). All were visually sourced. The youngest inferred date from this sample set is 1155 B.C. for a specimen thought to be of Cerro del Medio (type 3500) obsidian. If the actual source was Obsidian Ridge/Rabbit Mountain (type 3520/3525), which is the fastest-hydrating of the typical Jemez obsidians, then the correct inferred date would be A.D. 66. The other seven dates are all older. They are inferred from hydration rinds of 6.2 to 7.9 microns' thickness; most were thought to be Cerro del Medio obsidian. If all were actually from the faster-hydrating Obsidian Ridge/ Rabbit Mountain source, the implied date range for them would be 3570 B.C. to 1450 B.C., still clearly too old for their context.

Among the eight samples are three more arrow points of the generalized side/corner notched type with convex to straight bases (Fig. 3-21), like the specimen from Feature 4. One of the points (FS 240; Unit 73) was found in good context on the lower floor/fill contact in Room 2. On typological grounds, these points should certainly not date before the origins of bow use in the Rio Grande area, and they could date as late as the Historic Period (Thoms 1977; Bertram 1987). On associational (radiocarbon and pottery) grounds, non-concave-based, side/ corner notched arrow points should date to about A.D. 850-1100. They appear to date by hydration to the range of 1450 B.C. to A.D. 66, using the Obsidian Ridge rate.

Given that earlier types of points are rare or absent in the site, that no other evidence of an Archaic occupation was found, that the site seems to have only a single component, and that obsidian was clearly reduced on site by the Puebloan occupants, we would expect much later obsidian dates for at least some specimens. As no such later dates were recovered, we must dismiss the possibility that <u>all</u> of the early obsidian dates from the structural area reflect reuse of tools from an earlier Archaic occupation. A generalized Archaic use of the area may be present, but some of the dated obsidian is surely Puebloan.

Five more obsidian dates were derived from specimens associated neither with the outlying thermal features nor with the structure-associated features (Units 10, 19, 20 and 27). They all produced results within the very early obsidian date range from the Feature I complex and from Features 2 and 4.

We must conclude that obsidian hydration results for PL 30A are systematically too old and simply unacceptable for unknown reasons. These reasons probably include shallow burial, incorrect assessment of thermal regime, exposure to solar-related and fire-related thermal damage, and incorrect sourcing (see Bertram and Burgett [this volume] for a much more detailed discussion of these issues).

Accurate data on lithic artifacts and chipping debris from this site were not available at this writing; the final lithic analysis is presented elsewhere (Bertram, this volume). In order to incorporate as much information as possible into this analysis, I elected to work with the incomplete analysis manuscripts available. These included three different listings of artifacts by field specimen number, count, provenience, artifact type, and material type. I also incorporated data from stratum/level forms, field notes, and the field specimen log. The results are summarized in Tables 3-3 and 3-4; the original listings and the new listing produced for this report are on file with the Cibola National Forest. The results of my efforts to assess the lithic assemblage are undoubtedly unreliable; no two of the original sources agreed fully on proveniences, counts, types, or material types. The reader should recognize that all counts, typological statements, locational assertions, and interpretations of lithic artifacts presented in this report are tentative at best.

Interpretations

The functions of the structure and exterior features at PL 30A are unknown. There are insufficient data from the area to construct a small-site typology such as that employed in analyses of sites from the Farmington portion of the Elena Gallegos Project (Raish n.d.; Bertram, n.d.a). However, tentative interpretations may be advanced based on the results from PL 30A alone.

Based on what is known of site typology and function from other Anasazi and Puebloan areas, it seems likely that most small sites having structures may be classified either as small farmsteads or else as field houses. The difference between these two site types is mostly one of seasonal occupational pattern. Field houses were occupied only during the growing season, with occasional short visits during other seasons in the course of logistic trips or travel. Small farmsteads were occupied by portions of the local group for most or all of the year.

If PL 30A had been a small farmstead, evidence of year-round occupation and especially of winter residence should have been present. Such evidence would include: heavily burned residential heating facilities; accumulations of trash, ash, and charcoal from those facilities; substantial storage facilities; and evidence of winter subsistence. The basins within the structure are not obviously burned, with the possible exception of Feature 13. Room 1 had no hearths at all.

Table 3-3. Approximate Artifact Counts for Site PL 30A (from notes).

Unit	Strat	Locus/Feature	Debitage Count	Ceramics Present?	Formal tools (See Table 3-4)
1	A		2		4
2	A		P		
3	A		1		
4	A			P	
6	A			1	
6	B			P	
7	A		6		
8	A		4	1	
9	A		8		
10	A		5		
11	A		4		
11	B		3		1
12	A		3	P	
13	A		2		
13	B		1		1
14	A	Feature 2	10		
14	B	Feature 2	2	P	
15	A		6	P	
17	A		5	P	
18	A		3	P	
19	A		2	P	
20	A		1	P	
22	A		4	P	
23	B	Feature 2			1
24	C		1		
25	A		4		
26	A		3		
27	A		4	P	
28	A		21		
29	A		6	P	
30	A		3		
31	A		1		
35	A		3		1
36	A		2		
37	A		4	P	
38	A		1		
39	A		3	P	
40	A		6		
41	A		2	P	1
42	A		4	P	
43	A		5		
44	A		3	P	2
45	A		8		
46	A		2		
47	A		3		
48	A		7		
49	A		7	P	1
50	A		1		
52	A		1		
54	A		2	P	
56	AO		2	P	
BO		1	P		
AI		2	P		
DI		1			
59	A		2		
60	A		4	P	
62	A	F.1	1	P	
B	Room 2	2			
C	Room 2	1			
D	Room 2	2			
63	A		2		

Table 3-3. Approximate Artifact Counts for Site PL 30A (from notes) (Continued).

Unit	Strat	Locus/Feature	Debitage Count	Ceramics Present?	Formal tools (See Table 3-4)
63	B		4	P	
64	A		2		
66	A		2		2
67	A		1		
68	A		1	P	
	B		1+	P	
	C		1	P	
70	A			P	
	B	Room 1	1	P	
71	A		4		
	B	Room 2		P	1
	D		2		
72	BO	Room 2	1		1
	BI	Room 2		P	
73	A	Room 2	1		
	B	Room 2	1		
	C	Room 2			1
	D	Room 2	8		1
74	A	Room 1	1		
	B	Room 1	1	P	
	E	Room 1	2		
75	B	Room 1	1		
	D	Room 1	2		
76	B	Room 2	2		2
	C	Room 2	1		
	D	Room 2	1	P	
77	B	Room 2	2	P	
78	B	Feature 1	3		
79	BI	Feature 1	2	P	2
80	A	Room 2			1
	B	Room 2	2	P	4
	C	Room 2	1	P	
	D	Room 2	3		
81	A		1		
	B		2	P	
	D		1		
82	B		2	P	
83	A		P	P	
	B		P	P	
84	A	Room 1		P	
85	A	Room 1	1	P	1
	B	Room 1		P	
86	A	Room 1	1	P	
	B	Room 1	1	P	
	D	Room 1		P	
87	A	Feature 1	5	P	
88	B	Room 1	P	P	
89	A	Room 1	1		
	BO	Room 1	14		1
	BI	Room 1	1		
90	A		1	P	
91	A		11	P	
	B		P	P	
	C		3		
92	A		4	P	
	B		P		
93	A		1	P	1
94	A		3	P	
95	A		14	P	
99	A/B		1	P	

Notes: 1. Units with no artifacts not reported. 2. BO = Level B, outside; AI = Level A, inside, etc.
3. P in Debitage Count indicates Present, no count found in notes.

No rich exterior ash and refuse midden accumulations were found at the site, although the eroded condition of the site area should have allowed their detection, at least as dense concentrations of sherds, lithics, and burned rock fragments. Winter subsistence in the prehistoric Puebloan Southwest relied heavily on hunting and consumption of stored foods. Common archeological consequences of these patterns are the accumulation of worn-out ground stone items and discarded plant matter (from grinding dried plants, shelling nuts, processing seeds, and reconstituting dried meat), and of processed and often burned bone scraps (from consumption of the non-storable parts of fall and winter game and from the use of bones as fuel). This site produced no pinyon nut shells, little interior pollen from definitely stored plants, and no burned bone.

Field houses were the loci of short-term occupations during the busy periods of the growing season. They usually have little bone, as there is little time to hunt during the planting, irrigation, and harvesting times. They may be expected to lack interior heating facilities, as the weather is generally warm. They function architecturally as rain and wind shelters, rather than as heat retention facilities. They will generally have initial plant processing facilities such as roasting hearths and parching basins, as well as provisions for temporary storage and drying of crops; to ensure efficient drying, there are generally exterior facilities such as drying platforms, ramadas, racks and so forth. Pollen is likely to occur as dense aggregates dropped from flowers or freshly harvested leaves.

The data from this site are most reasonably interpreted as relating to warm-weather agricultural facilities. Stone-lined basins may have served as receptacles for insect repellent smudge fires or coals used in seed parching. Unburned basins may have been processing tables or bins. Exterior wing-walls would have provided good facilities for drying of cultivated and gathered foods, while also supporting ramadas which provided protection from sun and rain. Roofs probably served as d platforms. Pollen occurs as aggregates. In summar indications suggest that PL 30A was a field house

Figure 3-21. Side/corner notched projectile points from Site PL 30A (reproduced at full size).

Other aspects of field houses have been noted in be studied areas (Raish n.d.); foremost among these distinct trend toward low representation of bow particular and of decorated wares in general. abundance of different vessel classes at this site ca be assessed from Warren's analysis, but field notes to mention recovery of corrugated sherds much commonly than they report the finding of decor sherds. If utility vessels were indeed much more mon than decorated vessels, then the ceramic assemb would also suggest that PL 30A was a fieldhouse s

Site PL 32A

Location and Setting

Site PL 32A is located northwest of Placitas, at elevation of 5280 feet (1609 meters). The site is c posed of a small Pueblo IV (Glaze-Yellow and Glaze- periods) structure of two rooms and an attached sto bin, possibly superimposed over a Pueblo II-III lim use locus. The exterior area of the site may contain areas and midden associated with the structure; s exterior associations may have been damaged b historic irrigation ditch (recorded elsewhere as Site 31A) which crossed the site.

The site is located on the foot of an alluvial fan wh drains the northwestern slope of a low, north-trend ridge. Immediately to the west of the site is the flo plain of Las Huertas Creek; Site PL 30A lies about meters to the north. The site was experiencing alluv colluvial, and probably aeolian deposition of coa sands, pebbles, and cobbles at the time of excavati Steep alluvial fans typically display frequent shiftin their ill-defined, braided drainages, so the site may have experienced one or more erosional episodes in past. Eroding drainages bounded the site on its no and south margins.

Vegetation present on or near the site included shru and bushes (narrow-leaf yucca, Mormon tea, snakewe rabbitbrush) growing over a fairly sparse grass und story dominated by gramas. Few trees grow in t vicinity of the site; those present are all junipers. Fo more detailed description of the vegetation found on t ridges above the site to the east and on the alluvial fl downslope to the west, see the vegetation synopses these settings presented in the discussion of PL 30 above.

Table 3-4. Formal Tool Listing for PL 30A (from notes).

Unit/Strat	Core	Biface	Projectile point	Mano	Metate	Ground stone	Chopper	Hammer-stone	Scraper
1 A		1	2	1					
6 A	1								
8 A							1		
11 B	1 (called "core/hammerstone")								
13 B	1								
24 B			1						
35 A	1								
41 A	1								
44 A	1						1		
49 A		1							
61 A					1				
61 B			1						
62 B								2	
62 C								1	
66 A				1				1	
70 B			1						
71 B	1 ("core/chopper")								
72 BO			1						
73 C					1				
73 D			1						
76 B	2								
79 BI					2				
80 A					1				
80 B	1					1		1	1
85 A	1								
89 BO								1	
93 A			1						

Notes: 1. Units with no artifacts not reported. 2. BO = Level B, outside; AI = Level A, inside, etc.

Testing and Excavation Methods

Site PL 32A was recognized as a Pueblo IV sherd and lithic scatter probably having an associated room block. The site was defined for excavation as centering on the rubble mound (Figs. 3-22A and 3-22B). A point lying about ten meters south and 15 to 20 meters east of the mound's apparent center was selected as datum and arbitrarily defined as the location 100 meters North, 100 meters East (100N/100E), and 100 meters elevation. The site was gridded along the true major compass points into four by four meters (16 square meters) units using a transit and metric tape. Elevations were shot for each of these points using transit and stadia. Locations and elevations for excavated units and their contents were later determined from the nearest points of the four meters grid using standard tape and line level techniques. Limits of the site for purposes of treatment were defined as the perimeter of the square having vertices at 128N/72E, 128N/100E, 94N/100E, and 94N/72E. In all, 896 square meters of area (less two small eroded areas which were excluded) were thus defined as lying within the excavation boundaries.

The site area was stratified into sectors for selection of excavation units using a concentric ring-sector stratification scheme. The rubble mound stratum (which extended over about 50 square meters) was to be totally excavated. Stratum 1 was that area surrounding the rubble mound but lying within the square bounded by the lines 104N, 116N, 76E, and 88E (94 square meters total area). It was to be sampled by random selection of one by one meters units at the 20 percent level (19 units total). To ensure coverage of all portions of the stratum, it was substratified into four quadrants; each of these was to be sampled at equal intensity. Stratum 2 was that area outside Stratum 1, but lying within the lines

100N, 120N, 72E, and 92E (256 square meters). It was to be sampled at just less than ten percent intensity (24 square meters) with six sample units being randomly drawn from each of four equal-area quadrants. Stratum 3 lay outside Stratum 2; it excluded the flood plain to the west of the line at 72N and also the two small, eroded drainages to the south and northeast of the site. It included about 390 square meters of area and was to be sampled at the five percent level (19 units), drawn equally from three quadrants lying on the south, east, and north perimeters of the site.

Actual excavation followed these guidelines with minor exceptions (Map 3-4). Random numbers were drawn without replacement until the appropriate sampling level was achieved for each stratum or substratum. Most selected units were actually excavated. The room block and immediate perimeter (within one meter of the structure) was found to contain only about 29 square meters of area, every unit of which was excavated to some degree. Twenty-one units that were originally thought to lie within the structure proved to lie outside it. These were added to Stratum 1, which ultimately contained 115 square meters area. Within Stratum 1 as redefined, 21 units were excavated to some degree (18 percent), of which 18 units were randomly selected (16 percent). Twenty-one Stratum 2 units were excavated in whole or in part (eight percent), of which 19 (seven percent) were randomly drawn. Deviations from the planned strategy in Stratum 2 resulted from the withdrawal of units selected from the northwest area after it was determined to have been disturbed. Nineteen units (five percent) were excavated to some degree in the area of Stratum 3, of which 16 were randomly selected percent). In total, 9.7 percent of the site was excav it is thought that all of the structural area was d

As was done at PL 30A, each excavation unit assigned an arbitrary unit number according t sequence of excavation. These numbers were rec in a field log for ready cross-reference with thei coordinates, which were assigned according to the dinates of each unit's southwest corner. Numbers 1 to 92 were fully assigned. All numbered units wit possible exception of Units 91 and 92 were dug. Re are available for all but these two units, which wer last two units to be numbered.

Excavations at the site were carried out, using sh and trowels, in natural stratigraphic levels subdi as necessary into 20 centimeters arbitrary levels (from the structure) or ten centimeters levels (with near the structure). Where arbitrary levels were their closing contours were chosen to conform in s and dip to the surface terrain or to the most rec encountered stratigraphic contact.

Strata/level forms were completed for all levels or st dug; these specified the location, contents, and ope and closing depths of the level or stratum described fill was screened through 1/8 inch mesh; all arti and paleobiological specimens encountered were lected. Artifacts and specimens were promptly lo into a field specimen book; field specimen numbers assigned sequentially by log order. When features defined in the course of excavation, feature forms completed; these served as in-field summaries of

Figure 3-22a. Site area of PL 32A viewed from the east. The structure rubble mound is under the tree in the middle distance.

Figure 3-22b. Site PL 32A; the structure, after excavation, viewed from the east.

units containing a feature and of the nature and extent of the feature. Stratigraphic and feature plans and profiles were recorded as appropriate. Ongoing work and exposed details of soil and architecture were routinely photographed in monochrome and in color. Samples of soil were collected for floatation and pollen analysis as indicated.

Excavators at this site routinely carried out subfloor tests into sterile strata. Some features were sectioned to allow examination of their construction sequence, but walls were not routinely dismantled or sectioned.

Site Elements

The site was found to contain a single structure (Feature 1) having two definite rooms and an attached small room or storage cist (Feature 12). In the area away from the site, several locations proved to contain sparse midden deposits, but no formal midden was ever discovered. Of the features not closely associated with the structure, all but one were definitely or potentially associated with a historic irrigation ditch (Feature 4) (Fig. 3-23), to its construction spoil piles, and/or to related overflow clay lenses (Feature 3) and burned lenses representing possible clean-out deposits (Feature 2). The ditch (Fig. 3-24) proved to be part of Site PL 31A; it ran almost true north-south, passing within about 2.5 meters of the western edge of the structure. It is likely that the ditch and its associated dikes and spill aprons disturbed the entire western third of the site.

One exterior feature was probably associated with the prehistoric structure at the site. This was an intact plainware bird effigy vessel (Feature 5; Fig 3-25). It was found inverted at a base depth of 32 centimeters in Unit 34 (103N/89E).

The structure had numerous associated features. These included at least three-pot drop sherd concentrations (Features 6, 7 and 8), an area of floor paved with adobe and ground stone fragments (Feature 9), and three lined rectangular hearths, bins, or ash dumps with associated copings (Features 10, 11 and 13). The structure itself was fairly well preserved; it consisted of an original room (Room 2), a room added later (Room 1), and an interconnected small room or cist (Feature 12). A formal doorway was found between the cist and Room 2. Another may have connected the rooms. The former doorway may have been sealed. The sills of both doorways were made from used metates. Exterior entrance to the rooms may have been through doors or through roof hatches. Extensive roof fall and wall fall deposits were found; these included burned beam fragments. Only one floor was present.

Subfloor cultural deposits and the incorporation of worn ground stone items into the structure's walls suggest that a previous occupation was present at or near the site. The age of this earlier occupation is not known, but a Pueblo II component may have been represented; this observation is based only on an in-field ceramic identification (by A. H. Warren, the project ceramicist), which was recorded in field notes.

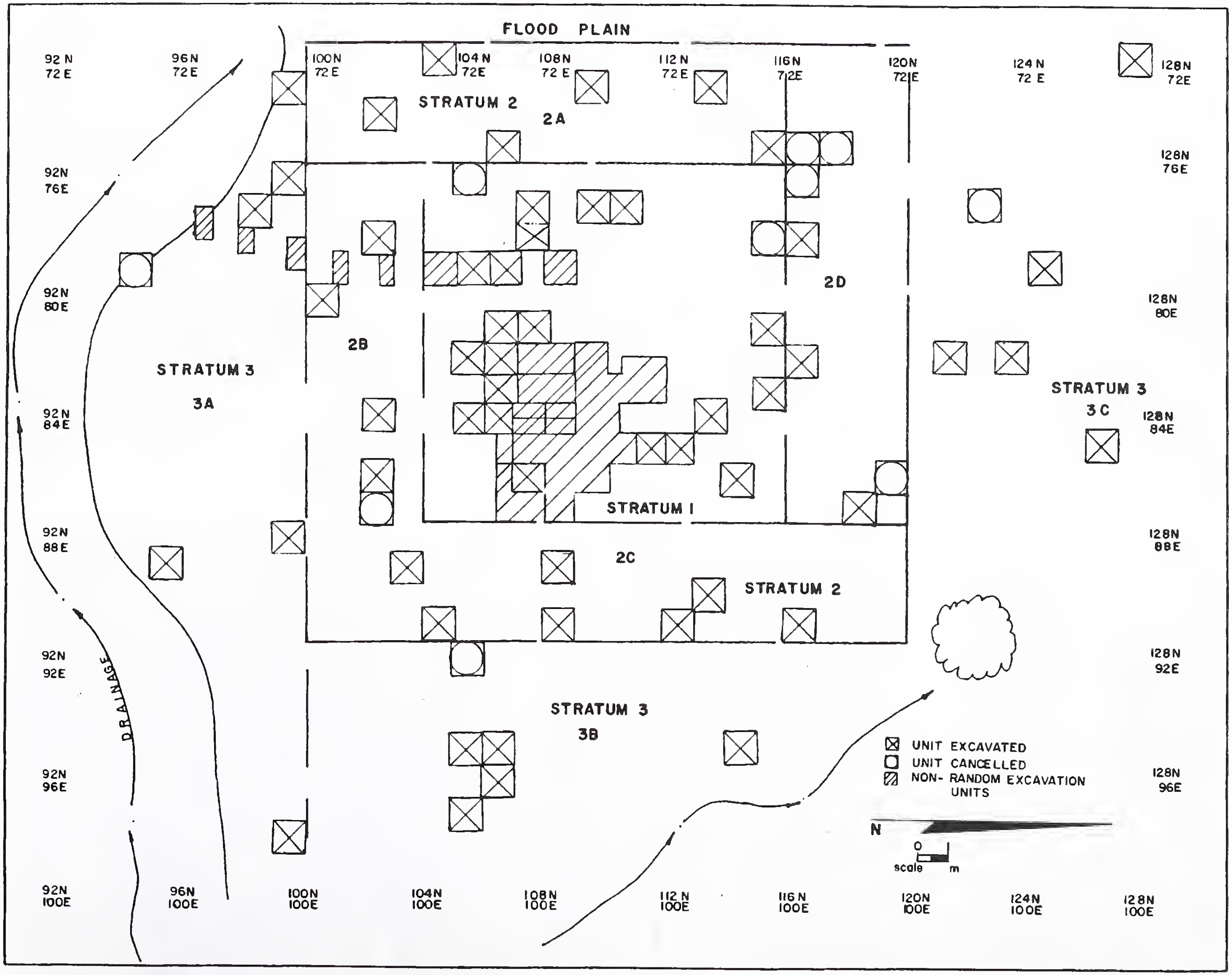
In order to portray the PL 32A structure more clearly within context, the stratigraphy and character of those portions of the site not directly associated with the structure will be described first. Then the structural associations will be characterized.

The General Site Area (Non-structural)

Of the 92 units partly or completely excavated at PL 32A, 63 units were located more than one meter from the exterior walls of the Feature 1 structure. Of these, at least 13 were excavated in locations which were probably or certainly impacted by the Feature 4 ditch and its associated disturbances. The remaining units had fairly uniform stratigraphy, indicating alluvial and colluvial deposition on a relatively high-energy alluvial fan.

The surface stratum was rarely more than a few centimeters in depth; it was composed of loose, fine sand and organic detritus. It lay over a massive deposit of braided fine-to-coarse sands, sandy loams, and gravels which extended to the full depth of excavation in most units. The finer matrix of this deposit was described as light tan, light reddish-tan, light reddish-brown or light yellow-brown in color, and as consisting of intermixed fine and coarse sands or sandy loams. All exterior units encountered this stratum. In most units, pebbles and gravel along with occasional cobbles were found as lesser components mixed into the finer matrix.

Coarse gravel and cobble deposits were encountered at depths of 10 to 40 centimeters below surface in many units, within a rough triangle with vertices at 114N/72E, 105N/96E, and 117N/92E. It appears that a high-energy fan deposit filling an old runoff channel may lie in this area; if so, then the channel probably passes under or just to the north of the structure. Within the eastern margin of the triangle, at 113N/90E, a red-brown compact soil, which may underlie and predate the cobble/gravel runoff event, was encountered. Two units outside the southern margin of the triangle, at 109N/73E and at 105N/79E, contained a lower stratum of sorted, coarse sand and fine, gray sand respectively; these may represent the lower energy deposits to be expected at the margins and the foot of the old runoff channel. Caliche was found in the deepest exterior excavations just outside Feature 12.



Map 3-4. Sampling strata and grid units of Site PL 32A.

Lying entirely within the red/brown/tan/yellow sand and gravel deposit was Feature 4, interpreted as a historic irrigation ditch. This feature was linear, and was oriented north-south for most of its length; it seems to have turned toward the south-southwest near the southern end of its traced length. It was apparently encountered in all units between 96N/77E and 108N/79E. It consisted of a hard, thin, compact layer, about four centimeters thick and 50 centimeters wide, of water-laid silt and clay with associated charcoal, ash, and a few prehistoric artifacts. It lay at depths of 10 to 20 centimeters below surface along that portion of its course which was successfully traced. Feature 3, an anomalous clay and gravel lens found at 115N/79E, quite possibly is a remnant of Feature 4 or a spill deposit from it.

Feature 2, a concentration of ash, charcoal and burned rock found mainly at 20 to 30 centimeters depth in Unit 4 (99N/73E) may be the remnants of cleanup and weed-burning deposits from ditch maintenance. Burned plant parts, which included not only native juniper seeds, ricegrass, dropseed grass and cheno-am (weed) fragments, but also parts from the recently-introduced Russian thistle, were recovered by floatation from this feature (Toll, this volume). A prehistoric component may also be represented; a chalcedony core and several flakes seem to have been associated with the charcoal and burned rock of the feature.

Feature 5 was a plainware bird effigy or "boot" vessel. No description of the pot is available; based on photographs, it had a relatively wide, everted rim, no evident texturing on the surface, and two tiny lugs or "wings" placed on either side of the midline (Fig. 3-25A). Its dimensions were measured in the field as 12 centimeters (length) by 7 centimeters (width) by 6 centimeters (height). If these dimensions are correctly interpreted, then the orifice would have been about 5.5 centimeters in interior diameter. It was found in Unit 34 (103N/89E), lying inverted within the ubiquitous stratum of sand and gravel encountered across the site (Fig. 3-25B). It was oriented east-west with the "tail" to the west. No clear stratigraphic break was recorded at or near the base level of the pot. A mano fragment and two pieces of chipped stone may have been associated.

Pollen samples taken from the pot were identified by Scott (this volume) as containing yucca and cholla; aggregates of low-spine composite pollen and both aggregates and an anther fragment of a cheno-am were also found in the sample. Scott interpreted her results as most likely indicating the normal pollen background of the site at or just after abandonment. A floatation sample from the pot's fill yielded only juniper twigs (Toll, this volume).

No artifact tabulations are available for this site. Based on the field specimen log, it appears that at least a hundred pieces of debitage (of unknown materials), four cores, over fifty sherds, three hammerstones, a cobble scraper, a tested cobble, five pieces of ground stone, a mano fragment and a possible pot cover were collected from the surface and subsurface of the non-structural area. About equal numbers came from the structural area. These numbers are probably quite low; they were inferred by assuming (1) that a plural log entry meant that exactly two items were recovered, but that a singular entry meant that exactly one item was found; and (2) that items other than debitage, sherds, or non-specific ground stone would have been entered in the specimen log with a more exact field identification (e.g.,

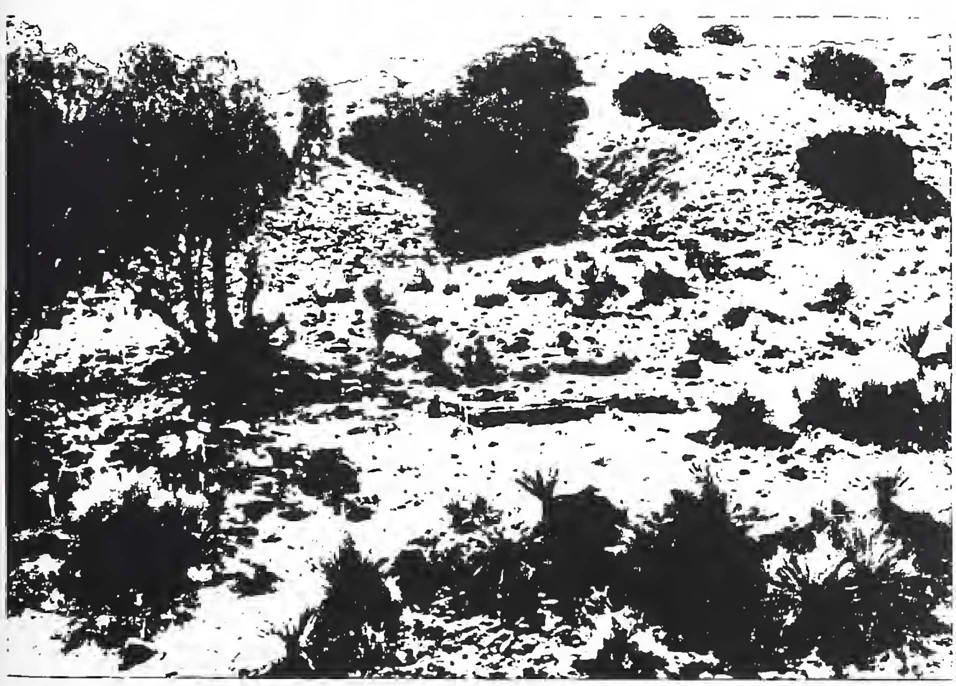


Figure 3-23. Site PL 32A's Feature 4, an historic irrigation ditch cutting near the edge of the structure rubble mound.

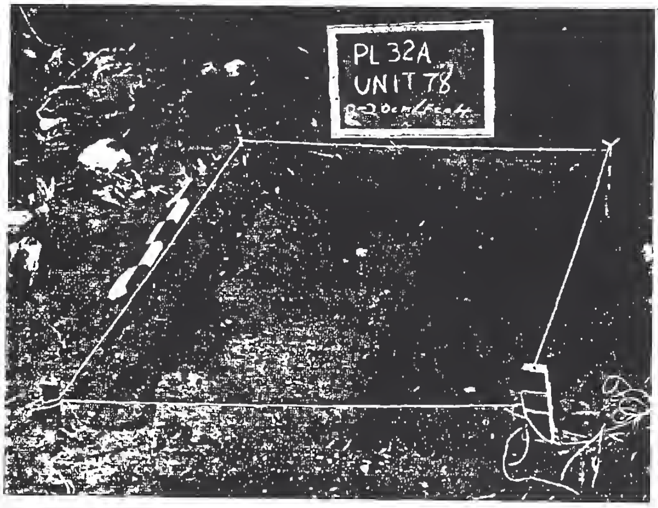


Figure 3-24. An historic ditch segment (Feature 4) in Unit 78 of Site PL 32A.

mano, core, etc.) rather than as generic ground stone or lithics.

Warren's analysis (Warren and Warren, this volume) identified 18 sherds that had been excavated or collected from the non-structural areas of PL 32A. These included pieces from an Espinoso Glaze-Polychrome bowl, from unidentified glaze-on-red bowls and jars, from an unspecified glaze-on-yellow bowl, from unspecified glaze-on-pink jars, and from several Rio Grande Gray plain utility jars (micaceous and non-micaceous varieties). All types described could date roughly from the middle 14th through the late 15th centuries, with most consistent dates around A.D. 1425. The Espinoso type would be the latest diagnostic form, dated by Warren (1979c) to the period A.D. 1425 to 1500.

All the exterior area's ceramics described specifically by Warren were found in or quite near the general area thought to have been disturbed by the Feature 4 ditch (Units 16, 17, 18, 21), or else were found in an area lying about two to four meters north of the structure (Units 26, 27, 31, 32, 64). Owing to the lack of information regarding Warren's approach to sampling of sherds for full analysis, no certain significance can be ascribed to this observation. It would seem likely that Warren selected typical items from either the most meaningful or the richest contexts for her detailed assessment of temper, paste and type. It is unlikely that she analyzed sherds representing the youngest or oldest ceramics on the site, as no black-on-white pottery was described; it is also unlikely that the jar/bowl ratio for Warren's sample reflects the relative abundance of vessel forms on PL 32A.

No bone samples were found in the exterior area site. Pollen and floatation analyses for exterio samples included only those from Features 2 ε reported above (Scott, this volume; Toll, this vo No exterior area charcoal samples were found tha suitable for radiocarbon analysis. Two obsidian sa (from surface collection and from Unit 3, 0 to 2 cei ters depth) produced dates averaging 1375 B.C. A other obsidian dates from this project, these valu probably too old by a factor of three to four or mor to surface-exposure heating and other factors.

In summary, the data from the extramural areas site do not indicate the presence of prepared surfaces, rich midden deposits, or culturally mean stratigraphic contacts marked by erosional surfa soil horizons. Rather, they suggest that the sit subject to essentially uniform colluvial and al deposition and mixing processes during and aft occupation. Later activities by historic farmers have further obscured extramural patterns in the ern site area; the ceramics and other artifacts fro area of the Feature 4 ditch may even be water-t ported intrusives.

The Feature 1 Room Block

The Feature 1 room block was recognized as a struc mound before excavation of PL 32A began. As desc above, the apparent area lying within two to three m of the point 110N/82E was set aside as Stratum (slated for full excavation, to begin after sample un the exterior areas had clarified the occupational depositional sequences represented within the site Sample excavations in Stratum 1 (Unit 30: 107N/ revealed that a room block was indeed present, and it probably extended farther upslope to the east had been anticipated. Eventually, it was demonst that the area north and west of the point 110N/82E not within the room block as originally supposed room block actually lay entirely within the southeas quadrant of Stratum 1. The northwestern and wes portions of the rubble mound appear to have Feature 4 spoil.

Excavation Sequence and Approach

Excavation of the room block at PL 32A required opening of 17 units covering the structure proper additional 12 units lying within one to two meters o structure were also opened. As at PL 30A, the excava sequence began by exploring the apparent wall outli Once these were defined, most effort was shifted to excavation of the better-exposed Room 1. Excavat in Room 2 and Feature 12 followed.

The roomblock at PL 32A was excavated, sampled, and recorded in a manner similar to the structure excavation at PL 30A, already described. Differences in approach included systematic subfloor testing and limited subwall testing. In field notes, strata were referred to as "levels" and were identified by content and probable significance rather than by order of encounter; thus, "Level 2" (= stratum 2: adobe with ash, etc.) regularly was reported to lie both above and below "Level 3" (= stratum 3: red-brown coarse sandy soil with frequent pebbles and cobbles). It should be emphasized that level does not refer to depth below surface in the records of intramural excavations at this site. The following discussion of the room block will preserve this convention in order to avoid confusion for those who may wish to consult original notes and photographs; the reader should always understand level when "depth" is discussed and stratum when the word "level" is used.

Figure 3-25a. The bird effigy vessel from Site PL 32A.

Construction Sequence and Character

As was done in description of the structure at PL 30A, the construction sequence and architectural relations data from this site will be presented first; only then will individual rooms, levels, and features be discussed in detail (Fig. 3-26; Map 3-5).

Definite exterior surfaces were not consistently found in the eastern portion of the structural area. What appeared to be an exterior use-surface was found to lie about 25 to 40 centimeters below present ground surface near Room 2, but at no more than 10 to 30 centimeters below surface at the east end of Feature 12. This surface was composed of pinkish-red bentonitic clay, probably imported from a Santa Fe Formation outcrop on the ridge to the east (Warren, PL 32A excavation field notes for Unit 55); it may represent wall melt, exterior paving, or both. It was often found immediately atop Level 3 (defined as a tan, red, or brown sandy soil with quantities of gravel, pebble, and cobble inclusions); it also occurred within Level 3, portions of which may have been redeposited over the clay layer. Another surface was encountered outside Feature 12, at about 60 to 80 centimeters depth below ground surface, within or at the bottom of Level 3 (Fig. 3-27). This deeper surface of clay with associated snail shells may pertain to initial occupation of the site by the structure's builders, or it may be the product of an older occupation of the site, possibly dating between Pueblo II and early Pueblo IV times. It directly underlay the floor in Feature 12 and seems also to have been encountered at and beneath the base of the south and east walls of Room 2. It seems likely that the deeper surface was buried by the continuing fan wash which deposited Level 3, and that the upper surface of Level 3 was the ground surface at the time of construction of Room 2 and Feature 12. This interpretation is assumed in the following discussion; it is also assumed that only one older occupation was encountered.

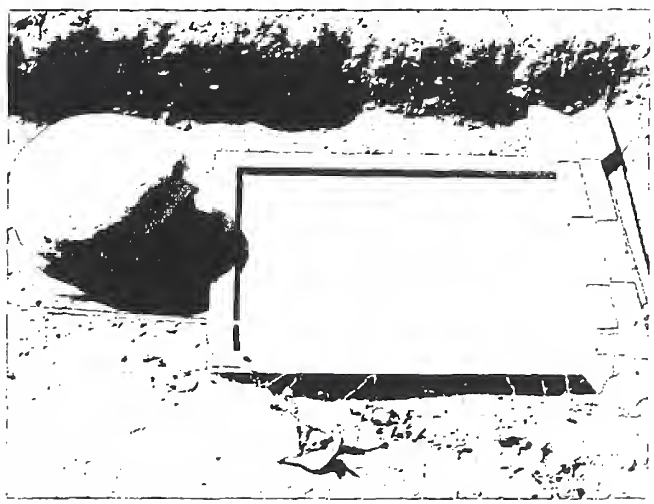


Figure 3-25b. Feature 5, Unit 34, of Site PL 32A.

Feature 12 was a tiny room, or more probably a storage cist, which opened through a porthole or doorway into the east side of Room 2. Feature 12 and Room 2 were constructed as partially subterranean structures, either deliberately or as a consequence of being built into a sloping alluvial fan. It would appear that shallow (up to 50 centimeters depth) pits were dug eastward into the Level 3 fan deposits, and perhaps wall footing trenches were dug around the pit base perimeters. Walls were then laid directly into the trenches. Walls of the cist and room were then built up, in one construction episode, of large and medium cobbles (20 to 30 centimeters maximum dimension) laid horizontally and mortared with adobe.

The exterior parts of footing trenches were then backfilled with Level 3 soil, and the walls courses were built upward for at least a meter, lining the building pit and protruding from it. The space between the building pit wall and the masonry walls, if any, was backfilled with the pit spoil. Ground stone, perhaps from an earlier occupation of the site, was incorporated into the doorway between the room and cist; a metate was used as the door sill. A puddled pink to pale-brown adobe floor about four centimeters thick (Level 8) was laid on a previously-leveled sandy subfloor fill about five centimeters thick (Level 9) in Room 2; the Level 8 floor of Feature 12 was laid directly on cultural substrate soil (Level 10) on the grade of the metate door sill (i.e., at an elevation about 24 centimeters higher than the floor of Room 2).

Room 2 may originally have been built with an exterior doorway on the west side. At some later date, Room 1 was added on the downslope side of the structure, appended to the west side of Room 2 and interconnected by this doorway, which alternatively may have been opened into Room 2 at this time. Room 1 was constructed atop the ubiquitous tan-red-brown gravelly sand Level 3 stratum by digging a shallow trench (estimated in Unit 60 to have been 18 centimeters deep) for wall footings; perhaps the area within the trenched room perimeter was dug out as well. As Room 1 lay downslope from the semisubterranean Room 2, it is likely that little leveling excavation was required.

The Room 1 walls were built up of horizontal cobble courses over a lower course of upright cobbles, using adobe mortar to bed the rounded building elements but using local Level 3 soil to backfill the footing trench. The floor of Room 1 was laid in the same manner, of similar material, on the same yellow sand subfloor, and at the same level as the Room 2 floor. No evidence of reflooring work was found, but the similarity of the floors in the two rooms may indicate that Room 2 was completely re[...] when Room 1 was built; alternatively, it is also p[...] that Room 2 had no floor prior to Room 1 constr[...] or else that the two floors were simply prepared a[...] in the same way with the same materials.

Because its walls were shallowly buried and [...] collapsed, it is unclear whether Room 1 ever [...] exterior door; several finds of thin, worked san[...] slab fragments within possible roof fall suggest t[...] two to three room structure may have been e[...] through roof smoke hole hatches. Details of ro[...] struction were not often recovered, but remain[...] least four badly burned *vigas* were encountere[...] scribed and sampled for radiocarbon dating. S[...] these *vigas* may have spanned a ramada or porch [...] north side of Room 1, rather than the structur[...] (Fig. 3-28).

Latillas of unidentified wood were found in Room [...] 88, near the west wall of the room; although b[...] these measured from 2.0 to 2.5 centimeters in dia[...] Burned twigs associated with the *latillas* probabl[...] incorporated into roof plaster, as they seem to hav[...] at PL 30A. Grass may also have been used as part [...] roofing material.

At some date after its construction, the doorw[...] hatchway leading from Room 2 into Feature 12 [...] least partially walled up. Occupation seems to [...] continued after this construction episode, as a low [...] hearth or milling area (Feature 11) was construct[...] and in the Room 2 floor and against the east wall of [...] 2 directly in front of the doorway. Two other [...] features having the same general plan as Featu[...] were built along the south wall of Room 2 (Featu[...] and in the northeast corner of Room 1 (Feature 10). [...] were filled with ash and may have been used as he[...] Remains of what may have been a fourth such fe[...] (Feature 9) were found built on and embedded [...] floor in the southwest corner of Room 1.

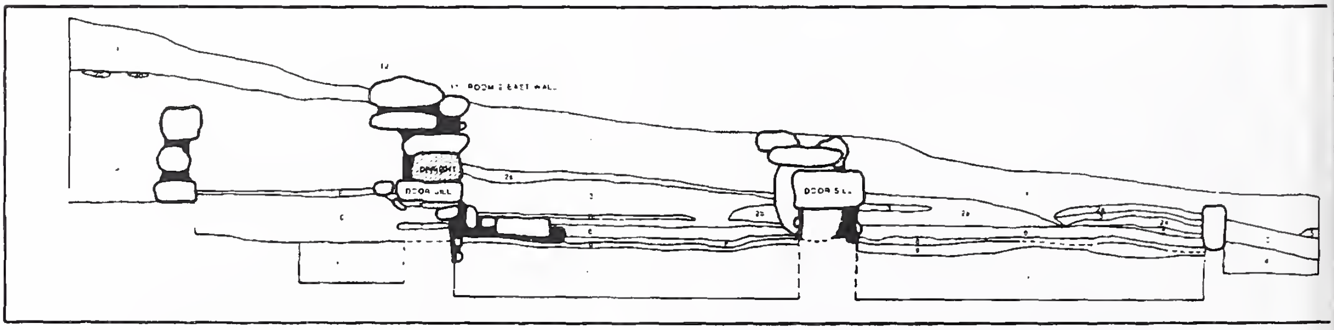


Figure 3-26. Site PL 32A, cross section of the structure. One inch equals one meter; the Key is on page 141.

The abandoned structure seems to have collapsed rather slowly. Stratigraphic profiles of room fill show complex interbedding of redeposited Level 3 soils intermixed with ash (Level 5), aeolian/humic sand (Level 4), mixed ash and charcoal (Level 7), and pinkish, pale-brown adobe (Level 2). Level 3 was commonly interbedded with elements of Level 2; these latter units were eventually separated into roof fall (Level 2a) and wall fall (Level 2b). Roof fall generally overlay wall fall; the two sublevels were commonly separated by Level 3, which also occurred below Level 2b. Ash and charcoal were found on the floor and in overlapping strata well up into roof fall (compare Figs. 3-26, 3-29, 3-30A and 30B, and 3-31).

Three or more pots, which had been left on the roof, were found smashed within post-abandonment strata both outside of and inside of Room 1; the three sherd concentrations which resulted were labeled as Features 6, 7 and 8. The Feature 6 scatter seems to have been from a pot left on the roof or on the ground surface against the exterior north wall of Room 1. Features 7 and 8 apparently represent two pots which may have been left on the roof or hanging from the ceiling of Room 1. The Feature 8 sherd scatter was found well up into roof fall deposits. The Feature 7 pot was found at the base of a thick Level 2 lens, so it may also have been left on the Room 1 floor (Fig. 3-32). Apparently, sherds from only two of the three features were studied by Warren (Warren and Warren, this volume), who classified one sherd from Feature 6 and one sherd from Feature 7 as being from locally-made Rio Grande Plain Micaceous Utility jars. As the two scatters were separated by a wall, it is likely that two or more different micaceous utility jars are represented by Features 6 and 7.

These observations suggest that the abandoned structure was flooded repeatedly, introducing Level 3 soils; simultaneously, the roof and walls continued to melt, depositing Level 2 lenses and roof contents. The roof definitely burned, but it may have burned some years after abandonment. It is also possible that more than one roof-burning episode is represented.

PL32A EAST-WEST CROSS-SECTION

1 LIGHT BROWN LOOSE SANDY TOP SOIL
2a LIGHT PINK ADOBE ROOF FALL
2b LIGHT PINK ADOBE WALL FALL
3 REDDISH BROWN COARSE SANDY SOIL, PEBBLES AND COBBLES FREQUENT AT LOWER ELEVATIONS
4 SANDY LOAM WITH AEOLIAN SOILS
5 LIGHT GREY ASH LENS
6 ARBITRARY/MIXED STRATA
7 ASH AND CHARCOAL
8 ADOBE FLOOR LEVEL
9 LIGHT SAND
10 NON-STERILE SUB-FLOOR
11 STERILE SANDY SOIL WITH NUMEROUS PEBBLES AND COBBLES
/ STRATA PERIMETERS
FEATURE COMPONENTS
ADOBE

Key to Figure 3-26.

Descriptions of individual features will now be presented by room in their order of discovery. After features have been described, evidence from samples and artifacts will be summarized and evaluated.

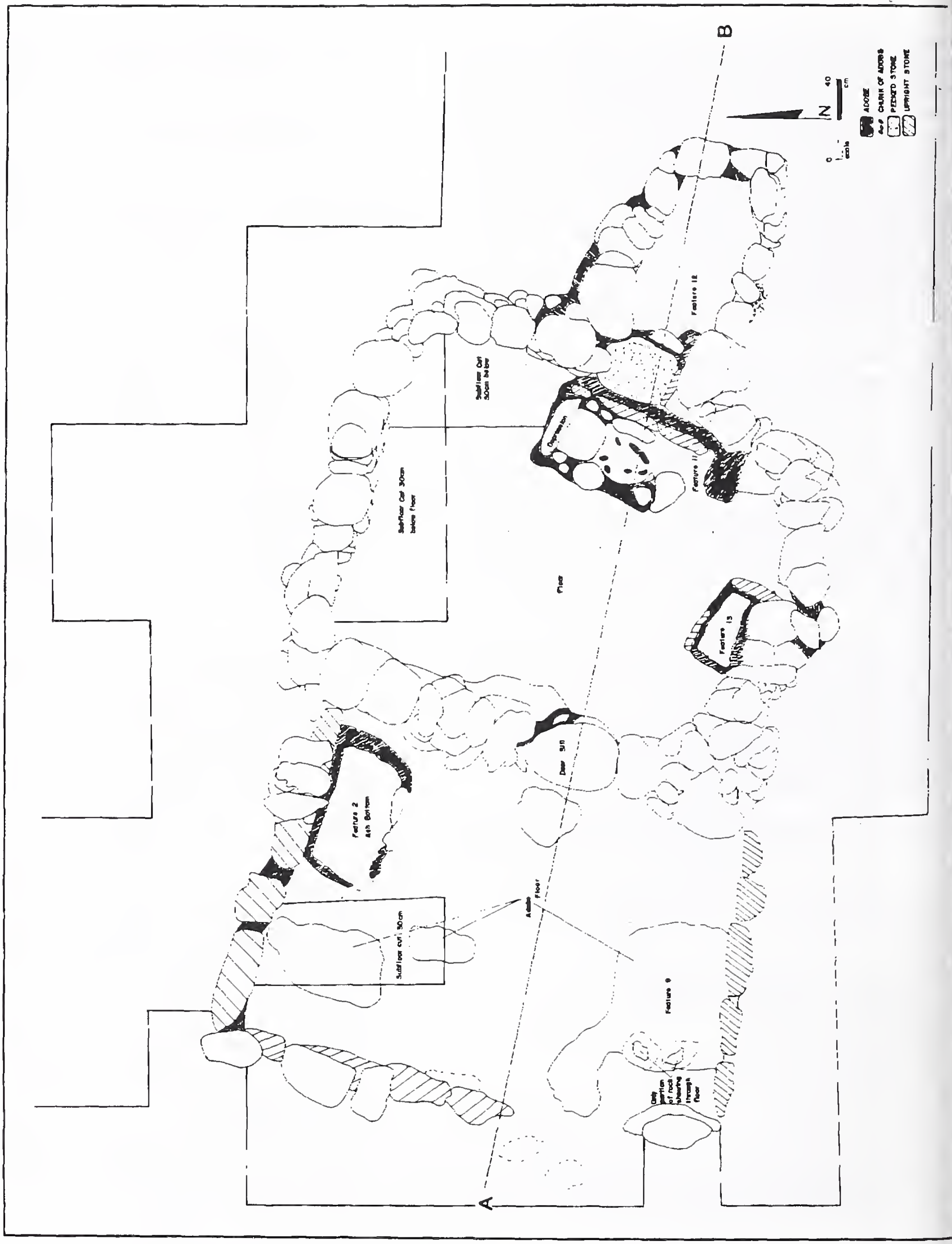
Feature 1: Room 1

The northern room of the structure was slightly trapezoidal in outline; the east end was narrower (2.2 meters inside dimension) and the west end broader (2.4 meters inside dimension). The east wall was built as an external wall of Room 2; the parallel west wall and the north and south walls were built later, when Room 1 was enclosed. The room measured 1.6 meters in interior dimension perpendicular to the east and west walls. As the north and south walls were non-parallel, no definite orientation for the room can be determined, but the approximate long-axis orientation of the overall room block was 105 degrees east of north, i.e., a little north of east-southeast.

Room 1 was recognized prior to excavation as a probable structure, as it was not deeply buried. The western end of its floor was encountered at a depth of no more than 30 centimeters below surface. The northern wall and portions of the western wall were preserved to a height of two or more courses, but only the lowermost course remained of the southern wall and of the bulk of the western wall. Construction of the eastern wall will be described in the discussion of Room 2, below.

The lowermost course for all three walls was constructed of large (typically about 60 by 40 by 15 centimeters) cobbles set on end and chinked with adobe. The upright first course was set into a shallow (20 centimeters depth or less) footing trench excavated into the Level 3 stratum or through Level 3 into the top of Level 4. The footing trench was not obviously lined or prepared; the trench was backfilled with Level 3 soil. A capping adobe plaster may have been deliberately placed over the backfilled trench outside the structure. Where upper courses were preserved, they were composed of cobbles smaller (typically about 40 by 25 by 12 centimeters) than those used in the lowest course; upper-course cobbles were laid horizontally as single-coursed units in abundant adobe mortar. In no case were more than two horizontal courses preserved in place.

Only one floor was found in this room. A subfloor layer of yellow-brown sand was first laid; this deposit (Level 9)



A
B
Feature 12
Feature 11
Feature 15
Feature 2
Ash Bottom
Feature 9
Floor
Door Sill
Adobe Floor
ADOBE
CHUNK OF ADOBE
PECKED STONE
UPRIGHT STONE

was typically about five centimeters thick. A puddled adobe floor was laid over the sand; the floor deposit (Level 8) was poorly preserved but ranged up to four or five centimeters in total thickness. Distinct, intact floor was recognized over about 30 percent of the room area, with the intact portions lying in the northwest, southwest, and east-central areas.

Features 9 and 10 were associated with the Room 1 floor. Feature 9 consisted of two small, thin slabs (17 by 10 by 3 centimeters and 16 by 15 by 3 centimeters) and a large (13 by 13 centimeters), roughly square potsherd plastered into the floor in a north-south line extending from the south wall out into the southwest corner of Room 1 (Fig. 3-33). Floor plaster extended over the edges and across part of the top surfaces of all three items. The floor had been thickened (up to nine centimeters thick) beneath the slabs and sherd; this thick area (and, indeed, Level 8) terminated abruptly just west of the included objects. The paved and perhaps reinforced area may have been part of the apron or coping of a milling locus, basin, or hearth lying just to the west. If so, the central part of the feature had been removed or destroyed; no floor was found west of the line of the three embedded objects. A burrow may have disturbed the area in question.

No data are available at this writing on the typology of the sherd or the presence or absence of grinding on the slabs. No pollen or floatation samples were submitted from Feature 9. This problematic feature cannot presently be interpreted further, but it could represent the remains of a coping surrounding a hearth or basin, such as those described below as Features 10, 11 and 13. Alternately, it may simply be an area of unusually durable and partly paved floor.

Figure 3-27. Feature 12 in Site PL 32A. The lower use-surface is in the foreground.

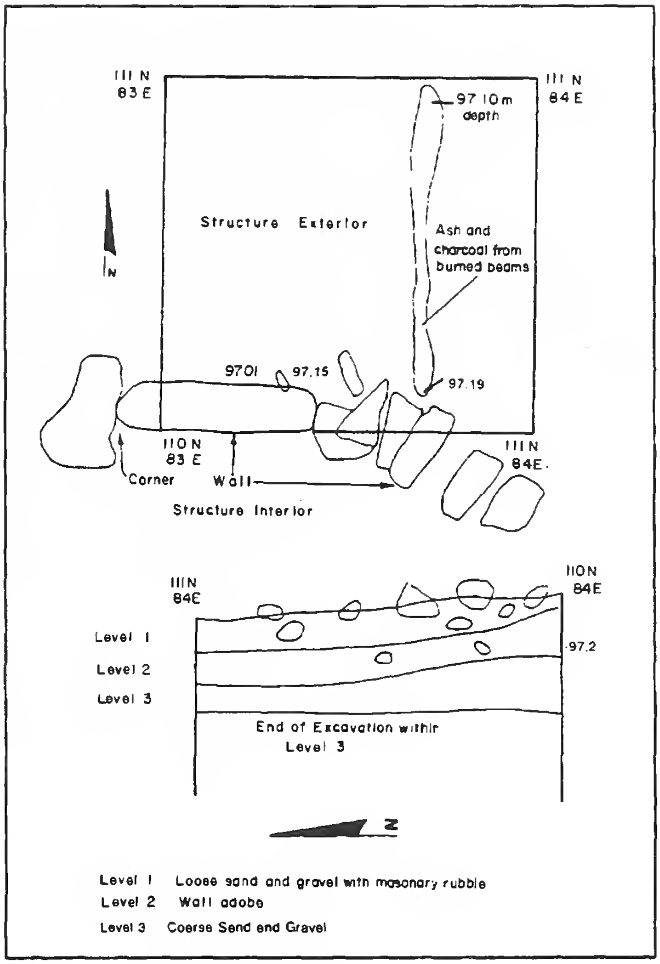


Figure 3-28. A plan and profile of the ramada north of Room 1.

Feature 10 (Figs. 3-34, 3-35 and 3-36) consisted of a basin hearth which was built up from the subfloor of Room 1. The hearth was built against the room's north wall; its east end lay only a few centimeters from the east wall of Room 1. This feature incorporated upright cobbles and copious adobe to form the floor and coping walls of a rectangular basin. Its internal dimensions were about 20 centimeters north-south by 30 centimeters east-west by ten centimeters deep.

This basin was surrounded by a cobble and adobe coping. It was filled both with a layer of ash four centimeters thick, and with several large cobbles which seem to have been placed deliberately and perhaps burned. The large cobbles may have been placed to effect a hurried repair of the missing west coping or to provide heat retention at the hearth's last use.

When the large cobbles were removed, the feature proved to have been built originally as a simple rectangular basin hearth, the south wall coping of which was raised by the addition of a single flat cobble set on edge (Fig. 3-36). The heavy adobe coping was found to continue from the base of the flat cobble all the way around the south, east, and north sides of the basin. On the east and north sides, the coping stood to a height of 18 centimeters above floor level. The basin's west wall was preserved, but the raised coping was either never built along the west side or else it was damaged to the point of being unrecognizable.

The construction adobe for this feature was somewhat pinker in color than the wall adobe to which it was appended; it may have been burned. The pinkish-gray adobe floor was absent in the immediate feature area, but the floor contact level just outside the coping was covered by an ash deposit thought to have eroded from or to have been spilled from the hearth basin.

Feature 1: Room 2

The eastern room of the structure was roughly rectangular in outline, with rounded corners. It was widest (2.05 meters interior dimension) north-south; the length a the east-west axis was considerably less (1.7 me interior dimension). All four walls seem to have l built at one time, and Feature 12 was probably structed at this time as well.

It seems that the presence of Room 2 was not recognized until the excavation of of the rando chosen Unit 30 (107N/86E), which encountered southeast wall of Room 2 and the south wall of Fea 12. The walls of Room 2 proved to be relatively inta 75 centimeters height or more, and the floor was countered at depths of 55 to 75 centimeters below sloping surface of the site.

As was mentioned previously, this room seems to h been constructed before Room 1 was built. Constu tion began by a leveling excavation running east, b into the alluvial fan slope. Walls were probably buil within and against the sides of this excavation, wh seems to have cut into an older cultural stratum (L 10). This stratum appeared sporadically as a charc and ash lens underlying the southern and eastern wa associated were lithics and sherds of Kiatuthlanna B and of a polished black ware (both field identificatio

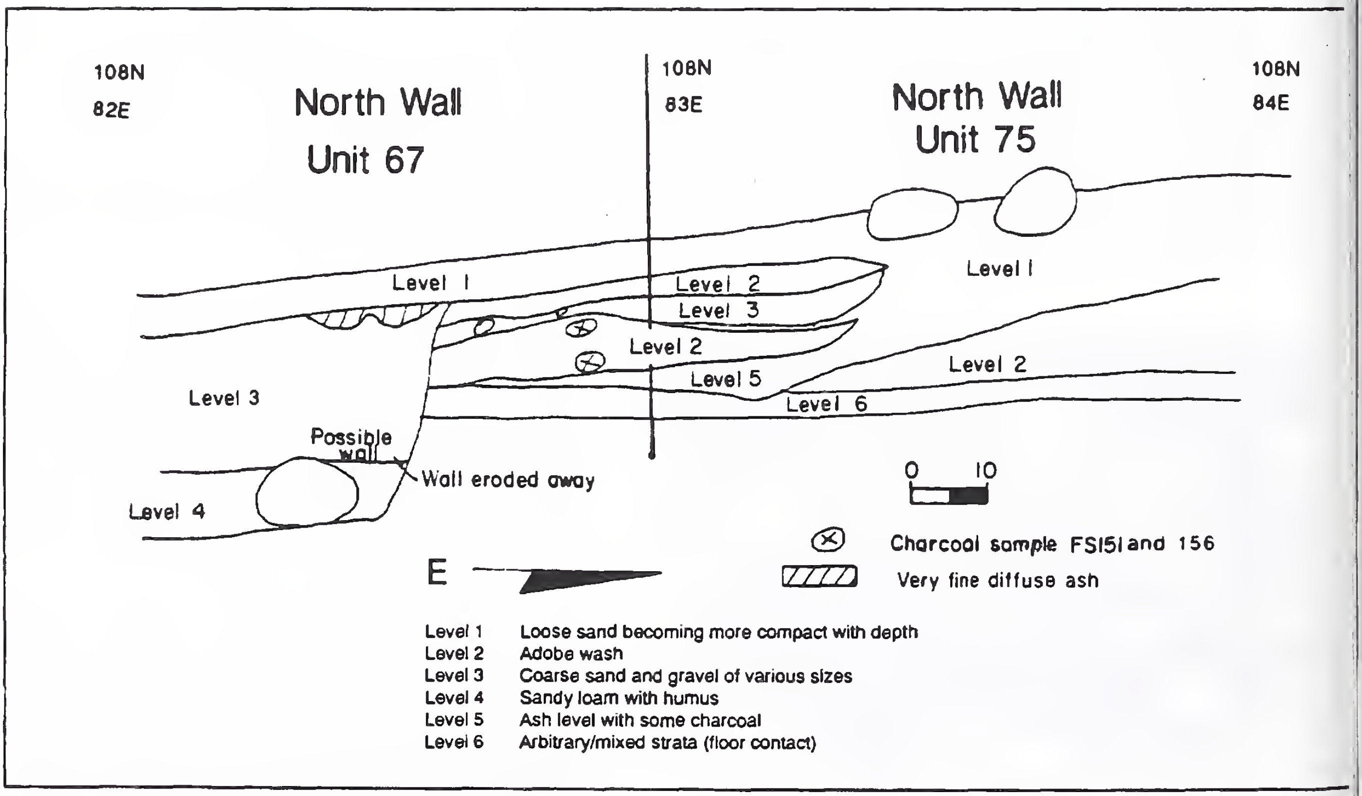


Figure 3-29. Profile of the north wall, Units 67 and 75 of Site PL 32A.

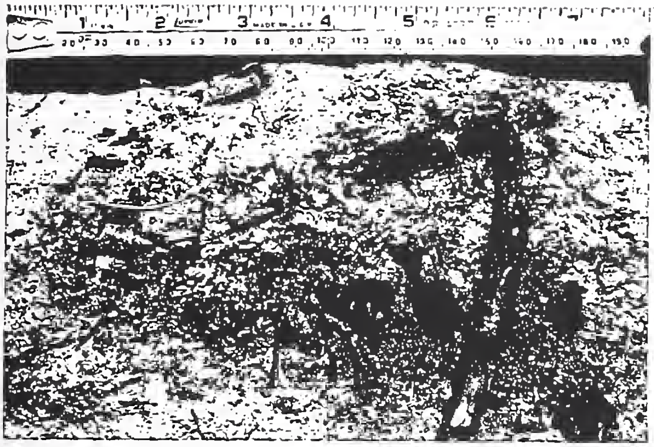


Figure 3-30a. Burned roofing in Site PL 32A. The tape is oriented north-south.

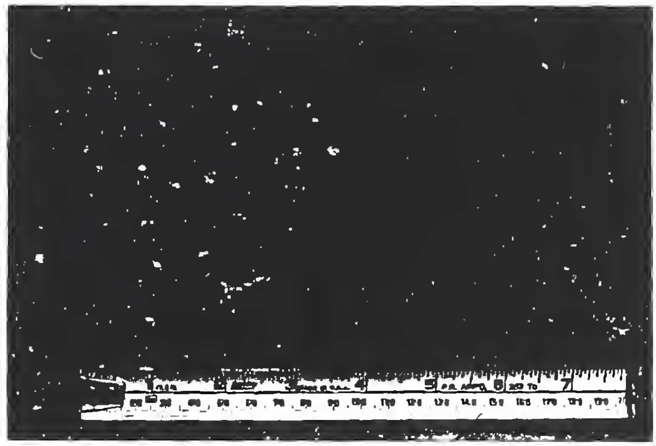


Figure 3-30b. Another sample of burned roofing in Site PL 32A.

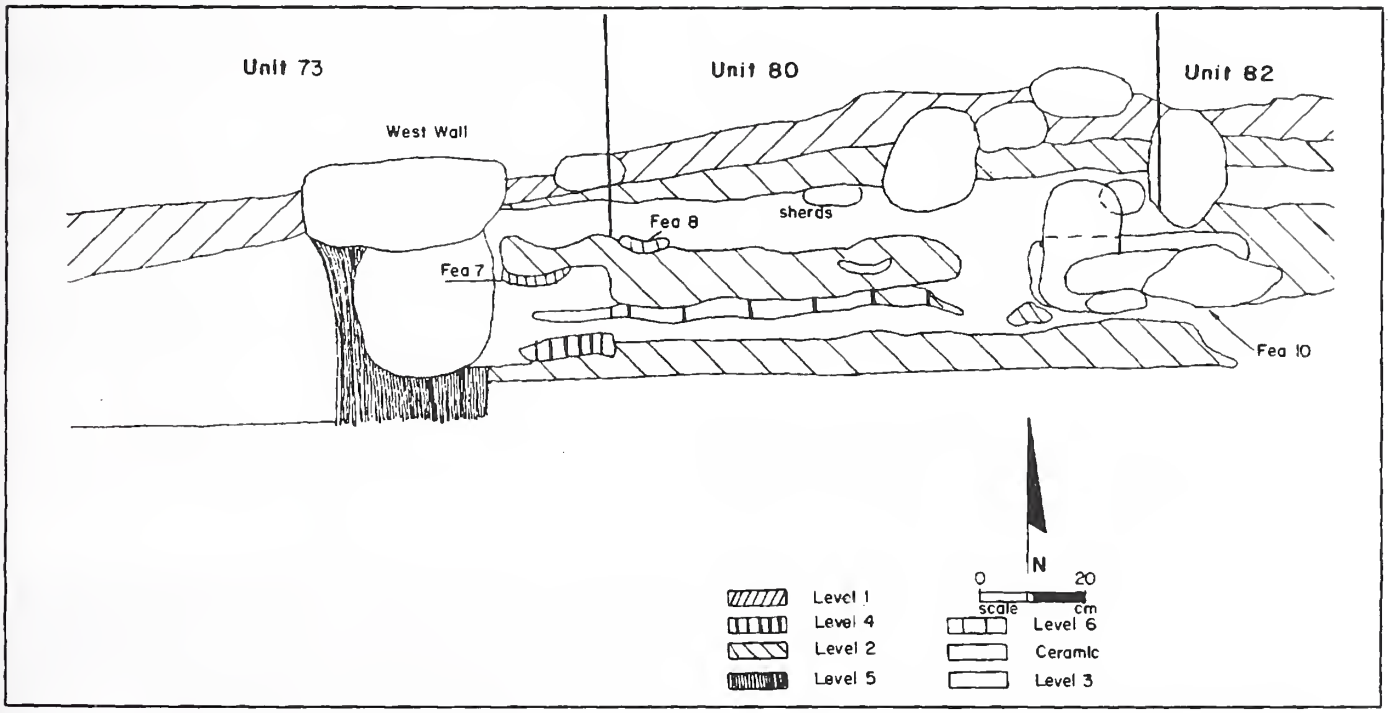


Figure 3-31. Profile of Units 73, 80 and 82 of Site PL 32A at 109.5N.

It was not explored other than in the immediate area of the footings of the walls of Room 2 and Feature 12 (Fig. 3-26). Material from this stratum may have been collected as an admixture with some of the floor samples submitted for pollen and floatation analysis; this possibility is discussed further below.

No adobe footings for the walls were laid; rather, cobbles were laid directly on either the excavated surface or on the subfloor fill sand (Level 9). Unlike Room 1, the Room 2 walls were built up of horizontal courses of medium-large cobbles (about 35 by 25 by 15 centimeters in size) laid in adobe mortar, with no first course of vertical cobbles. No special effort was made to orient flat sides of cobbles to produce a smooth interior wall. Oddly, many wall sections seem to have been made thicker as they rose. The wall excavation was backfilled outside the walls with Level 3 soil, but the interior was not backfilled at all until the yellow-gray Level 9 subfloor sand (typically about five centimeters thick) was laid

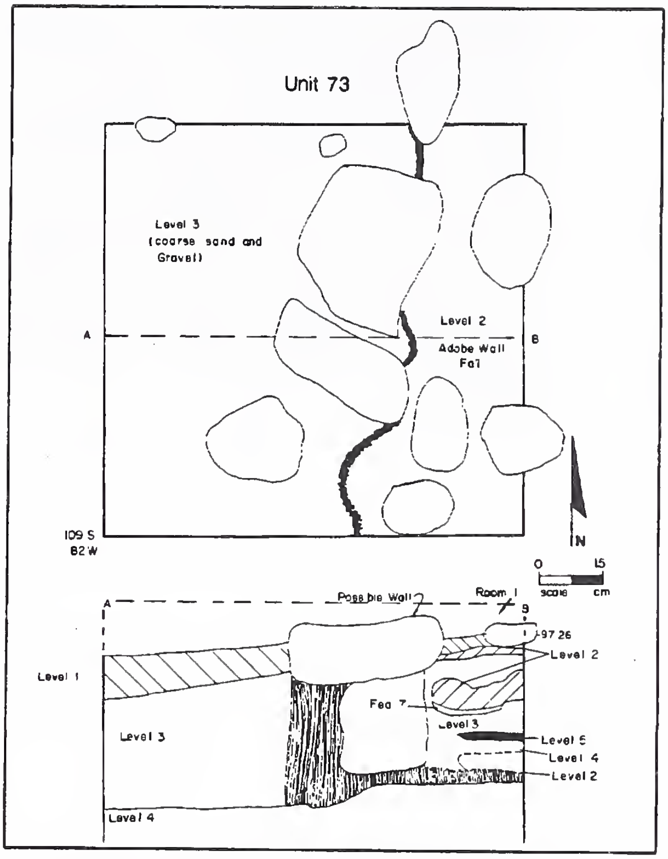


Figure 3-32. Plan and profile of Feature 7 at Site PL 32A.

down. As was mentioned above, Level 9 may have been laid before the walls were built. Interior wall surfaces in this room seem to have retained spots of plaster, but no further details are known.

The puddled floor (Level 8) of the room, made of pink-gray adobe, was laid directly on the subfloor sand; data are unclear, but it appears that the floor was not laid until after the walls were founded. The floor was typically about four centimeters in thickness; it was well-preserved across the entire room.

Two doorways may have been present in the walls of Room 2. The eastern doorway was constructed at the same time as the room and adjoining cist feature which it connected. The east side of the door sill was laid directly on the subfloor, sand which was spread on the lip above the Room 2 floor excavation. The west side of the door sill footing was a built-up masonry facing of the wall of the Room 2 floor pit, which was at that point about 15 centimeters deeper than the Feature 12 subfloor surface. The wall of the pit had been faced with two lower courses of small cobbles, upon which the west side of the sill stone rested.

The sill stone was a worn cobble metate, with its surface oriented parallel to the wall alignment across the doorway); this would suggest that the m was not used in place as a combination grinding and door sill. Probably, the stone was selected for smoothness, and its ability to reinforce an othe unstable pit edge against collapse from wall pres Higher courses of the adjoining wall segments faced with thin slabs of ground stone to frame doorway opening (Figs. 3-37, 3-38 and 3-39; compa Fig. 3-26).

The eastern doorway was later closed partially or pletely. Intact wall deposits which sealed the doo were present when the wall was excavated; these tended upward for 20 centimeters above the met upper surface. The walls on either side of the door extended upward nearly 30 centimeters higher than the doorway fill of small cobbles in adobe mortar. discrepancy may be due to more rapid erosion of flimsier construction of the filling compared to original wall. Alternatively, the doorway may never l been completely blocked.

The western doorway was less well preserved than eastern doorway (Fig. 3-37). It seems to have been m by laying a heavily-pecked and possibly ground co (60 by 60 by 40 centimeters in size) as a doorsill in second course of the wall. No framing stones or maso blocking the doorway remained; the presumption by field crew that a doorway was present was appare

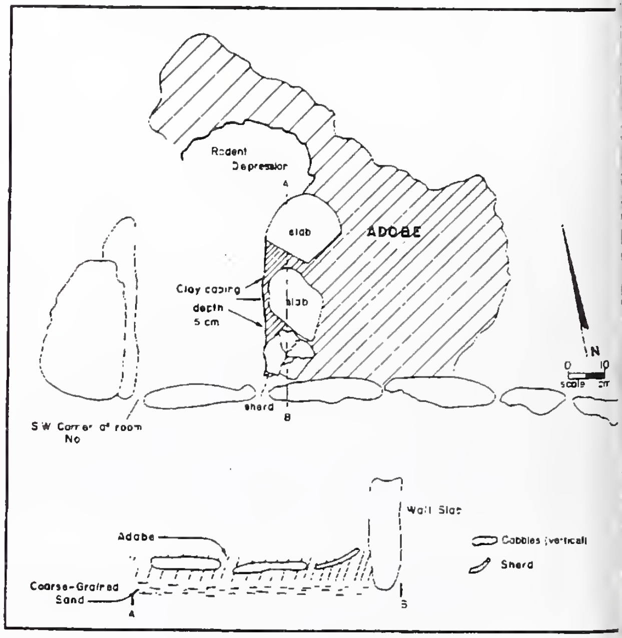


Figure 3-33. Feature 9 of Site PL 32A.

based on (1) the absence of higher courses over the probable sill; (2) the degree of pecked work on the sill stone in contrast to other wall stones, which were unworked; and (3) the height of the sill, which was no more than about five centimeters higher than the definite sill in the eastern doorway.

Two floor features were recognized in Room 2. The first, Feature 11, was built into and against the east wall of Room 2, immediately below the eastern doorway. This feature was a complex construction of flat horizontal and upright slabs and cobbles, joined by heavy adobe plaster into a possible collared hearth or working surface. Its exterior dimensions were about 90 centimeters north-south by 45 centimeters east-west (Fig. 3-38). An ash lens lay along the room wall immediately to the south. A number of chipped stone items, including two cores, were found on the floor near the feature.

Feature 11 was composed of a flat surface about 25 by 30 centimeters in extent, to the south of which was a shallow basin about six centimeters deep, 20 centimeters wide, and 50 centimeters long; the basin was bordered on the east and west by a coping extending from the flat area. The floor of the basin had been damaged (perhaps by erosion) and was not reliably detectable; the basin fill contained only washed deposits mixed with lumps of adobe and localized lenses of ash. The area between the basin and the wall was faced with three flat cobbles stood on edge, one of which had been ground; the three cobbles were plastered into both the feature and the wall.

Several thin slabs or cobbles, and an Espinoso Glaze-Polychrome bowl sherd tempered with Tonque latite, had been embedded deliberately as paving into the flat

Figure 3-34. Feature 10 of Site PL 32A.

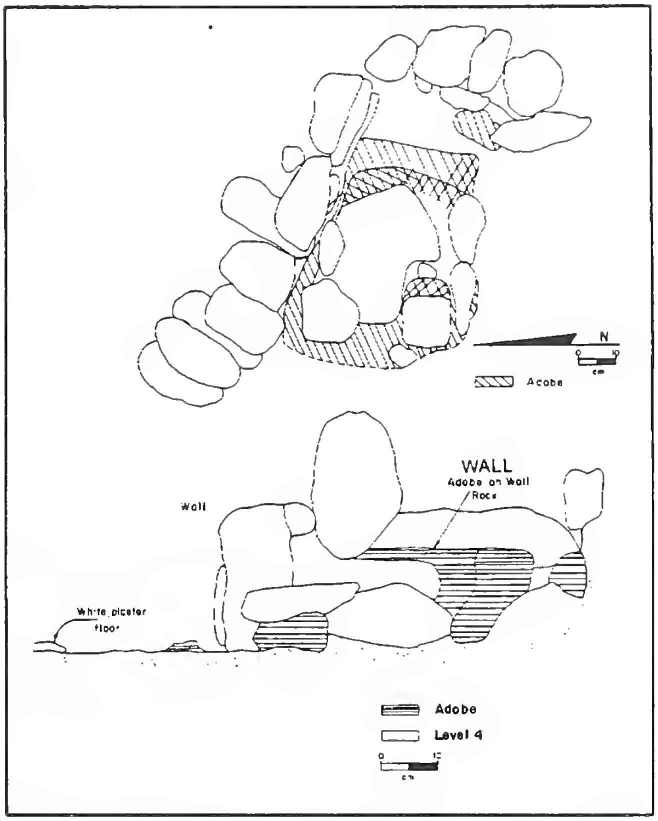


Figure 3-35. Plan and profile of Feature 10, at 109.2N, in Site PL 32A.

northern surface of the collar. Pollen and floatation samples were recovered from the feature's washed fill and from the feature substrate. The substrate samples may pertain not to the feature, but to the earlier cultural deposits upon which and into which Room 2 and the Feature 12 cist were built; the feature fill samples may have been redeposited from or contaminated by fill washed down from the higher floor of Feature 12.

Feature 13 was a slab-lined, shallow, simple rectangular hearth sunk into the subfloor against the south wall of Room 2 (Fig. 3-39). The basin was oriented east-west. It was 40 centimeters long by 22 centimeters wide and extended to a depth of 12 centimeters below the level of the Room 2 floor. It was lined on the east by an upright slab, on the north by a slab and by adobe, and on the south and west sides, and on its floor, by adobe. All adobe within the feature was of the same color and apparent composition as that of the room floor. No notation seems to have been made of whether the adobe appeared to have been burned. No above-floor coping was present in this feature. The fill of the basin was gray ash, within which were found chunks of

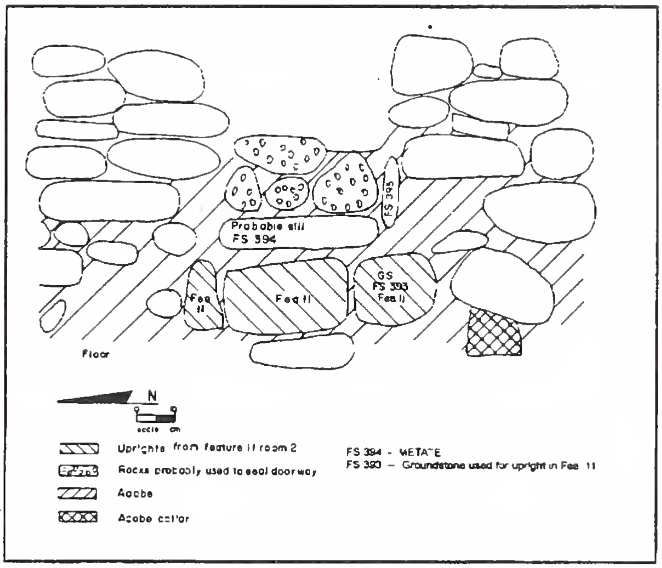


Figure 3-36. The east door of Room 2, Site PL 32A.

charcoal up to 2.5 centimeters in size; eight fragments of burned rock were also found in the fill. Pollen and floatation/charcoal samples were collected; two sherds were found in association.

Feature 12 (Cist Subfeature of Feature 1)

Feature 12, an exterior cist attached to the east wall of Room 2, was enclosed by a curving wall bonded into the Room 2 walls on either side of the interconnecting doorway. The resulting floor plan was U-shaped, with the Room 2 doorway at the top of the U, and with the base of the U extending out from the Room 2 wall toward the east-southeast. The cist was 92 centimeters in greatest interior east-west length, and 48 centimeters in greatest interior north-south width. Walls averaged 10 to 25 centimeters in thickness and may have been thicker nearer the top (Figs. 3-27, 3-40 and 3-41).

At excavation, intact portions of the walls still stood to a height of up to 60 centimeters or more. They were constructed of large and medium cobbles and adobe, which were laid in a manner similar to that of the Room 2 walls into which they were bonded, although the feature walls may have been somewhat less massive. The original height of the Feature 12 walls could not be estimated reliably for two reasons. First, the walls appeared to slope inward, as if they had been laid to form a corbelled dome or conical cylinder. It is also possible that they originally stood vertically. If so, they experienced some slumping as the abandoned site became more deeply buried. True vertical walls would require many more stones per unit height than would walls of a corbelled or bell-shaped structure. Secondly, it was not possible with confidence to distinguish the wall cobbles from cobbles naturally present in the Level 3 slopewash which filled the feature; hence no accurate estimate could be made of the number of cobbles originally present in the walls. No definite roof fall was found in Feature 12, so the nature of the feature's original height and type of roof is unknown.

The walls seem to have been founded directly on subsoil, although the Room 2 wall which formed the western end of the feature was founded on Level 9 sand. A floor of hard, red, puddled adobe about 2.5 centimeters thick was laid on the subsoil so that its surface was level with the top of the metate door sill; the floor seems to have been laid after the wall footings were installed. The wall footings may have been placed in shallow trenches no more than eight centimeters deep. The interior of the completed feature may have been plastered. Excavation of this feature was made difficult by its small interior size and considerable depth, but it was determined that the subsoil base of the walls and floor was in fact an older cultural deposit (Level 10) about 20 cm thick, which overlay the sterile Level 11 soils also encountered in Room 2. Both the floor surface and the Level 10 subsoil were sampled for pollen and floatation. For other details of construction of Feature 12, discussed within the context of Room 2 architecture, please see the sections entitled "Construction Sequence and Character" and "Feature 1: Room 2," above.

Feature 1: Chronology and Samples

Samples were analyzed from most proveniences within Feature 1. These will be discussed in the order they were described above; Room 1 and its associated features and fill will first be considered, to be followed by discussion of Room 2 and its associations, and finally by description of Feature 12 contents.

Macrobotanical samples from Room 1 included materials from fill and from the interior and exterior of Feature 10. Botanical specimens identified in the field as charred yucca fruits were collected from both the feature fill and it associated exterior ash lens. These were examined by Toll (this volume) who concluded that they were corncobs. She also reported burned tickseed and saltbush charcoal from the hearth fill sample; in contrast, she found juniper and other conifer charcoal together with burned ricegrass in the exterior ash sample. Toll apparently found corn at PL 32A only within Feature 10. She also analyzed a sample from mixed wall and roof fall; this sample, collected from a lens high up in the stratigraphic column, contained unburned juniper debris and burned yucca seeds.

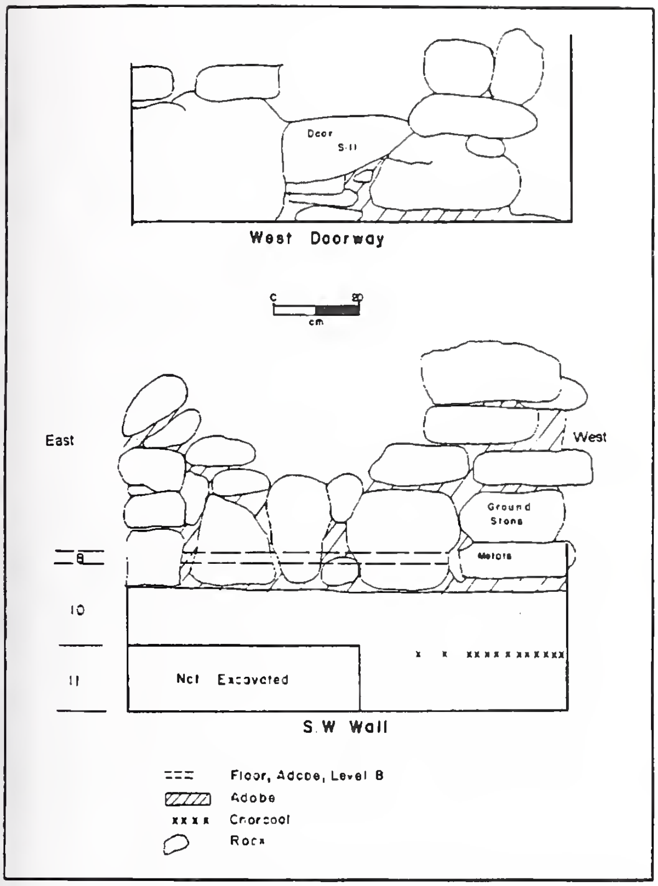


Figure 3-37. The west door of Room 2, Site PL 32A.

Within Room 1, pollen was recovered and analyzed (Scott, this volume) from Feature 10 and from the floor near Feature 10. Samples from the room floor and from within the rock fill (representing perhaps the last use as a heating hearth) of Feature 10 produced no probable economic forms, but a sample from the basal fill (representing perhaps a previous episode of ordinary hearth use) of the feature contained large quantities of spurge pollen together with smaller amounts of globe mallow pollen and a corn anther. Scott noted that both spurge and globe mallow have primary medical significance within southwestern ethnobotanical usage, but declined to advance any further interpretation.

Neither faunal nor radiocarbon samples were submitted from Feature 10. A sherd was found in the feature basin fill, but no identification is available for this artifact. A concentration of Cieneguilla Glaze/white bowl sherds was found in floor context in the southeast corner of Room 1 (Warren and Warren, this volume); this vessel was probably made in the San Felipe area. Just to the north of this specimen and in an equivalent or slightly higher stratum was found a sherd of a San Clemente Glaze-Polychrome bowl, also probably from the San Felipe area. These types would suggest dates in the range of A.D. 1325 to 1425 (Warren 1979c).

Fill deposits of Room I contained three features and produced faunal and radiocarbon samples. These will now be described.

The wall fall, floor fill, and roof fall deposits lying within and just outside of Room 1 contained three sherd concentrations (Features 6, 7, and 8), all three of which were thought to represent abandoned pots broken in the course of decay of the structure. The available data on these features is summarized in the general Feature 1 description, above.

Faunal samples from Room 1 were recovered from Level 6 (possible floor contact) and also from the higher Levels 2 and 3. Both Akins and Bertram (both this volume) analyzed these specimens. Akins concluded that a woodrat forelimb bone, a jackrabbit hind toe bone, a jackrabbit skull fragment, a small mammal or bird shaft fragment, and a burned small rodent tibia fragment were present. When I re-examined the bones, after

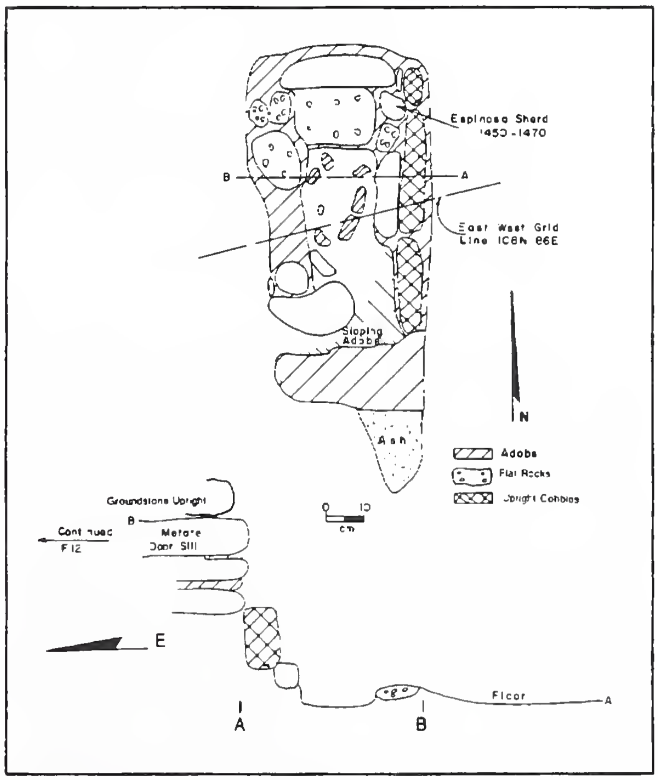


Figure 3-38. Feature 11, Site PL 32A.

Akins' analysis was complete, I agreed with her diagnoses except for two points. I viewed the jackrabbit skull fragment as being better assigned to an unspecified medium rodent and the burned fragment as best referred to an unidentified small form. I now think that Akins' rodent diagnosis was probably correct. None of the bone specimens from Room 1 fill could be ascribed any clear cultural or seasonal significance by either analyst.

A radiocarbon sample was collected from Unit 70, Level 2, from a lens thought to be Room 1 roof fall. It dated to A.D. 1178 (midpoint) or A.D. 1235 (midline best estimator), with 95% confidence intervals for the date of A.D. 1030 and A.D. 1325. This date is too old but not unreasonably so, assuming that it came from heartwood of a large *viga* (Table 3-5).

An obsidian sample was collected from Unit 20, two meters south of Room 1 at a depth thought to be near that of the old construction surface (Table 3-6); it produced a date of A.D. 423, on material thought to be type 3520 (Obsidian Ridge/Rabbit Mountain source). This is the youngest hydration date from this site, but it still seems anomalously old. For reasons discussed previously, this date should perhaps be dismissed until further advances in obsidian hydration dating theory allow compensation for all controlling factors.

A bowl sherd of Cieneguilla Glaze-Polychrome, which Warren (field notes) judged to have been made in the Hagan basin, was collected from very near the obsidian sample just described, and at a slightly higher stratigraphic level. This pottery would date to the period A.D. 1325 to A.D. 1425 (Warren 1979c).

The floor and floor features of Room 2 produced numerous samples. Plant remains (Toll, this volume) included samples from the floor contact stratum and from Features 11 and 13. In the southwest room corner was found copious saltbush charcoal, less juniper charcoal, and charred juniper debris. Material from the southeast room corner, possibly associated with ash related to Feature 11, included carbonized seeds of an unknown grass, and also of goosefoot, of mustard, and of purslane. The Feature 11 basin had poor preservation, but unburned goosefoot seeds were found in each of two samples; one of these may have come from the earlier occupation stratum under Room 2 and Feature 12. Feature 13 contained charred juniper mast and ricegrass; forms represented by charcoal from this feature were dominated by saltbush, with lesser amounts of juniper, and rare sage and rabbitbrush.

Pollen analysis from Room 2 floor and feature contexts (Scott, this volume) included study of samples from inside the adobe collar of Feature 11, a sample taken

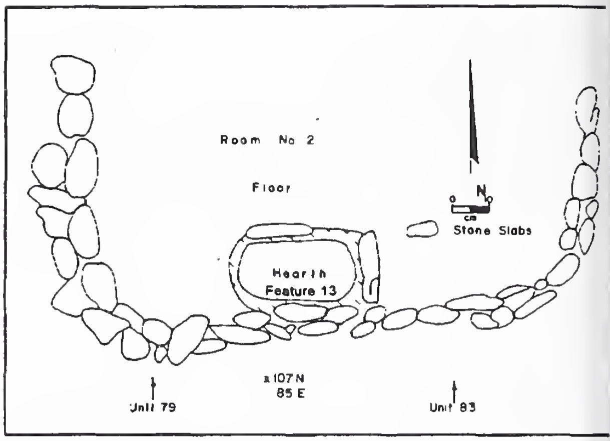


Figure 3-39. Feature 13 at Site PL 32A.

from beneath the surface of one of the feature slabs, a sample taken from the lower fill of the basin. The co sample yielded corn pollen. It also contained pollen fr the local weeds and shrubs (sage, goosefoot-pigwe saltbush and low-spine composites) which Sc considered ambient (i.e., not necessarily cultural). sample from beneath the slab was very similar. The sample, which may be from the pre-construction (op air) occupation, lacked corn but had purslane po along with the ambient forms. A single sample from fill of Feature 13 contained abundant cheno-am po and some corn pollen. Given the abundance of saltb charcoal in the feature (unknown to Scott), it is lil that most of the cheno-am pollen is from this speci

Quantities of potsherds were recovered from Room including some from floor context. Of the floor-ass ated specimens, there was an Espinoso sherd embed in Feature 11 and a Rio Grande Plain Gray utility sh in Unit 85. Both sherds were tempered with mater suggesting manufacture in the Tonque (LA 240) are

No radiocarbon or obsidian dates were obtained floor-contact specimens from Room 2. No bone recovered from Room 2.

Macrobotanical specimens from a roof fall level in Ro 2 were identified in the field as burned cactus spin Toll (this volume) determined that they were actu carbonized grass stems; perhaps they were stored or under the roof or incorporated as straw in the roof its

Neither pollen nor obsidian samples from the fill of Ro 2 were analyzed.

Ceramic specimens analyzed by Warren included unidentified glaze-on-pink jar sherd from roof fall, Rio Grande Plain Gray jar sherd from Level 3 an similar one from roof fall, and other sherds which ca

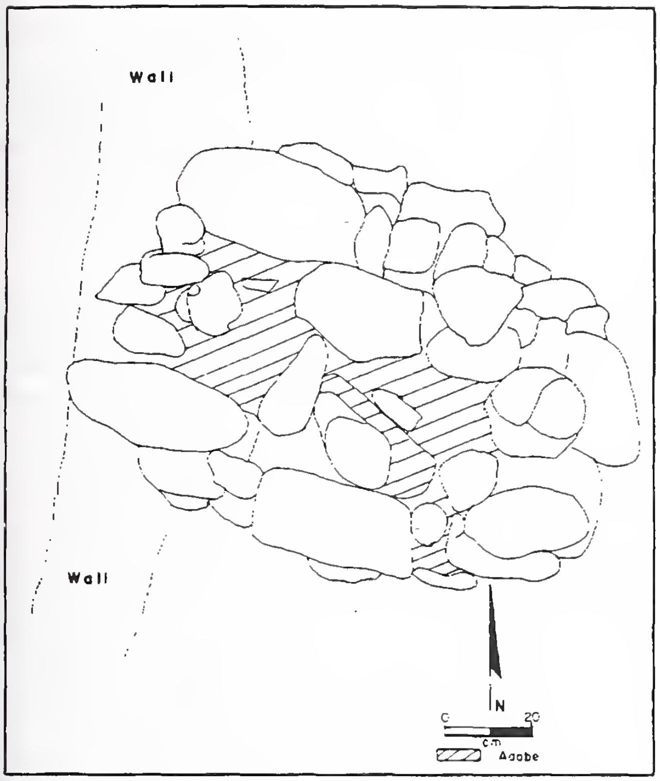


Figure 3-40. Feature 12, an exterior cist of Site PL 32A.

from the surface layer of the fill. The sherds from roof fall were both probably made in the Tonque area; the other utility sherd may have been made in the Bernalillo area near Kuaua (LA 187). The sherds from higher strata include decorated and utility wares made in the Kuaua and Tonque areas, sherds possibly made locally, and sherds made in the San Felipe area. The implied inference of local manufacture was supported by Warren's recognition of a *puki* (pot mold) lining fragment, still used today in the production of puebloan pottery in molds. Some of the pottery found at PL 32A may therefore have been made on the site.

Of the six radiocarbon dates from this site, four came from roof fall within Room 2 and one came from the fill of Feature 13 (Table 3-5). The hearth fill date is problematical; it gave a calibrated midline best estimate date of A.D. 650 and a midpoint date of A.D. 733, with 95% confidence limits of A.D. 600 (maximum) and A.D. 865 (minimum). Three other dates from Room 2 have midline best estimates of A.D. 1060, A.D. 1330, and A.D. 1370. Three best-estimate dates are possible for the fourth sample: A.D. 1060, A.D. 1100, and A.D. 1160. The corresponding midpoint dates are, respectively, A.D. 1075, A.D. 1335, A.D. 1350, and three possible dates of A.D. 1082, A.D. 1100, and A.D. 1125. The multiple possible dates for the fourth sample are due to the non-monotonicity of the radiocarbon curve; all are about equally credible, a priori.

The seventh to eighth century date is puzzling. Even allowing for the effects of old-wood burning and for the effects of dating a mixture of juniper and saltbush charcoal (with their different C-14 fixation rates) does not account for this date being so early. Even if one assumes that the earlier occupation of the site was actually sampled (implying that the stratigraphy of Feature 13 was misconstrued), the date is too old even for a Kiatuthlanna B/w association, such as the one described in previous sections for PL 30A.

The later dates seem generally consistent. The late eleventh century date or dates may be from a robbed beam. The fourteenth century dates, which are only a little more than a half-century older than the best-estimate ceramic assemblage date of A.D. 1425, would seem to fit expectations if one assumed that inner rings of medium to large beams were dated.

Samples that were fully studied from the Feature 12 cist included only pollen, macrobotanical specimens, and a single sherd. No bone, radiocarbon, or obsidian samples were found.

The only fully-analyzed sherd was a Rio Grande Plain Gray Utility jar fragment of possible local manufacture found at 40 to 60 centimeters below surface just outside the wall of Feature 12 (Unit 55: 108N/87E). It is not known whether the sherd was found in the construction backfill or in the lower Level 3 deposits. Mention is made in the field notes and/or sample logs of Kiatuthlanna B/w sherds, "Cortez" pottery (sic), and a "historic" polished black sherd associated with the subfloor cultural stratum which lay beneath Feature 12 and Room 2, but no further data are available at this writing.

Figure 3-41. The south wall bond of Feature 12, Site PL 32A.

No plant remains were found in floatation samples from the floor of Feature 12, but a subfloor sample produced charred goosefoot and charcoal dominated by juniper (Toll, this volume). This last sample probably pertains to the earlier occupation of the site.

Three pollen samples from Feature 12 floor and another three from "floor and subfloor fill" were analyzed by Scott (this volume). She found no large concentrations of pollen or pollen aggregates, but she reported that five of the six samples contained corn pollen. Her report indicates that globe mallow, purslane, crucifer (mustard/cabbage family), and cholla pollen were found in both floor and subfloor samples. Cheno-am pollen was more common on the floor than under it; Scott suggests that storage of cheno-ams in particular may be implied for Feature 12, although the pollen frequencies were not particularly high.

This observation is interesting, given that charred goosefoot (a cheno-am) was found under, but not on, the Feature 12 floor. It is noteworthy that Scott's pollen results from Feature 12 closely mirror Toll's macrobotanical results from Feature 11 and the associated loci along the east side of Room 2. The observed similarity may be coincidence, but it may also reflect alluvial washing of plant fragments from Feature 12 into Room 2; perhaps this is why Toll found no goosefoot on the Feature 12 floor.

Lithic artifacts from Feature 1 which were described in the field adequately enough to allow their inclusion in this report were limited to the few items discussed above in the feature descriptions. For example, available data do not indicate that any typologically distinctive projectile points were found in Feature 1. It is known that near-floor deposits in Rooms 1 and 2 and in Feature 12 contained lithic artifacts, including flakes, but no further data are available at this writing. For lithic analysis of the PL 32A assemblage, please refer to Bertram's report (this volume).

Interpretations

PL 32A had most of the characteristics of small farmstead sites, characteristics which were lacking in Site PL 30A. Both rooms at PL 32A had definite hearths of a type common in larger and undoubtedly permanent pueblos. A formal storage structure was present. Probable nonthermal processing features, which used up much of the floor space at PL 30A, were rarer at PL 32A; this may suggest that floor space was at a premium for indoor winter activities and for sleeping.

A wider variety of plants were used for fuel, perhaps indicating depletion of nearby deadwood stocks due to over-exploitation by year-round occupants. Comm stored foods, especially corn and purslane, were pr ably present as stored items at PL 32A; only corn definitely stored at PL 30A. Pollen aggregates were at PL 32A but common at PL 30A, perhaps indica greater floor disturbance and more frequent cleanin the PL 32A residents, as would be expected in a y round occupation.

Rich midden deposits were not found at PL 32A, but may only reflect ongoing alluviation and hence buried nature of the site. PL 30A, by contrast, was deeply buried; midden deposits should have been tected had they been present. The lithic data availa are scanty, but they appear to suggest that ground st pieces were fairly common in PL 32A, in spite of absence of samples from rich exterior midden; simila the limited data from ceramic analysis suggests tha wider variety of vessel forms may have been recove from PL 32A in spite of poor visibility. All of th observations would indicate that PL 32A conforms r sonably well with the expectations for a farmstead s

Most indications, then, seem to suggest that occupat of PL 30A was more seasonal than was occupation of 32A. In the absence of good comparative data an strong typology of site functions for sites on the San slopes, it is reasonable to conclude that PL 32A may h been a year-round farmstead, while PL 30A was m probably a fieldhouse.

Site PL 38A

Location and Setting

Site PL 38A is located northwest of Placitas, at elevation of 5310 feet (1618 meters). The site is co posed of a surface scatter of lithics, fire-cracked ro and possibly-ground stone. A possible rock alignme which was associated with a Bajada point, an early middle Archaic type, proved to be a rock outcrop. small, surficial ash stain was located and excavated.

The site is set on the crest and gentle slope of an uplift fault pediment or bench made up of Santa Fe gravels a cobbles. The site overlooks Las Huertas Creek, t valley bottom of which is about 12 meters lower than t site. The Rio Grande flows about 2.7 kilometers to t west.

Local vegetation included junipers, yucca, snakewee various grasses, and Mormon tea. On the valley flo grow junipers, rabbitbrush, and grasses.

Table 3-5. Site PL 32A Radiocarbon Dates.

University of Texas No.	Material	Forest Service No.	Unit No.	Level or Feature	Libby Radiocarbon age - years BP	Error (years)	Dates In Years AD: 95% Older limit	Mid-point date[1]	Mid-line age[2]	95% Younger limit
4913	floor hearth fill	36179/83		Fea. 13[3]	1310	50	600	733	650	865
4911	beam	287	79	2 (Rm.2, SW)	940	50	920	1075	1060	1230
4909	beam	281	85	2B/3 (Rm.2)	920	70	930	1082	1060	1235
—	—	-	—	—— or[4]	-	-	965	1100	1100	1235
—	—	-	—	—— or[5]	-	-	1015	1125	1160	1235
4908	roof wood?	151	70	2 (Rm.1)	820	120	1030	1178	1235	1325
4910	beam	261	79	2 (Rm.2, SW)	620	60	1265	1335	1330	1405
4912	beam		82	2 (Rm.2, SW)	580	60	1285	1350	1370	1415

Notes: 1. Arithmetic means of older & younger limits. 2. Theoretical value at zero uncertainty level (see text).
3. Could be a sample from lower cultural layer (unlikely), or from Feature 13 (likely).
4. Second possible date due to secular variation. 5. Third possible date due to secular variation.

Table 3-6. Site PL 32A Obsidian Hydration Data.

Forest Service No.	Unit No.	Level	Material[1]	Microns of Rind[2]	Age BP (3500)[3]	Age BP (3520/25)[4]	Age BP (3530)[5]	Age BP (3510)[6]
17	surface	-	3520	6.3	5894	3788	3300	1924
18	3	0-20	3500	4.8	3914	2198	1915	1117
47	20	20-40	3520	4.0	2353	1512	1317	768
57	24	20-30	3520	4.7	3247	2087	1818	1060
304	87	0-10	3520	4.2	2592	1666	1451	846
338	61	20-40	3525	5.2	3974	2554	2224	1297

Notes: 1. As visually sourced following Warren. 2. As measured by UCLA Hydration Laboratory.
3. Assumed material type 3500 (Cerro del Medio?). 4. Assumed material type 3520/25 (Obsidian Ridge).
5. Assumed material type 3530 (Polvadera). 6. Assumed material type 3510 (Grants) (unlikely).

Testing And Excavation Methods

The site was selected for excavation because a Bajada projectile point (Fig. 3-42) was found on it in association with fire-cracked rock and a possible rock alignment. The site was thought to have potential as an early-to-middle Archaic structural site; had this been the case, this site would have been extremely significant, as such sites are almost unknown. The site's surface was collected on survey.

The site was stratified for excavation into three distinct sampling strata (Map 3-6). Stratum 1 was defined as an area of 32 square meters centering on a burned rock scatter which was called Feature 2. Stratum 2 was defined as an area of 96 square meters lying to the southeast of Stratum 1; it was a low-density lithic scatter. Stratum 3 was defined as the area surrounding the apparent rock alignment, which was labeled Feature 1.

The site was gridded into four by four meters grids along the cardinal axes, using transit and tape. A point lying 13 meters south and 8 meters east of the apparent center of Feature 1 was chosen as datum, and assigned the coordinates 100 meters north, 100 meters east (100N/100E) and 100 meters elevation. Units were randomly selected from each stratum; a total of six units in Stratum 1, five units in Stratum 2, and three units in Stratum 3 were chosen for initial excavation.

Excavation proceeded using the same methods and procedures as have been described above for sites PL 30A and PL 32A. Arbitrary levels of ten centimeters thickness were to be dug until natural strata were defined. All spoil was screened through 1/8" mesh. The 14 selected units were dug. An additional unit was excavated to the south of Stratum 2 to allow examination of an ash stain (Feature 3) discovered in the course of the work.

Site Elements

Excavation at PL 38A revealed that the suspected cobble alignment was a rock outcrop. Within the three units opened in Stratum 3, a few items of debitage and one piece of possible ground stone were recovered. In Stratum 1, three of the six units opened encountered lithics (apparently no more than one or two items per unit) and one unit recovered burned rocks. All five units in Stratum 2 were sterile.

Substrates in Stratum 3 were cobble ledge or lag deposits, which lay at depths of a few centimeters in Units 13 and 14 to 20 centimeters in Unit 12. In Stratum 2 and beneath the Feature 3 ash lens, a calichified soil was encountered at about ten centimeters depth. In Stratum 1, caliche underlay the eroded surface soil at a similar depth.

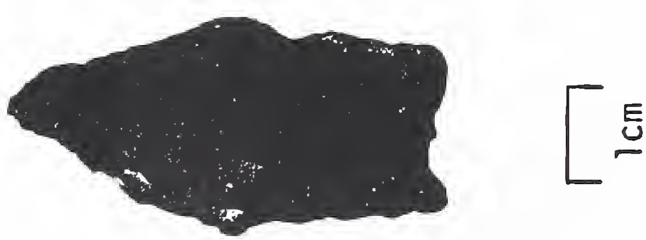


Figure 3-42. A Bajada point found on the surface at Site PL 38A. Its length is about 4.5 centimeters.

As Features 1 and 2 had proven to be natural a surficial, respectively, it was decided to excavate a nc random unit (Unit 15) to explore an ash stain, which w labeled Feature 3. This stain proved to be about 0.9 1.2 meters, but it had no depth, bottoming out at abc ten centimeters on caliche. Due to its shallowness, samples were collected from the ash stain.

Artifacts and Analysis

As only stone artifacts were found at this site, little c be said in the absence of the lithic analysis, which w unavailable at this writing (Bertram, this volume). Tl problem was complicated by apparent conflicts betwe the field records, field specimen log and artifact phot graphs. The log indicates that only field specim numbers 1 through 12 were assigned, and that the were assigned to collections typically amounting to o or two items. The excavation forms are in gener agreement with the log. However, the artifact phot graphs indicate that as many as 58 items were collect from the site; these are thought to have been mostly entirely from the survey collections.

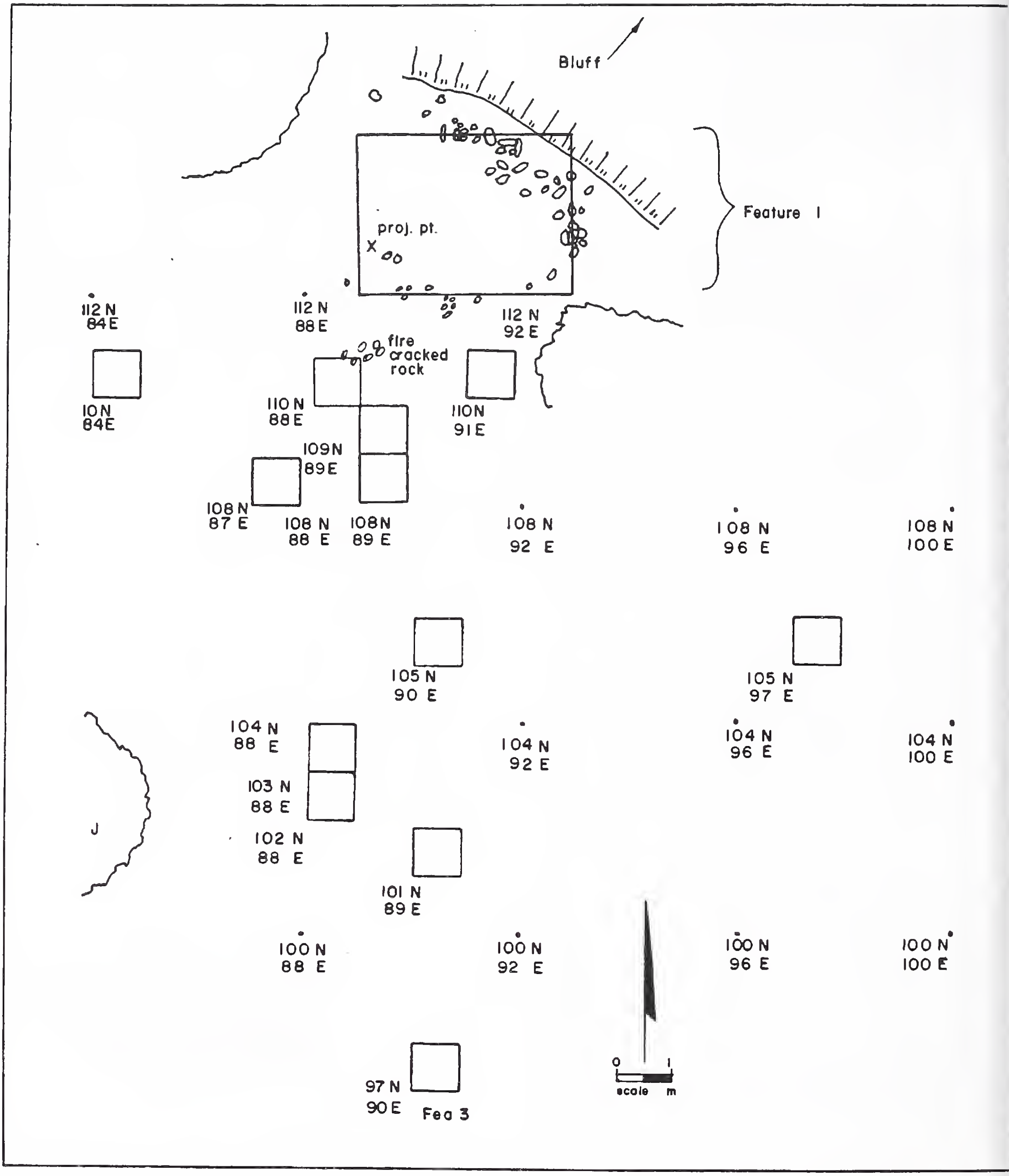
A total of five items was submitted for obsidian hydr tion analysis (Table 3-7). As the provenience of the samples seems to be ambiguous and as none appear be diagnostic items, their hydration dates are difficult assess. It is likely that none of the dates is reliab However, as obsidian dates from other Placitas sit (Tables 3-2 and 3-6; also see Bertram and Burgett, th volume) seem to be systematically several times the expected ages on typological or associational grounds, is likely that a similar case prevails here as well. If s then the obsidian from PL 38A would seem to refle mostly Anasazi and historic occupations, with one da possibly referring to the middle or late Archaic perio

In summary, PL 38A appears to have been a surficial deflated multicomponent lithic scatter with one or tv associated thermal features. Unfortunately, the enti area of the site seems to have been badly erode Hydration dates suggest that occupation might ha occurred in the early Archaic, middle to late Archai Basketmaker, Pueblo IV and Pueblo V periods. If we ha better-controlled obsidian dates from the area, the dates would probably be much too old, indicating th the site reflects occupation in the later Archaic and lat Puebloan periods. The La Bajada point is no long considered a fully diagnostic temporal type (Bertrar 1987), so no reliable temporal period for this site can l proposed.

Table 3-7. Site PL 38A Obsidian Hydration Data.

Forest Service No.	Material[1]	Microns of Rind[2]	Age BP (3500)[3]	Age BP (3520/25)[4]	Age BP (3530)[5]	Age BP (3510)[6]
49	3500	7.2	7693	4896	4308	2491
3	3520	2.3	778	500	436	221
46	3525	4.2	2592	1666	1451	846
41	3530	2.0	595	382	333	194
45	3530	6.4	6078	3908	3405	1988

Notes: 1. As visually sourced following Warren. 2. As measured by UCLA Hydration Laboratory. 3. Assumed material type 3500 (Cerro del Medio?). 4. Assumed material type 3520/25 (Obsidian Ridge). 5. Assumed material type 3530 (Polvadera). 6. Assumed material type 3510 (Grants) (unlikely).



Map 3-6. Site PL 38A with a suspected wall alignment and the location of the projectile point shown in Figure 3-42.

Chapter 4 • Rio Puerco Valley Floral Remains

Mollie S. Toll

Introduction

Analyses of flotation samples, charcoal and macrobotanical materials are reported here for a series of late Basketmaker (Basketmaker II or III) to early Pueblo (Pueblo I or II) sites in the Rio Puerco Valley, west of Albuquerque, New Mexico. The sites include six with scattered lithic and ceramic debris and one (AT 36C) with lithic materials only. Structural debris, in the form of tabular stone and clay with vegetal impressions, was found at two sites (AT 3C and AT 15C) and hearths or hearth debris at three (AT 1A, AT 3C and AT 38C). A below-ground living surface was defined at AT 38C. The sites are located in a variety of topographic situations: beside the Rio Puerco (AT 1A), on or near stable dunes (AT 15C and AT38C), and on eroded floodplain or terrace surfaces (AT 25C, AT 31C).

The study area includes sections north and south of highway I-40 at elevations ranging from 5,250 to 5,800 feet (1600 to 1768 meters). As elevation and distance from the river increase toward the valley rims, topographic units proceed from floodplain, through old terraces and dunes, to eroded badlands and talus slopes. Present deep cutting of the Puerco arroyo has been dated to 1885 and following. Before this period the arroyo experienced cycles of filling (when the valley acted as a true floodplain) and cutting (Bryan 1928; Betancourt 1980).

The combination of a century of heavy overgrazing with poor soils and low precipitation has resulted in a modern plant community that bears little resemblance to prehistoric conditions. Ecologically the area is suited to be a perennial grassland (primarily ricegrass and galleta; Donart et al. 1978) with a shrub overstory in the higher elevations (four-wing saltbush, plus rabbitbrush, sage, greasewood and juniper). Historic accounts describe vast fields of grass in the nineteenth century (Simpson 1852:27; Melitón Cordova, in Bryan [1928:273]).

Forest Service botanist Reggie Fletcher has noted that today in large floodplain areas "*Tribulus terrestris* (puncture vine or goathead; an introduced species unpalatable to livestock due to its boney, spiny fruit, [Martin and Hutchins 1981]) frequently formed a solid mat, and perennial grasses were infrequent" (Fletcher 1982). Vorsila Bohrer (1979) has described major changes in local species composition due to grazing in the Puerco Valley. These changes include principally selective diminution of density or distribution of palatable herbaceous and grass species. *Allium macropetalum* (onion), for instance, is now found only in isolated mesa-top populations, where cattle cannot reach. The cool-season grasses such as *Oryzopsis hymenoides* (ricegrass) are present in greatly reduced numbers (see Bohrer 1975b).

Materials analyzed in this study include 20 flotation samples (mostly from site AT 15C), charcoal from three of these samples and macrobotanical remains collected during excavation (see Table 4-1). This study provides background data on plant utilization in an area of New Mexico badly underrepresented in the realm of botanical analyses of prehistoric sites.

The bulk of archeological work in the Puerco Valley to date has included surveys (Eidenbach [1982] and Cynthia Irwin-Williams' long-term, as yet unpublished Puerco Valley Archeological Project). The small number of floral samples taken from test excavations in the latter project are largely unanalyzed and wholly unpublished. Isolated excavations in the area either preceded the era when botanical samples were taken routinely (Wendorf 1954b; Irwin-Williams & Tompkins 1968), or were at badly eroded surface sites with little or no reliable cultural floral remains (Toll 1981a). Guadalupe Ruin stands out in notable contrast; the substantial body of plant remains at this masonry pueblo are well preserved and have been systematically and carefully reported (Pippin 1979).

Plant remains recovered from the seven sites in the Atrisco parcel are reported in the contexts both of descriptive artifactual material adding to the picture of site function and subsistence activities at these individual sites, and of suggestions as to regional adaptive strategies over time. Recovery of plant debris attributable to the prehistoric occupation in these open sites was generally low. Hence, comments on both descriptive and integrative levels can only be considered indicative, rather than definitive.

Methods

Soil samples collected during excavation were processed by the Castetter Laboratory for Ethnobotanical Studies using the simplified "bucket" version of flotation (see Bohrer and Adams 1977). A measured volume ranging from 350 to 2,000 milliliters was immersed in a bucket of water and a 30 to 40 second interval was allowed for settling out of heavy particles. The solution was then poured through a fine screen (about 0.35 millimeters), catching organic materials floating or in suspension. After the recovered material had dried, each sample was reviewed microscopically at 7-45x. As the soil samples varied in size, it was necessary to adjust the number of seeds recovered to reflect the volume of the sample in liters. Actual number of seeds recovered is reported, as well as the standardized seeds-per-liter.

In the three samples with sufficient charcoal, a sample of 20 pieces was identified. Each piece was snapped to

Table 4-1. Inventory of Flotation and other Botanical Samples Covered in this Report.

Site	Unit	Floattion Samples	Charcoal Samples	Macrobotanical
AT 1A		1	1	4 Auricularia (ear fungus)
AT 3		-	-	charred corn (cob/kernel mass)
AT 15C	Strat A	10	-	charred fibrous materi; charred corncob
	Strat C	3	-	charred corncob
	Strat E	1	1	charred corncob
AT 25C	Feature 1	1	-	-
	Feature 2	1	-	-
AT 31C	Feature 1	1	1	charred corncob
AT 36C	Level 1	1	-	-
AT 38C	Feature 2C	1	-	-
Totals		20 (Tables 4-2 & 4-3)	3 (Table 4-4)	7 (Table 4-5)

expose a fresh transverse section and identified at 45x. This same method was used in examining charcoal remains recovered from both sites during excavation. Low-power, incident light identification of wood specimens does not often allow species- or even genus-level precision, but can provide reliable information useful in distinguishing broad patterns of utilization of a major resource class.

Items catalogued during excavation as macrobotanical remains were examined individually. Corn remains were found at three sites and consisted largely of carbonized cob pieces. Specimens were fragmentary and eroded, so that few meaningful measurements could be made. Cupule width and height were measured, as described by Nickerson (1953).

Taxonomy and scientific nomenclature follow Martin and Hutchins (1981). Common names are used according to the Field Guide to Native Vegetation of the Southwestern Region (USDA 1974). Inventories of the contemporary vegetation include Bohrer (1975a) for the Upper Puerco and Cuervo drainages and Fletcher (1982) for the Atrisco parcel itself. The Bohrer list is a compilation of collections made over eight field seasons, spanning the growing season from May through October, and hence is useful for inclusion of ephemeral species that would be critical components of a p toric plant food gathering regime. While valuable be it is specific to the study area, the Fletcher list is li to those species evident during August and Septe of a severe drought year. 1981. Spring annua largely missing from this list.

Results

Site AT 1A

Site AT 1A is an extensive lithic scatter, with diag materials spanning the periods from Basketma through Pueblo III. This floodplain site is situated to the edge of the present Rio Puerco arroyo. The flotation sample (Table 4-2) from a charcoal stai ten centimeters below present ground surface proc only three unburned seeds of annual weed sp occurring in the Puerco drainage today (Bohrer 1 Fletcher 1982). Charcoal in this sample (Table indicated that the fuel used in this instance was la saltbush (the principal floodplain shrub species). quantities of cottonwood/willow-type charcoal att use of prehistoric riparian habitats now largely mi from the modern streamside plant community.

Table 4-2. Flotation Results from Miscellaneous Sites.

Site/Sample	WOODY PERENNIALS: Atriplex fourwing saltbush	Juniperus juniper	Sarcobatus greasewood	GRASSES: Oryzopsis ricegrass	Sporobolus dropseed	POSSIBLE ECONOMICS: Chenopodium goosefoot	Amaranthus pigweed	Portulaca purslane	Monolepis povertyweed	Mentzelia stickleaf	Phacelia scorpionweed	Solanum nightshade	Sphaeralcea globemallow	Descurainia tansy mustard	Yucca yucca	Opuntia prickly pear	Zea mays: corn	PROBABLE CONTAMINANTS: Allionia umbrellawort	Caryophyllaceae pink family	Compositae sunflower family	Cryptantha hiddenflower	Euphorbia spurge	Kallstroemia Mexican poppy	Leguminosae pea family	Unknowns	Modern Vegetation	# Taxa	# Taxa Burned	TOTAL SEEDS: Actual	Estimated
AT 1A #117 Fea.1, Level 1						1/1.8		1/1.[illegible]						1/1.[illegible]													3	0	3	5.4
AT 25C #202 Feature 2						4/3.0																2/1.5	2/1.[illegible]				3	0	8	6.0
#205 Feature 1						3/1.5		2/1.[illegible]										11/ 5.5					8/ 4.0				4	0	24	12.0
AT 31C #398 Feature 1						32/ 35.6*		1/1.1		1/1.1							C*						1/ 1.1				5	2	35	38.9
AT 36C #45 Level 1				1/1.2																							1	0	1	1.2
AT 38C #25 Feature 2-C																									+[1]		1	0	2	1.0

[1]9076 (2/1.0). *Some or all items charred. Number above slash indicates actual number of seeds counted; number below the slash indicates estimated number of seeds per liter of soil. C = cupules

At 20 to 40 centimeters below surface, four ear fungus specimens (*Auricularia* sp.) were recovered from a dense lithic scatter. This genus is probably edible, tends to grow on coniferous dead wood (in this area, talus and mesa junipers are the likely hosts), staying shriveled and dried up during much of the year and becoming "gelatinous" or "cartilaginous" during cool wet periods (William C. Martin, personal communication; see also Smith [1975]). While *Auricularia* is not likely to grow on flood plain shrubs in the immediate site vicinity today, the possibility of modern origin for these specimens should not be ruled out. Preservation conditions are not good in these shallow sites and it is unlikely that these desiccated but uncarbonized fungi would have survived here for multiple centuries.

Site AT 3C

AT 3C dates from Basketmaker III through Pueblo I and II. Debris consisting of tabular stone and clay or daub with vegetal impressions, indicates prehistoric structures were present, so that there is at least the possibility of preservation of cultural plant materials in unexposed portions of the site. A carbonized corn cob and kernel mass was picked up during survey. Such fused masses usually occur in storage contexts where "catastrophic" fires have taken place (e.g., Toll 1982a:34; Doebley and Bohrer 1980:169).

Site AT 15C

AT 15C, an extensive, deeply-buried Puebloan site, produced the bulk of flotation and macrobotanical materials reviewed in this report. Carbon-14 dates (A.D. 553 ± 93, A.D. 833 ± 178) place occupation in the Pueblo I or late Basketmaker periods (Bertram, this volume).

Samples were taken chiefly (10 of 14) from Stratum A, about 0.5 meter thick and presumed to be largely post-occupational. These samples are characterized by high seed density (Table 4-3), but note that modern intrusive material may be responsible: *Sporobolus* seeds, all unburned, make up 51 percent of all seeds recovered and items that are clearly modern floral debris (capsules and bracts of the introduced weed, *Salsola*, *Dithyrea* seed pods and Gramineae florets) are found in most samples. Cultural plant material is also found in these samples: both *Chenopodium* and *Portulaca* include carbonized specimens (in six out of the nine samples it appears in, and one out of ten, respectively). Both taxa are annual weeds figuring prominently in historic accounts of wild plant use in the Southwest (Castetter 1935; Curtin 1949; Stevenson 1915) and in archeological flotation assemblages of the Archaic to Puebloan eras (Struever 1977; Toll 1982a, 1984; Donaldson and 1982; Gasser 1982).

Tender greens were collected in late spring and summer and the crop of abundant tiny seeds in fall. A single burned *Yucca* seed was also foun sample #68. The broad-leaf yucca (*Yucca baccata* Bohrer 1975a) noted in the modern vegetative com nity has been used extensively for food, as it produ sizeable, starchy, sweet fruit (Hough 1897; Robbi al. 1916; Havard 1895; Whiting 1939). The plant provides roots high in saponin, used for soap, fibrous leaves, used for basketry and matting (Steve 1915; Reagan 1928; Jones 1930). Also recovered Stratum A were some unidentified charred fibrous terials and a corncob fragment.

Stratum B, one of two buried cultural levels at AT produced three flotation samples containing par several carbonized economic plants, including *Junip* *Chenopodium, Amaranthus, Opuntia and Zea*. Jur berries (here represented by a single carbonized se Sample #75) were most frequently employed medici (Robbins et al. 1916; Reagan 1928; Cook 1930) occasionally as a seasoning or famine food (Cast 1935; Swank 1932), due to the presence of st aromatic resins. *Amaranthus* or pigweed was similarly to goosefoot and purslane and prickly provided a sweet and highly-desirable fall-ripening (Castetter 1935; Elmore 1944; Jones 1930). Cont nants in Stratum B are lower in both number and va than in Stratum A. Carbonized corn remains recovered in the form of cupules (the cob fragment holds a pair of side-by-side kernels) in flotation (Tab 3) and a larger cob fragment was found during excava (Table 4-5).

Stratum E, a lower cultural level overlying a li surface, contained charred goosefoot seeds in the si flotation sample. Charcoal was half juniper and saltbush (Table 4-4), as would be consistent with use from the immediate site environs (shrub/grassl with some junipers). A carbonized corncob fragn was also recovered from this level.

Site AT 25C

This widespread site is characterized by lithic ceramic scatters. The ceramic materials date from 500 to 875 (Basketmaker III through Pueblo I). Situ on a flat bajada, the shrub-grassland association been subject to a good deal of sheet erosion as wel grazing pressure. Grazing is the likely cause of prominent place of snakeweed (*Gutierrezia saroth* Fletcher 1982) in the current vegetation.

Table 4-3. Flotation Results from Site AT 15C.

Site/Sample	WOODY PERENNIALS			GRASSES		POSSIBLE ECONOMICS											CULT	PROBABLE CONTAMINANTS										TOTAL SEEDS	
	Atriplex fourwing saltbush	Juniperus juniper	Sarcobatus greasewood	Oryzopsis ricegrass	Sporobolus dropseed	Chenopodium goosefoot	Amaranthus pigweed	Portulaca purslane	Monolepis povertyweed	Mentzelia stickleaf	Phacelia scorpionweed	Solanum nightshade	Sphaeralcea globemallow	Descurainia tansy mustard	Opuntia prickly pear	Yucca yucca	Zea mays corn	Caryophyllaceae pink family	Compositae sunflower family	Cryptantha hiddenflower	Euphorbia spurge	Kallstroemia Mexican poppy	Leguminosae pea family	Others	Modern Vegetation	# Taxa	# Taxa Burned	Actual	Estimated
AT 15C																													
#58 TP 1, Stratum A	1/1.0	T		1/1.0	36/60.0	11/19.0*	2/2.0	3/7.0	1/1.0	5/5.0			1/1.0						6/6.0	8/8.0	4/4.0	5/5.0	3/3.0	a*	O S	21	2	93	129.0
#59 TP 1, Stratum A Ash stain		T		1/0.9	73/177.5	9/22.5*	7/10.[illegible]	8/18.4		12/8.7	6/5.0	1/0.9	1/0.9						13/27.2	36/53.4	8/16.7	4/9.5	2/1.7	b*	O S	20	2	227	383.2
#62 TP 2, Stratum A Feature 2					73/102.[illegible]	4/8.9	3/6.7	16/57.8		12/26.7		1/2.2							3/6.7	2/4.4	5/11.1	2/4.4		c	O	13	0	126	442.2
#63 TP 2, Stratum A Feature 2					63/100.0	2/5.6	7/15.6	6/13.3		7/15.6			1/2.2						1/2.2		1/3.3	1/2.2		d	O,G S	13	0	92	266.7
#64 TP 2, Stratum A Feature 2			1/1.5		105/161.5	7/* 10.8	3/4.6	17/26.2		7/10.8	1/1.5		2/3.1						4/6.2	11/16.9	8/12.3	1/1.5		e*		14	3	169	259.9
#65 TP 2, Stratum A Ash stain				1/2.2	121/268.9	4/8.9	2/4.4	18/40.0		14/31.1	1/2.2								4/8.9	2/4.4	7/15.6	3/6.7		f	D S	15	0	186	413.3
#66 TP 2, Stratum A					49/122.5	3/7.5*		10/25.0		4/10.0									4/10.0	14/35.0	2/5.0	1/2.5		g	O	11	1	90	225.0
#67 TP 2, Stratum A					25/71.4		1/2.9	5/14.3		2/5.7										8/22.9	3/8.6			h	D S	9	0	45	128.7
#68 TP 2, Stratum A						49/* 61.3		1/* 1.3								1/1.3*										3	3	51	63.9
#72 TP3, Stratum A				1/1.0																					O	2	0	1	1.0
#73 TP 3, Stratum B	7/7.0			3/3.0	4/4.0	9/9.0*	5/5.0	1/1.0		16/16.0		1/1.0							45/45.0	5/5.0	3/3.0	10/10.0	1/1.0	i		16	1	145	145.0
#75 TP 1, Statum B		1/* 10.0				3/30.0*									1/* 10.0		C*									4	4	5	50.0
#84 TP4, Stratum B				1/2.2		4/8.9*	1/2.2*										C*		2/4.4	2/4.4						6	3	10	22.1
#87 TP4, Stratum E Feature 3					5/3.6	95/67.9*	3/2.1	27/19.3						11/7.9				78/55.7			9/6.4			j		9	1	229	163.6
Total est. seeds	8.0	10.0	1.5	10.[illegible]	1371.[illegible]	260.[illegible]	56.0	223.[illegible]	1.0	129.6	8.7	4.1	7.2	7.9	10.0	1.3	---	55.7	116.6	154.[illegible]	86.0	51.8	5.7	123.[illegible]	---				2693.6
% estimated seeds	+	+	+	+	51%	10%	2%	8%	+	5%	+	+	+	+	+	+	---	2%	4%	6%	3%	2%	+	[illegible]%	---				
# samples (n=14)	2	3	1	6	10	12	10	11	1	9	3	3	4	1	1	1	2	1	9	9	10	8	3	10	8				
% samples	14%	21%	7%	43%	71%	86%	71%	79%	7%	64%	21%	21%	29%	7%	7%	7%	14%	7%	64%	64%	71%	57%	21%	71%	57%				

*T = twigs. C = cupules. *some or all items charred. ± = less than 0.5%*

Number above slash indicates actual number of seeds counted; number below slash indicates estimated number of seeds per liter of soil. ªUnknown 9091 (3/3.0), 9092 (1/1.0), 9999 (1/1.0), Allionia (1/1.0). ᵇ9091 (22/16.0), 9092 (1/0.9)*, 9093 (3/2.5). ᶜ9091 (4/8.9), 9092 (1/2.2). ᵈ9091 (3/6.7). ᵉ9999 (2/3.0)* (two different seeds). ᶠ9091 (8/17.8) 9092 (1/2.2). ᵍ9091 (2/5.0), 9093 (1/2.5). ʰ9091 (1/2.9). ⁱ9091 (26/26.0), 9092 (2/2.0), 9093 (7/7.0). ʲ9092 (1/0.7). D = Dithyrea seed pod fragments. S = Salsola capsule parts. G = Gramineae florets and fragments.*

Table 4-4. Charcoal Composition, Atrisco Flotation Samples.

	CONIFER 1*	NON-CONIFER 2*	3*	4*	5*	6*	TOTAL 7
AT 1A #117							
#/% pieces		15/75%		3/15	2/10%	20/100%	20/100%
#/% by weight[g]		0.7/100%		+	+	0.7/100%	0.7/100%
AT 15C #87							
#/% pieces	10/50%	10/50%				10/50%	20/100%
#/% by weight[g]	0.2/50%	0.2/50%				0.2/50%	0.4/100%
AT 31C #398							
#/% pieces	10/50%	9/45%	1/5%			10/50%	20/100%
#/% by weight[g]	0.5/71%	0.2/29%	+			0.2/29%	0.7/100%

(+ = less than 0.05 g.)

Key: 1* Juniperus 2* Atriplex 3* Sarcobatus
4* Populus/Salix 5* Undetermined 6* Total non-conifer

Table 4-5. Dimensions of Corn Specimens, Atrisco Sites.

Site and material	COB Row No.	COB Diameter mm	CUPULE Width mm	CUPULE Height mm	KERNEL Width mm	KERNEL Height mm
AT 3C [no FS#] fused cob/kernel mass	-	-	-	-	7.0	2.5
AT 15C/#20 broken corncob fragment	10?	-	7.2	3.5	-	-
AT 15C/#22 corncob fragment	10?	12.0	5.0	2.2	-	-
AT 15C/#25 corncob fragment	8	12.5	7.5	3.2	-	-
AT 31C/#377 corncob fragment	12	12.5	6.0	3.5	-	-

Cultural deposits at this site are shallow (within 15 centimeters of ground surface) so it is not surprising that Features 1 and 2 are both represented by a small array of unburned annual weed seeds, loaded towards probable contaminant species (Table 4-2).

Site AT 31C

AT 31C is another extensive lithic and ceramic sc[atter] with ceramics dating from Basketmaker III thr[ough] Pueblo I. This site has also experienced sheet er[osion] and it is located on a gravel terrace.

Table 4-6. Comparative Flotation Remains, Rio Puerco Archeological Sites.

Sites	Site Description	Preservation	Economic	Contaminants
Elena Gallegos Sites [1]	7 open sites (mostly shallow and eroded) BMIII - PIII	Poor to Fair	corn, weeds, cacti & yucca juniper	abundant & varied (less so at two sites with deeper deposits
BLM Sites[2]	2 undated sites (shallow, eroded)	Poor	none	numerous and varied
PVAP[3]	3 undated sites	Poor	spurge??	numerous and varied
Guadalupe Ruin[4]	masonry pueblo w/protected deposits PI-PIII	Excellent	corn and squash, grasses, weeds, cacti & yucca, shrubfruits, pinyon/juniper, sedge and reed	practically none

Notes: [1]This study [2]Toll 1981 [3]The Puerco Valley Archeological Project (Irwin-Williams, Director) includes samples from numerous open sites Archaic-PIII. Largely unanalyzed and unreported. Floatation data come from a sample sorted by Alan Reed (Karen Adams, personal communication). [4]Pippin 1979

The single flotation sample analyzed form this site derives from probable midden deposits and contains reliable cultural plant materials. Both charred goosefoot and corn were present in flotation (Table 4-2) and corn occurred again as macrobotanical remains (Table 4-5). Charcoal is half juniper (by number of pieces, though more by weight) and half non-coniferous shrubs (mostly saltbush; Table 4-4).

Site AT 36C

Next to a slight rise with a blowout on top, AT 36C included only ground stone and chipped stone debris that was not diagnostic as to cultural or chronological period. Ceramics (more likely to provide such information) were absent. The subsurface living surface represented by the single flotation sample here produced only one unburned ricegrass caryopsis, and consequently no clues as to prehistoric subsistence activities.

Site AT 38C

This lithic and ceramic scatter was located in a blowout on a semi-stabilized dune ridge. Ceramics indicated a Pueblo II occupation (A.D. 1000 to 1050). Modern vegetation includes grasses, snakeweed (again, a grazing indicator) and yucca (which frequently occurs in sandy dune environments).

The single flotation sample was taken from a charcoal stain (Feature 2C), probably representing a cleaning episode from a nearby hearth. The only flotation materials recovered were two unidentified modern weed seeds.

Summary and Discussion of Results

The Effect of Preservation

Plant remains at these seven Puerco Valley sites show familiar signs of how site attributes affect preservation. As noted elsewhere (Donaldson 1981a), quantity, variety and reliability of cultural association of plant materials all decrease at sites with shallow, eroded deposits. Flotation materials at Sites AT 1A, 25C, 36C and 38C, consist largely of unburned weed and grass seeds, with a high proportion of taxa falling into the category of probable contaminants. By contrast, the two sites with more deeply buried deposits include plant material that is clearly cultural. At AT 15C, the best record of early

Puebloan plant utilization comes from the lower cultural strata (B & E), which contained charred specimens of juniper, pigweed, goosefoot, prickly pear and corn. Closer to the surface, post-occupational Stratum A contained some economic materials (charred goosefoot, purslane, yucca and macrobotanical corn) mixed in with abundant and varied contaminants. At AT 31C, flotation samples from test pits placed in midden areas netted burned goosefoot and corn.

Charcoal, somewhat less susceptible to the deteriorating effects of erosion and proximity to the surface (Wood and Johnson 1978), provides fuel utilization data at Site AT 1A, in addition to Sites AT 15C and 31C. The three samples indicate that saltbush and juniper were major fuel components. Relative proportions vary with the vegetative associations of the immediate site environs: saltbush is more prominent at AT 1A, located on flood plain near the wash, and juniper is more pr nent at AT 15C and 31C, located at slightly hi elevations with some juniper in the vicinity. The small pieces of cottonwood/willow-type which tu up at AT 1A reveal some use of former riparian hab along the prehistoric wash.

As corn has a durable waste product (the cob) wi relatively good chance of surviving both carboniza and deposition, it tends to be included in agricultu period assemblages even when other economics present only in low numbers. The small quant present in flotation and macrobotanical specir (chiefly carbonized cob fragments) are enough to firm that corn agriculture was practiced throughout study area in the late Basketmaker and early Pu periods.

Table 4-7. Comparative Charcoal Remains, Rio Puerco Archeological Sites.

Sites	Description	Juniper	Other Conifers	Saltbush/ greasewood	Cottonwood/ willow	Other Non-conifers	TOTAL
AT 1A[1] BMII-PIII [F]	extensive lithic scatter,						
	#/% pieces	-	-	15/75%	3/15%	2/10%	20/100%
	g/% weight	-	-	0.7/100%	+	+	0.7g/100%
AT 15C[1] [F]	buried Puebloan site, PI						
	#/%pieces	10/50%	-	10/50%	-	-	20/100%
	g/% weight	0.2/50%	-	0.2/50%	-	-	0.4g/10
AT 31C[1] [F]	extensive lithic and ceramic scatter, BMIII-PI						
	#/% pieces	10/50%	-	10/50%	-	-	20/100%
	g/% weight	0.5/71%	-	0.2/29%	-	-	0.7g/100%
BLM 20104[2] [F]	extensive lithic and groundstone scatter, undated						
	#/% pieces	12/80%	1/7%	2/13%	-	-	15/100%
BLM 20153[2] [F]	isolated hearth, undated						
	#/% pieces	-	-	20/100%	-	-	20/100%
Guadalupe Pueblo[3] [C]	masonry pueblo, PI-III						
	#/% pieces	1/1%	87/96%[4]	-	2/2%	1/1%[5]	91/100%

Notes: +less than 0.05 grams Wood function code -- [F=fuel C=Construction]
[1]This study [2]Toll 1981 [3]Pippin 1979
[4]Largely ponderosa pine and pinyon
[5]May include some saltbush or greasewood.

The larger corn specimens (Table 4-5) reveal that both cobs and kernels tended to be small and that row number varied from eight to twelve per ear. These attributes compare generally with the characteristics of Anasazi corn seen a short distance north, in the Chaco (Struever 1977, Toll 1981a), Bis sa'ani (Donaldson and Toll 1982) and Crownpoint (Donaldson 1981b) areas. However, the range of variation present in this tiny sample does not allow comparison with any particular period or area; these corn specimens could fit in with any of several populations. Perhaps most significant is not the morphometrics, but the fact that the cobs show undeveloped rows and other signs of stressful growing conditions (Robins & Domingo 1953).

Comparison With The Floral Records Of Other Puerco Valley Sites

To date, there is little in the way of a floral record from the Anasazi occupation of the Puerco Valley. The few archeological studies that have included botanical analyses vary widely in site type and preservation, and in extent and method of reporting, so that results are far from comparable. Although the sites from the Elena Gallegos Atrisco parcel do not exhibit the best preservation, they are better off than some and actually provide some information on local subsistence that is otherwise missing.

Carbonized plant materials at the Atrisco sites indicate that corn agriculture was practiced and that local wild food plants included several annual weed species, plus prickly pear cactus, yucca and juniper berries. The three weeds represented (*Chenopodium, Amaranthus* and *Portulaca*) are those same genera occurring most commonly at Anasazi sites throughout the San Juan Basin (Toll 1984). The few other Puerco Valley sites for which flotation data exist (Table 4-7) provide no real information on subsistence. The charred *Euphorbia* seeds encountered at two sites in the middle Puerco (Karen Adams, personal communication) may be prehistoric contaminants accidentally carbonized, or may represent a minor food product. There is no indication in the nutritional or phenological characteristics of the plant to suggest particular food potential, and no indication in the ethnographic literature that the taxon has ever played any significant dietary role (see Stevenson 1915; Reagan 1928).

Plant remains at Guadalupe Ruin, about 30 kilometers to the north and about a kilometer southwest of the Rio Puerco, exhibit a considerably greater variety of domesticated and wild economics. This masonry pueblo high on a shale outcrop is a very different kind and size of site. Although there are contemporary small sites in the vicinity of Guadalupe Ruin, the site essentially represents an occupation both later in time and with extra-local ties to Chaco Canyon. On the other hand, the protective walls and elevated isolation from the source of most contaminants have produced a specialized preservation situation. As at Bis sa'ani Pueblo (Donaldson and Toll 1982a) the plant array includes many unburned specimens which can be assigned prehistoric economic significance because intentional gathering from some distance away would have been necessary (pinyon nuts, shrub fruits, sedges, reeds), or because they are domesticates (corn, squash and a possible bean; Pippin [1979]). Again, as at Bis sa'ani, either the larger pueblo's special status and extra-local ties, or the special preservation conditions, could explain the presence of these materials.

In the case of Bis sa'ani, a well-preserved small site nearby revealed that the reeds and "exotic" foodstuffs were not restricted to the central Chacoan outlier but were present to some degree in smaller units of the community also (Donaldson and Toll 1982). Such a clarifying example is lacking for the Puerco Valley.

A similar contrast, with attendant questions, is found in the record of wood use at Guadalupe and smaller (or more dispersed) Puerco sites. The small sites exhibit some variability (attributable to site location) in relative frequencies of saltbush, juniper and riparian species. Guadalupe stands out in almost exclusive use of conifers brought in from 12 kilometers or more away (Table 4-6; Pippin 1979: 240). Preservation is not a major issue here. The principal question is rather whether the abrupt differences in species composition of wood used are due chiefly to pragmatic, functional concerns (none of the smaller and earlier sites have such ambitious needs for longer construction timbers), or whether the population at Guadalupe maintained some differential access to non-local economic products.

One final area of potential contrast between the subsistence record at Guadalupe Pueblo and that at the Atrisco sites farther down the Puerco Valley lies in the realm of geographic suitability for farming. The Puerco Valley as a whole is not well suited to agriculture, but conditions are even less propitious as you progress southward. Water in the Puerco is of poor quality (high in suspended and dissolved solids [Love and Hawley, in Eidenbach 1982:18]). The prime source of farming water is thus rain, but as precipitation is low and infiltration rates high, the only locations where runoff moisture is sufficiently concentrated are directly at the base of features such as rock taluses, mesas and steep colluvial slopes, preferably with a shale underlayer to retain moisture in the root zone. Such elevational relief occurs far more frequently north of the Atrisco study area, in the Mesa

Chivato/Mesa Prieta area. To the south, broad, flat expanses provide fewer situations with potential for concentrating runoff.

In the middle Puerco, evidence for the practice of agriculture consists of the co-occurrence of site concentrations and arable colluvial soils in the Basketmaker III - Pueblo I period, with "agglomeration of sites around arable land and the appearance of stone water diversion features in the Pueblo II - Pueblo III period" (Washburn 1974). In the lower Puerco, no irrigation features have been found and sites date principally to the Basketmaker III - Pueblo II range (see Eidenbach 1982).

It has been suggested that local occupation in the lower Puerco Valley may have decreased as farming became the principal, rather than supplementary, subsistence adaptation (Ibid.; Lonnie Pippin, personal communication). Irwin-Williams (1983) points to intrusion of Chacoan outliers, such as Guadalupe, as factors triggering special economic and demographic adaptations in the middle Puerco area. While surveys in both areas have helped to lay the groundwork in mapping out demographic patterns over time in the middle and lower Puerco, testing and refining of these hypotheses describing diachronic economic patterns will require detailed excavation of varied individual sites. As a source of information about what plant products were actually used in specific site contexts, botanical an ses will be a critical link in this research.

Conclusions

Floral remains from flotation samples and macrobotar specimens give evidence of late Basketmaker/e Puebloan subsistence use of corn agriculture toge with local wild plant foods. Three annual weeds, go foot, pigweed and purslane, are represented along prickly pear cactus, yucca and juniper berries. Pre vation limitations at these open sites are prob responsible for the absence of evidence of other m crop plants (squash and beans) and a wider arra weedy species. Charcoal samples indicate that sources were close at hand and included the predo nant local shrub, saltbush and scrub junipers at s located in slightly higher elevations.

Acknowledgments

Michelle Jespersen performed water-processing of m of the flotation samples. Beth Crowder provided mic scopic sorting and identification of floral materials fr flotation samples; she also tabulated flotation data a typed the manuscript. My thanks to both.

Chapter 5 • Food and Fuel Use at PL 30A and 32A

Mollie S. Toll

Introduction

Botanical materials recovered during excavation of two sites in the Placitas Sector provide some insight into local plant utilization in the little-known Puebloan occupation of this area. Data reported here include botanical remains recovered by floatation (a simple water-separation technique), macrobotanical specimens collected during excavation, and species identification of charcoal. These materials provide direct documentation of food and fuel taxa utilized at each of the sites.

The two sites discussed here consist in each case of a two-unit masonry room block, with extramural work areas or other features. Ceramics at PL 30A include types (e.g., Red Mesa) that should indicate Pueblo II or III occupation of post-1000 A.D., but this is contradicted by radiocarbon dates of A.D. 600 to 800 (Charles Haecker, personal communication). PL 32A is considerably later, dating to the Pueblo IV period (about 1500 A.D.). Floatation samples at each site were taken from room floors, and from interior and exterior features with some potential relation to food processing activities (hearths, storage features, trash dumps). Cultural plant remains may contribute information as to differentiation in room use and to function of specific features. At PL 30A, roof fall, and ramada and extramural work surfaces were also sampled, as these were suspected to be possible food processing areas. In all, 25 floatation samples were analyzed from PL 30A, and 15 from PL 32A, with sufficient charcoal for identification present in five and eight samples respectively. Macrobotanical materials were recovered during excavation at Site PL 32A only.

Both sites are located in the foothills of the Sandia Mountains northeast of Albuquerque. As part of New Mexico's central mountain region, this area is subject to the Rocky Mountain floral influence (Martin and Hutchins 1981). Situated between elevations of approximately 5200 to 6100 feet (1585 to 1860 meters), the study area is at the lower limits of the pinyon-juniper vegetation association. One-seed juniper (*Juniperus monosperma*) is the predominant (but sparsely scattered) tree species, with rarer occurrences of Colorado pinyon (*Pinus edulis*), primarily at the upper elevational limits of the study area. The slightly alkaline, gravelly, well-drained soils favor sparse grass cover including aristidas (*Aristida* spp.), ring muhly (*Muhlenbergia torreyi*), and Indian ricegrass (*Oryzopsis hymenoides*), various cacti including cholla (*Opuntia imbricata*), shrubs and subshrubs including snakeweed (*Gutierrezia sarothrae*), rabbitbrush (*Chrysothamnus nauseosus*), and saltbush (*Atriplex canescens*), and also narrowleaf yucca (*Yucca glauca*; Reggie Fletcher, personal communication; Helene Warren, personal communication).

Water sources available to the site occupants include two intermittent drainages, Las Huertas Creek and a nearby major tributary. The Rio Grande River is two to four kilometers to the northwest. Rock alignments on sandy flats north of the sites suggest that the ephemeral stream flow of Las Huertas and its tributary may have been diverted to irrigate agricultural fields (Helene Warren, personal communication). Riparian vegetation along the Rio Grande provided a potential source of food, fuel and construction materials over a prolonged growing season, as well as a habitat for year-round and migratory faunal resources, within a reasonable single day's foraging distance.

Methods

Initial processing of the floatation samples was carried out at the Castetter Laboratory for Ethnobotanical Studies. It utilized a simple technique based on the principle that organic materials tend to be less dense than water and will float or remain in suspension. Coarse soils are particularly well suited to this technique as the heavy sand particles sink rapidly in a water solution, thus affording a clean separation of materials. A measured volume of archeological matrix (ranging from slightly less to slightly more than one liter), was immersed in a bucket of water, and sand particles were allowed to settle out for a period of 30 to 45 seconds. The water was then poured through a fine mesh (0.35 millimeter) screen. The bucket was subsequently filled and screened repeatedly, until no appreciable amount of material was left floating in suspension. This basic method was used as long ago as 1936 (see Watson 1976:78) but did not become widely used for recovery of subsistence data until the 1960s and '70s (Struever 1968; Bohrer and Adams 1977).

The screened materials were subsequently dried on newsprint, then sorted by particle size with the use of a series of graduated geological screens (mesh sizes 2.0, 1.0, 0.5 and 0.25 millimeters). The screen separation produces a rough sorting of seed types, facilitating microscopic scanning and identification. Each particle size was sorted twice. For the second pass through, particles were rolled closer together, to expose different orientations of fragmentary and distorted plant parts. Small numbers of potentially identifiable seeds are often revealed by this second scan, but experiments have shown that subsequent scans rarely net additional seeds.

Seed taxa were identified at 10-45x magnification. In most cases, the taxon was determined at least to family level and usually to genus or species. The numerical taxonomic coding system devised by Karen Adams was used (1978). Taxonomy and scientific nomenclature are used according to Martin and Hutchins (1981), and common names follow the *Field Guide to Native Vegetation of the Southwestern Region* (USDA 1974). Seeds and other plant parts were also described as to condition (color, damage, charring and retention of such characteristics as hairs and shiny seed coats). Examples of certain non-botanical items were retrieved and their relative abundance noted. These included insect parts, small bones, feces (rodent or insect) and snails. Such information was recorded with the hope of isolating causes of disturbance in the ethnobotanical record.

A sample of 20 pieces of charcoal was identified from each floatation sample containing a sufficient number of pieces greater than two millimeters. Modern comparative specimens were carbonized by heating in sand at 450 to 500 degrees Fahrenheit for two to three hours in a muffle oven. They were then scored with a sharp razor blade, snapped to expose transverse and radial sections, and glued on microscope slides. Archeological samples were snapped to expose a fresh transverse section and identified at 45x. This simplified method of charcoal examination provides reliable identification on the level of conifer vs. nonconifer, and recognition of types with distinctive morphological constellations (such as *Atriplex*, *Chrysothamnus*, *Artemisia*, *Quercus*, *Populus / Salix* and *Pinus edulis*), except when pieces are very small or badly distorted in carbonization. A *Juniperus* type can be distinguished (although there is a possibility of confusion with *Abies*, or fir, which shares some basic morphological characters). Ring-porous and diffuse-porous classes of nonconifers are also distinguishable.

More specific identifications require a greatly increased investment of time and expertise; for each specimen thin-sections in three orientations must be mounted on glass slides, and viewed at 200x or greater. Identifications at this level require as much as two hours per specimen, and years of experience. Given the relatively small investment of effort (two to three 20-piece samples can be processed in an hour), the "snap" technique provides some good information, useful in distinguishing broad patterns of utilization of a major resource class. It should be evident that the analyst has an obligation to err on the side of caution with these identifications, and not imply greater taxonomic precision than the method warrants.

Results

Site PL 30A

PL 30A consists of two masonry rooms with an adjoining ramada and a wingwall (possibly sheltering additional exterior work space). A juniper tree grows today at t western perimeter of the room block, and has clea contributed a good deal of modern debris, in the form twigs, scale leaves, seeds and berries, to the topm Stratum A. Unfortunately this level immediately ov lies or is mixed with cultural levels such as roof and w fall and the room floors; further, this accumulation loose surface debris has encouraged disturbance acti ties of small rodents and insects. The close proximity cultural levels to the present ground surface, soil aci fication from conifer detritus and mixing from faun activity, have all contributed to poor preservation con tions and intrusion of modern botanical materials ir prehistoric cultural layers.

Room 2 (1.8 by 2 meters) was constructed initially. T samples were taken from the wall and roof fall lev #139 contained only probable modern intrusives (u burned juniper and goosefoot seeds; #281 contained seeds or recognizable plant parts, and entirely junip charcoal (Tables 5-1 and 5-2). A location two centim ters above the floor (#200) likewise held only unburn juniper material. An upper floor (Stratum C) of puddl adobe netted artifactual material but no clearly cultu plant remains: #149 contained juniper twigs only, wh #182 had no identifiable floral materials. An orgar stain on this upper floor (#156) was also barren.

A complex of three features is also associated with th floor: Feature 10 is the original, adobe-lined pit, wi Features 11 and 13 superimposed later. All three co tain intentional fill that differs from overlying Stratum Feature 10 may have been a puddling basin, for mixi mortar and plaster during building (Charles Haecke personal communication). There are no identifiab floral specimens in the associated floatation samp (#244). Features 11 and 13 are suggested as ash storage pits; both contain fine silty sand with charcc flecks (too small for identification) and no artifacts.

Feature 13 is the only one of the three that shows a sign of in situ burning of the adobe lining. Still-h hearth contents may have been dumped here at son point; such use would not preclude an earlier stora function for the pit. Botanical remains are not partic larly illuminating, and poor preservation is probab again to be blamed. Feature 11 (#236) contained charr corncob fragments (suggestive of hearth dumpings) ar Feature 13 (#254) nothing. It is worth recognizing at th point that floral remains indicative of storage in suc pits would most likely be unburned, and consequent require optimal rather than marginal preservation co ditions.

The initial floor in Room 2 (Stratum E) was nearly devo of artifacts (two flakes only were recovered), as well as

Table 5-1. Flotation Results, Site PL 30A.

	Conifer		Grasses		Economics			Probable Contaminants					Cacti	Cultivars		Total Seeds			
	Juniperus Juniper	*Pinus edulis* pinyon	*Oryzopsis* ricegrass	*Sporobolus* dropseed	*Chenopodium* goosefoot	Cheno-am	*Corispermum* tickseed	*Mollugo* carpetweed	*Cryptantha* hiddenflower	*Euphorbia* spurge	*Phacelia* scorpionweed	Compositae sunflower family	*Suaeda* seepweed	*Opuntia* cholla	*Zea mays* corn	others	# Taxa	# Taxa burned	Actual Count	Estimated
#21 Test pit 9, ash	T											3/3.0			C*		3	1	3	3.3
#22 Feat.2, borrow-pit (ash pocket)	T									1/0.9					C*		3	1	1	0.9
#75 Feat.2, borrowpit	T																1	0	+	+
#105 Fea.2, borrowpit																	0	0	0	0
#123 post-occup. fill	1/1.4			2/2.9	2/2.9					4/5.7		1/1.4					5	0	10	14.3
#134 post-occup. fill	3/3.6		S[1]		3/3.6			1/1.2		62/74.7						7/8.4[2]	6	0	76	91.5
#139 Room 2, rubble fill	1/1.3				1/1.3												2	0	2	2.6
#146 post-occupational fill	1/1.5				4/6.1							4/6.0[3]					4	0	9	13.6
#149 Room 2, floor	T																1	0	+	+
#156 Room 2, organic stain on floor																	0	0	0	0
#164 Room 1, post-occup. fill and/or wall fall	T											1/1.1[4]					2	0	1	1.1
#177 Room 1, Strat C above floor	T																1	0	+	+
#182 Room 2, floor																	0	0	0	0
#200 Room 2, 2 cm above floor	1/1.3																1	0	1	1.3
#221 Ramada, 1 cm above possible floor	1/1.4																1	0	1	1.4
#224 Room 1, early floor										3/3.3					C*		2	1	3	3.3
#230 Room 1, floor fill					1/1.0												1	0	1	1.0
#231 Unit 70, Strat E																	0	0		
#236 Feat. 11, ash or storage pit															C*		1	1	+	+
#242 Room 2, floor 1	T																1	0	+	+
#244 Room 2, Fea. 10 (hearth or ash pit)																	0	0		
#254 Feat. 18, ash or storage pit																	0	0		
#274 Feat. 5, extra-mural ash & charcoal deposit	T																1	0	+	+
#275 Feat. 5, extra-mural ash & charcoal deposit	T								1/1.1	1/1.1		1/1.1[4]	1/1.1		C*	1/1.1	7	1	5	5.5
#281 Room 2, rubble fill																	0	0		
Total estimated seeds	10.5			2.9	14.9			1.2	1.1	85.7		12.9	1.1			9.5				139.8
% estimated seeds	8%			2%	11%			+	+	61%		9%	+			7%				
# samples (n=25)	15			1	5			1	1	5		5	1			2				
% samples	60%			4%	20%			4%	4%	20%		20%	4%			8%				

*Some or all specimens charred. T=twig fragments. C=dupule. S=shell fragment. Number above slash indicates actual number of seeds recovered; number after slash indicates adjusted number of seeds per liter of soil.
[1] -possible shell fragment. [2] -unknown 9086 (6/7.2), unid (1/1.2). [3] -Type a (1/1.5), Type b (3/4.5). [4] -Type a.

Table 5-2. Charcoal Composition, PL 30A

	Coniferous					Non-Coniferous			
Sample/Provenience	**Unknown**	***Juniperus* Juniper**	***Pinus edulis* pinyon**	**Unknown conifer**	**Total**	***Atriplex* four-winged saltbrush**	**Other/Unknown non-conifer**	**Total**	**Total**
#21 Test Pit 9, ash		10 0.1	1 +	3 +	14 0.1	5 0.1	1 +	6 0.1	20 0.2g
#22 Feature 2, borrowpit	2 +	13 0.3	4 0.1	1 +	18 0.4				20 0.4g
#105 Feature 2, borrowpit		20 0.4			20 0.4				20 0.4g
#230 Room 1, floor fill		16 0.6		2 0.1	18 0.7	2 +		2 +	20 0.7g
#281 Room 2, rubble fill		20 0.6			20 0.6				20 0.6g
# pieces	2	79	5	6	90	7	1	8	100
% pieces	2%	79%	5%	6%	90%	7%	1%	8%	100%
total weight	+	2.0	0.1	0.1	2.2	0.1	+	0.1	2.3
%weight	+	87%	4%	4%	96%	4%	+	4%	100%

Note: + = less than 0.05g or 0.5%

cultural trash such as roof fall. Floatation sample #242 contained unburned juniper twigs only, again probably a legacy from the juniper tree currently overhead.

Room 1, a two by three meter space added on to the north end of Room 2, produced floral remains similar in composition and quantity to those recovered from Room 2. The two rooms may have been used differentially with respect to plant utilization activities, but poor preservation does not allow us to discern any such patterning. A sample from post-occupational wall or roof fall (#164) contained juniper twigs and a modern composite achene, while Stratum C above the floor (#177) produced only juniper (Table 5-3). A sample from the initial floor (#224) produced charred corncob fragments, but also some probable contaminants (unburned spurge seeds). Floor fill (Stratum E; #230) contained an uncarbonized goosefoot seed and charcoal again predominantly coniferous (80 percent juniper) with some saltbush (Table ! Post-occupational fill from the general Feature 1 (Ro 1 and 2) area included several types of unburned p able modern material (samples #123, 134, 146). proposed ramada area to the south of Room 2 is d mented only by sample #221 (containing only jun debris) from just above the possible work surface. work done in this area is suggested to have been li reduction, based on flake concentration, and botan data provides no contradiction or amplification of interpretation.

Two extra-mural features at PL 30A provide some in mation about hearth contents during site occupat Feature 2, located two meters south of the room bl fits morphologically with a substantial clay borrow used during room construction. It was later used a trash dump, with fill containing charcoal and a

Table 5-3. Flotation Results, Site PL 32A.

	Conifer		Grasses			Economics		Probable Contaminants						Cacti	Cultivars		Total Seeds			
	Juniperus Juniper	*Pinus edulis* pinyon	*Oryzopsis* ricegrass	*Sporobolus* dropseed	*Chenopodium* goosefoot	*Portulaca* purslane	*Corispermum* tickseed	*Descurainia* tangy mustard	*Cryptantha* hiddenflower	*Euphorbia* spurge	*Phacelia* scorpionweed	Compositae sunflower family	*Mollugo* carpetweed	*Opuntia* cholla	*Zea mays* corn	others	# Taxa	# Taxa burned	Actual Count	Estimated
Room 1																				
#198 Room 1, Level 5	T			1/1.5	1/1.5				+								4	0	2	3.0
#243 Room 1, south of Feat. 10 ash pit	T		1/0.6														2	1	1	0.6
#259 Room 1, Feat. 10, ash pit	T			1/0.5	7/3.5		1/0.5		1/0.5				1/0.5		C*	1/0.5[1]	8	2	12	6.0
Room 2																				
#291 Room 2, SW corner Level 6	T*																1	1	—	—
#314 Room 2, SE corner Level 6	T		1/1.2		16/. 18.8	1/ 0.2		1/1.2		6/7.1	1/1.2*					+[2]	9	7	53	62.5
#362 Room 2, Feat. 18, hearth	T*		4/2.0	1/0.5	1/1.0												4	2	6	3.5
#363 Room 2, Feat. 18, hearth	T*		4/4.0		1/0.5							1/1.0					4	2	6	5.5
#366 Room 2, Feat. 11, food processing area	T*				1/1.0											2/2.0[3]	3	1	3	3.0
#375 Room 2, Fea. 11, (below adobe floor)					2/1.0												1	0	2	1.0
Outside room block																				
#76 Feat. 2, charcoal conc.	51/ 96.2*		3/11.	3/11.3						1/3.8				1/1.9		13[4]/. 49.0	8	5	72	173.5
#89 Inside vessel (FS80)	1/1.7																1	0	1	1.7
#299 Ash lens	T				1/0.7												2		1	0.7
#390 Feat. 12, storage structure? (floor)																	0	0		
#400 Feat. 12, storage structure? (floor)																	0	0		
#401 Feat. 12, storage structure? (subfloor)					1/0.5											3/1.5[5]	2	2	4	2.0
Total estimated seeds	97.9		19.1	13.8	28.5	1.2	0.5	1.2	0.5	10.9	1.2	1.0	0.5	1.9	—	53.0				263.0
% estimated seeds	37%		7%	5%	11%	+	+	+	+	4%	+	+	+	+		20%				
# samples	11		5	4	9	1	1	1	2	2	1	1	1	1	1	7				
% samples (n=15)	73%		33%	27%	60%	7%	7%	7%	13%	13%	7%	7%	7%	7%	7%	40%				

Notes: [1] - Cheno-Am 1/0.5. [2] - cf. *Melilotus* 26/30.6*, Gramineae 1/1.2*. [3] - Unid. T=twig, C=cupule.
some or all specimens charred. [4] - Suaeda 3/11.3, Cheno-Am 2/7.5, Salsola 8/30.2*.
[5] - Unid. +less than 0.5%

Table 5-4. Charcoal Composition, PL 32A.

Sample/Provenience	Coniferous					Non-Coniferous					
	Unknown	*Juniperus* Juniper	*Pinus edulis* pinyon	Unknown conifer	Total	*Atriplex* four-winged saltbrush	*Artimisia* sagebrush	*Chrysothamnus* rabbitbrush	Other/Unknown non-conifer	Total	Tot
#243 Room 1, south of Feature 10 ash pit		13 0.2	3 +	3 0.4	19 0.6	1 +				1 +	20 0.6
#259 Room 1 Fea. 10 ash pit	1 +	2 +	1 +	1 +	4 +	15 0.4				15 0.4	20 0.4
#291 Room 2, SW corner, Level 6	1 +	6 +			6 +	13 0.5				13 0.5	20 0.5
#299 ash lens		20 0.3			20 0.3						20 0.3
#314 Room 2, SE corner, Level 6		15 0.5			15 0.5	2 +			3 0.1	5 0.1	20 0.6
#362 Room 2, F. 13 hearth		7 0.5			7 0.5	10 0.2	1 +		2 +	13 0.2	20 0.7
#363 Room 2, F. 13 hearth		2 0.1			2 0.1	17 0.4		1 +		18 0.4	20 0.5
#410 Feature 12, storage structure? (subfloor)	1 0.1	18 0.3			18 0.3	1 +				1 +	20 0.3
# pieces	3	83	4	4	91	59	1	1	5	66	160
% pieces	2%	52%	3%	3%	57%	37%	1%	1%	3%	41%	100
total weight	0.1	1.9	+	0.4	2.3	1.5	+	+	0.1	1.6	3.9
% weight	3	49%	+	10%	59%	38%	+	+	3%	41%	100

Note: + = less than 0.05g or 0.5%

Floatation samples (#21, 22, 75 and 105) contained no Puebloan plant debris but small amounts of probable contaminants. The pit seems to have received firepit or other dumpings on multiple occasions as charcoal composition varies from location to location within the pit: #105 is entirely juniper, while #22 is substantially juniper and secondarily pinyon, and #21 has a size component of saltbush in addition to juniper.

Feature 5 is an ash and charcoal deposit lying on extramural surface adjacent to the wing wall; interpreted as a probable hearth dump since there

Table 5-5. Economic Taxa at Pueblo Sites in North-Central New Mexico.

Site(s)	Location	Approx Elevation	Period	Edible Weeds						Cacti		Perennials				Cultivars		
				pigweed	goosefoot	purslane	beeweed	sumpweed	sunflower	pricklypear	hedgehog	yucca	chokecherry	pinyon	juniper	corn	beans	squash
PL 30A, PL 32A	Placitas area	1615 m	P I-III?; P IV	—	+•	+•	—	—	—	—	—	—	—	+	+•	+•	—	—
Nuestra Senora de Dolores[1]	Rio Grande Valley	1540 m	P IV	+•	+•	+•	—	—	—	+•	+•	—	—	+•	+•	+•	—	—
GB sites[2]	Gallina area	2200 m	Gallina Phase (Pueblo)	+•	+•	+	—	—	+•	+	+	—	—	+	—	+•	+•	+•
Nogales Cliffhouse[3]	Gallina area	2200 m	" "	?	?	?	?	?	?	+•	?	+•	?	+•	?	+•	+•	+•
Howiri Pueblo[4]	Rio Arriba Co.	2100 m	P IV	•	+•	+•	+•	—	—	+•	+•	+	—	+•	+•	+•	—	—
Rowe Pueblo[5]	Pecos Valley	2100 m	Late Pueblo	+•	+•	+	—	—	—	—	—	—	+•	+	+•	+•	—	—
Pecos Pueblo[6]	Pecos Valley	2100 m	" "	?	?	?	?	?	+	?	?	+•	?	+•	?	+•	+•	+•

Notes: + = present; • = some or all specimens burned; ? = taxa which might have been recoverable using flotation or fine-screeening techniques.

[1] Toll 1982 [2] Toll 1983a [3] Pattison 1968
[4] Struever 1979 [5] Toll 1981 [6] Kidder 1932

evidence of fire-reddening of the underlying clay. Floral material is primarily intrusive (juniper and unburned weed species of low economic utility: #274, 275), although charred corn is present.

Recovery of cultural plant material from PL 30A is generally very poor: corn, found in five locations, is the only material which can reliably be associated with site use. However, this record is not at all surprising, considering the poor conditions for preservation at the site (shallow deposits with considerable rodent activity). More durable charcoal remains provide a record of wood use for fuel and construction material, clearly centering on juniper, with minor utilization of pinyon and saltbush.

Site PL 32A

At this later site, Room 2 is also the earlier of the two masonry rooms composing the small room block. Sample #291 from the southwest corner of the room contained charred juniper debris, yet charcoal from this location was only approximately one-third juniper, and two-thirds saltbush (Tables 5-3 and 5-4). A collection of carbonized grass stems was also recovered in this vicinity (macrobotanical specimen #297). Sample #314 from the southeast room corner netted carbonized seeds of various taxa, including an unidentified grass, and several economic weed species (goosefoot, purslane, and mustard).

An adobe and slab-lined hearth in Room 2 contained some useful economic information. Feature 13 contained charred juniper and ricegrass remains in both samples (#362, 363). Charcoal was also consistently high in saltbush, with some juniper, and cameo appearances by two other local shrubs (sage and rabbitbrush). The function of Feature 11, against the east wall, is not clearly illuminated by floatation data, due to interpretive problems arising from marginal preservation. The feature consists of several flat stones laid in adobe and surrounded by an adobe rim; it has been suggested as a possible seed grinding or other food processing area. Unburned goosefoot seeds were found in both samples (#366, 375). This annual weed was widely utilized throughout the Anasazi and historic Pueblo periods and was often processed by grinding (Castetter 1935:16; Jones 1930:25; Krenetsky 1964:44; Stevenson 1915:66).

A sample from the occupation floor of Room 1 (#198) produced only unburned material, including the ubiquitous juniper debris and seeds of a weed taxon of little or no economic utility (stickseed). Macrobotanical collection #149 came from a depth of only six centimeters, and was associated with rock wall fall. Unburned juniper debris (a staminate cone, and twig and seed fra and six yucca seeds were present. The conte stone-lined ash pit (Feature 10) included co charred tickseed, in addition to several unburn (#259). By contrast, a control sample taken fr south of the pit (#243) held charred ricegrass. C from within the pit was predominantly saltbus juniper and other conifers were the principal nents in the control location.

Several floatation samples were taken from extra features at PL 32A. Feature 2, a charcoal concer (#76), contained numerous carbonized materi cluding many juniper seeds, ricegrass and dr grass and cheno-ams. Unfortunately carbonize of Russian thistle are also present. As this is a r introduced species, there is reason to suspect t only this taxon, but other carbonized specimens location as well, are the product of some recent b event, not related to the Pueblo IV site occupati isolated vessel (#80; floatation sample #89) he juniper twigs. An ash lens just outside the roon (Unit 58; sample #299) contained unburned plar and charcoal that was entirely juniper.

An adobe and masonry structure (approxim meter square) appended to Room 2 may have fun as a storage feature. Obtaining evidence of such again subject to preservation problems. Sample and 400 from the Feature 12 floor were barre feature may be built over midden deposits or dumpings; a subfloor sample (#401) contained c goosefoot, and largely juniper charcoal.

Site PL 32A cultural botanical material is more ext than that recovered at the earlier Puebloan site r Charred specimens include economic weed s (goosefoot, purslane and mustard) and grasses (ric and dropseed). Carbonized juniper seeds may either to fuel or food use of this tree. While ch specimens at PL 32A are still, as a whole, mor juniper than anything else, saltbush is a subs component here and is the dominant element in proveniences. Corn remains at this Pueblo IV s few (found only in Feature 10 of Room 1). carbonized corn is a relatively durable botanic product, it is reasonable to take note of its appearance here as a probable sign of minimal ir ment with corn agriculture (and/or consumpti this site. Finally, the occurrence of carbonized duced species in Feature 2 and in Room 2 (Tab alerts us to the possibility of twentieth century re the site location, potentially contributing other cl materials to the assemblage interpreted as derivin the Pueblo IV occupation.

Discussion And Summary

Plant remains retrieved in this study provide limited documentation of subsistence practices during the two Puebloan periods represented by Sites PL 30A and 32A. Botanical debris points to probable local corn agriculture, and to utilization of several local resource areas. The pinyon-juniper complex was significant as a fuel and probably also a food source. Shrub-grasslands, on foothills and valley alluvial slopes, were also fuel sources. Wild plant products were gathered from rocky, coarse-soiled ridges and slopes (cacti and yucca) and finer-grained soil pockets on mesas and valley bottoms (certain annual weed species). There is no clear-cut evidence that the inhabitants of these sites made use of either high altitude or riparian collecting zones, although both complexes were accessible and provide important complementary resource supplements.

In terms of food products, higher altitudes of the Sandias may have been most significant for faunal resources (deer, porcupine, rabbit). In riparian areas, such as the bosques of the Rio Grande, constantly wet soils support the growth of some versatile food plants that are available throughout the extended growing season from early spring through late fall. Cattail (*Typia latifolia*) and bulrush (*Scirpus acutus* and other species) are two excellent examples. Both produce abundant crops of juicy young shoots in early spring. After the initial crop, bases of bulrush stems can still be eaten raw or cooked and cattail continues to produce smaller numbers of shoots throughout the summer.

As the summer progresses, immature flower spikes of cattail can be cooked and eaten, then mature flowers and finally pollen can be gathered and used as flour. Bulrush pollen and seeds can both be eaten also. Fall brings new growth and bulrush shoots and the best season (highest starch content [Harrington 1967:223]) for use of cattail roots. Rootstocks of both taxa can be utilized at all seasons. Dried and pounded, these can be a substantial source of flour (in case of cattail, roughly equivalent to corn in percentages of fats, proteins and carbohydrates [Harrington 1967:223]). An important factor is that these riparian food plants tend to grow in dense patches and to produce sizeable edible parts, so that significant quantities of food could be collected in a given unit of time. Thus, a collecting trip to the Rio Grande corridor might be worthwhile at any time in the growing season. Such trips might also be important for gathering fuel and construction materials.

From mid-summer to fall, mature stalks and leaves of bulrush cattail, and common reed (*Phragmites communis*) could be stockpiled for basketry, matting and thatch, and for hafting projectile points. In the absence of moisture stress, woody growth of cottonwood, willow and rabbitbrush in riparian areas is characteristically rapid, straight and even-grained. Thus, these woods are produced and replaced with somewhat greater speed and are in demand for special manufacturing purposes (carving, hafting, latillas) and as supplementary firewood.

Examination of the Placitas sites assemblages in the context of other Puebloan sites with access to pinyon-juniper complexes (and often riparian zones as well) indicates some of the ways that preservation has shaped the record of plant utilization at these sites (Table 5-5). Several taxa were common to all or most sites examined. These are taxa with well-documented economic utility, whose natural ranges all overlap at approximately 2000 meters elevation (*Amaranthus*, *Chenopodium*, *Juniperus*, *Pinus edulis* and *Portulaca*).

The distribution of taxa found at fewer sites may well be affected by preservation conditions. The versatile beeweed, for instance, which served both as food and pottery paint, is considerably more common at sites with good preservation. Beeweed seeds found in trash and coprolites at Mesa Verde and Chaco area sites (Donaldson and Toll 1982; Toll n.d.) are largely unburned. Yucca fruits and seeds may survive carbonization more successfully than the fibrous leaves (and hence be more likely to be preserved at open sites), but are not necessarily the most common use-form.

In view of ethnographic accounts, and the composition of botanical assemblages at dry shelters, we can expect that non-food uses (basketry, cordage) constituted a major component of yucca utilization. Only at Nogales Cliff House (Pattison 1968) do we find yucca sandals and cordage remnants; all other instances of yucca recovery in Table 5-5 are of fruit parts. This pattern leads us to suspect that in most cases we are systematically missing evidence of a significant non-food resource, due to differential preservation.

Evidence of use of riparian products is exceedingly limited, and includes recovery of single charred *Scirpus* seeds at Howiri and Nuestra Senora de Dolores pueblos (Toll 1982b). Aside from the occasional appearance of cattail pollen (Madsen 1979; Clary and Cully 1979) both cattail and reed remains have been recovered almost exclusively as macrobotanical specimens from sites with excellent preservation (Sliding Rock in Canyon de Chelly) [Struever 1981]; Bis sa'ani [Donaldson and Toll 1982]).

Amongst cultivars, corn was ubiquitous and beans and squash far less common. Whereas relative proportions of cultivars may be accurate in so far as corn is emphasized, the low profile of squash and beans may be an inaccurate reflection of their actual importance due to factors of differential deposition and preservation (Gasser and Adams 1981; Cutler and Whitaker 1961; Kaplan 1956). In the case of less commonly retrieved taxa, both wild and cultivated, we should remember that sampling error may influence the observed pattern of distribution.

Subsistence at these Placitas sites appears to have relied strongly on agriculture (particularly at PL 30A), backed-up by a variety of wild plant products. These wild food products included perennial species (cacti, grasses, and pinyon) and annual weeds; all are available within a short distance of the sites. A diversity of fuel types was used, including both local conifers (pinyon, juniper) and shrubs (saltbush, rabbitbrush and sage).

Acknowledgements

Floatation samples were processed by Mary Sc Beth S. Crowder performed microscopic sort samples, and inventory and classificati macrobotanical materials, in addition to data tab and typing. Descriptions of individual archeo sites and their environmental settings were provi Charles Haecker and Carol Raish of the Forest S Further geological and floral information was d from survey reports by Reggie Fletcher and I Warren.

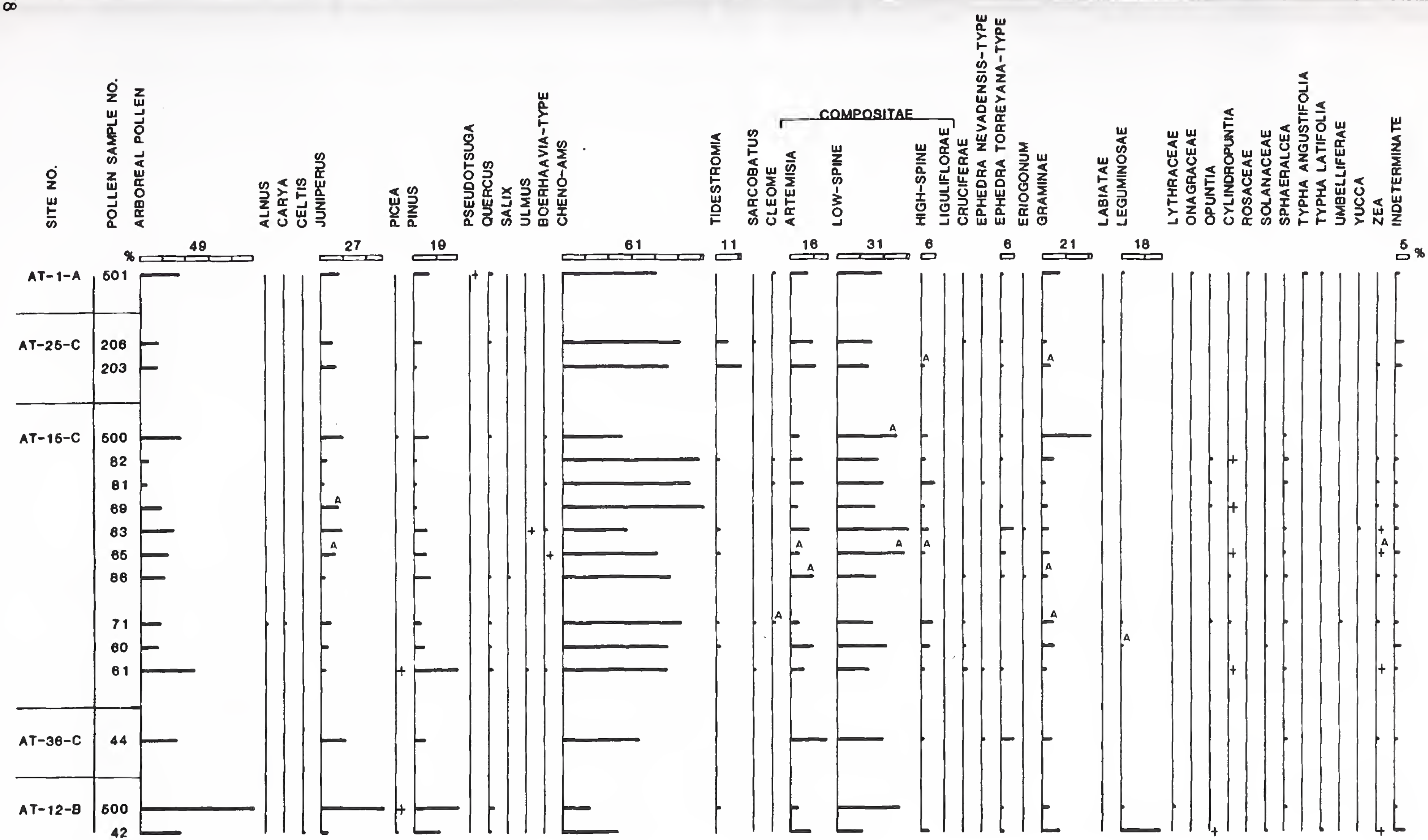


Figure 6-1. Pollen diagrams for selected Atrisco sites.

Chapter 6 • Pollen Analysis Of Atrisco Sites

Linda J.

Introduction

Testing and excavation of five archeological sites within the Atrisco Grant yielded pollen samples which were analyzed to assist in the interpretation of these sites. The sites are located along the Rio Puerco west of Albuquerque. The five sites represent the flat bajada area adjacent to the Rio Puerco, as well as more broken terrain overlooking the river. This pollen analysis will concern itself with both paleoenvironmental and subsistence data.

Site AT 1A is located on a plain east of the Rio Puerco and is composed of two loci. The site appears to have been used over an extended period of time, since En Medio points indicate a Basketmaker II occupation and the ceramics suggest dates of A.D. 1150 to 1300 for Locus 1 (C. Haecker, personal communication, June 1983). A surface hearth was sampled for pollen at this site.

Site AT 25C is situated in a flat bajada eroded by sheetwash along the Rio Puerco, and ceramics date this site to approximately A.D. 600 to 900. The site appears to be a limited activity site for the purpose of core reduction, tool manufacture and food processing. The location of the site within the bajada was suggestive of an agricultural function (C. Haecker, personal communication, June 1983). A single pollen sample was taken from the artifact concentration in an effort to test this interpretation since no direct evidence of agriculture, such as corn remains or agriculture-related tools, was recovered.

Site AT 15C is located at the base of and on the lower slope of a low graveled rise within the Rio Puerco bajada. A test trench at this site exposed six strata, two of which represent occupational levels. Two probable midden deposits were designated Features 1 and 2. The ceramic content at this site indicates that it may be a multicomponent site with a date range of 700 to 1100 A.D. Radiocarbon dates (A.D. 553 and A.D. 833) were obtained from stratum D (C. Haecker, personal communication, June 1983). Pollen samples were taken within several strata from the test trench and also from Features 1 and 2.

Site AT 36C is situated on a dunal ridge to the east of the Rio Puerco. A stained cultural level was encountered below the surface and sampled for pollen. No dates are available at this time for the site.

Site AT 12B is located on the dunal edge of an escarpment overlooking the broken terrain of gravel-capped clay hillocks. This site consists of ground and flaked stone tools and ceramics, and radiocarbon dates range from 750 to 1110 AD (C. Haecker, personal com tion, June 1983). A pollen sample was take metate fragment within the cultural level at t

Methods

Pollen was extracted from soil samples sub Palynological Analysts by the Forest Service. A preparation based on flotation was selected fo of the pollen from the large volume of sand w they were mixed. This particular process was d for extraction of pollen from soils where preserv been less than ideal.

Hydrochloric acid (ten percent) was used to calcium carbonates present in the soil, after w samples were screened through 150 micron me bromide (density 2.0) was used for the flotation All samples received a short (five minutes) trea hot hydrofluoric acid to remove any remaining particles. The samples were then acetolated minutes to remove any extraneous organic m

A light microscope was used to count the pollen of 200 pollen grains per sample at a magnifi 600x. Occasionally there was not sufficien present to obtain a count of 200 grains, so a to of 100 pollen grains was made. Pollen presen these samples was fair to excellent. A com reference collection was used to identify the poll family, genus and species levels, where possib

Pollen aggregates were recorded during identifi the pollen. Aggregates are clumps of a singl pollen, and may be interpreted to represen dispersal over short distances, or the actual i tion of portions of the plant represented archeological setting. Aggregates were include pollen counts as single grains, as is customa presence of aggregates is noted by an "A" a pollen type on the pollen diagram (Fig. 6-1).

Redeposited pre-Quaternary pollen is frequent in studies from western New Mexico (Hall 19 1978, 1982). Unique pre-Quaternary palyno signal the possibility that additional pollen fro that were part of both the pre-Quaternary and nary vegetation may be present. The incidence o pre-Quaternary pollen in these samples is v indicating a low probability for the redeposition types similar to those of the Quaternary. There problems stemming from the redeposition of p ternary pollen are anticipated in the interpretati pollen record from these sites.

Pollen Types Observed

The following types of arboreal pollen were observed from the Atrisco parcel:

Scientific Name	Common Name
Alnus	Alder
Carya	Pecan
Celtis	Hackberry
Juniperus	Juniper
Picea	Spruce
Pinus	Pine
Pseudotsuga	Douglas fir
Quercus	Oak
Salix	Willow
Ulmus	Elm

The following types of non-arboreal pollen were observed from the Atrisco parcel:

Scientific Name	Common Name
Boerhaavia-type	Spiderling, a member of the four-o'clock family
Cheno-ams	Amaranth or pigweed and members of the goosefoot family
Tidestromia	Tidestromia
Sarcobatus	Greasewood
Cleome	Beeweed
Compositae	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, cockle-burr, etc.
High-spine	Includes sunflower, rabbit brush, snakeweed, etc.
Liguliflorae	Includes dandelion and chickory
Cruciferae	Mustard family
Ephedra	Navajo tea
Eriogonum	Buckwheat
Graminae	Grass family
Labiatae	Mint family
Leguminosae	Legume or pea family
Oenothera	Evening primrose
Opuntia	Prickly pear cactus
Cylindropuntia	Cholla cactus
Rosaceae	Rose family
Solanaceae	Potato family
Sphaeralcea	Globe mallow
Typha	Cattail
Umbelliferae	Parsley or carrot family
Yucca	Yucca
Zea	Maize, corn

Discussion

The pollen will be discussed separately by site to facilitate interpretation of the pollen data on a site-by-site basis. Intersite comparisons will be made in the Summary and Conclusions section.

Site AT 1A

This extensive lithic and ceramic scatter is located on the plain on the east side of the Rio Puerco. The vegetation in the vicinity of the site was noted to be desert grassland and scrub (C. Haecker, personal communication, June 1983). The Potential Natural Vegetation Map of New Mexico describes this area as Indian Ricegrass-Galleta Series, which indicates that the area is dominated by grass, principally Indian ricegrass (*Oryzopsis*) and galleta (*Hilaria*). Associated plants include Navajo tea (*Ephedra*), blue grama, sand dropseed, threeawns (Graminae), broom snakeweed (*Gutierrezia*, a high-spine Compositae) and scattered big sagebrush (*Artemisia*). Locus 1 contained a surface hearth that was sampled for pollen (Table 6-1). It contained ceramics which place the age of the site at A.D. 1150 to 1300, although two En Medio points were recovered from the site, suggesting a date of Basketmaker II.

The pollen record from this site includes a sample from the present ground surface, and one from the bottom of a hearth (Feature 1) noted on the surface. Unfortunately, the sample from the bottom of the hearth did not contain sufficient pollen for analysis. The pollen sample from the present ground surface is similar to that expected for this environmental zone. A moderately large frequency of Graminae pollen (eight percent) is present, as are pollen from *Ephedra*, *Artemisia*, and Compositae (Fig. 6-1). The largest single component of the pollen record is Cheno-am pollen (40 percent), which may reflect saltbush, sacaton, and other members of this group. *Pinus* and *Juniperus* pollen are also noted, and are probably wind transported from nearby areas. The only occurrence of *Typha* (cattail) pollen in the Atrisco area is noted in this sample, reflecting the growth of cattails near the Rio Puerco.

Table 6-1. Proveniences of Pollen Samples From Sites AT 1A, AT 25C, AT 15C, AT 36C And AT 12B.

Sample No.	Feature No.	Locus/ Stratum*	Depth in cm. below pgs	Provenience
AT 1A				
501		1	0	Control sample from pgs
114	1	1		Bottom of hearth, insufficient pollen
AT 25C				
206		2	0	Control sample from pgs
203	1	2		Surface artifact concentration extending 15 cm. be-low pgs
AT 15C				
500			0	Control sample from pgs
82		A	5-7	Area of artifacts and charcoal flecks
81		A	40	Contains waste flakes, sherds, bone, shell and c[illegible]n cob
69		AB	40-50	Mixed level, charcoal/ash stained sand with arti[illegible] stratum B is midden
83		C	85-87	Yellow loamy sand, probably colluvial deposition
85		E	62	Surface of stratum E (compacted yellow sand, sc[illegible]tered artifacts) and a portion of stratum C
86		E	80-90	Compacted yellow sand, scattered artifacts
71	1	4		Ash lens containing flakes, sherd and possible b[illegible]e bead
60	1	5		Eroded midden
61	2	5		Eroded midden
AT 36C				
44			0-17	Stained cultural level
AT 12B				
500		1	0	Control from pgs
42			42	Metate wash from cultural level

Note: *Loci are designated by numbers, strata by letters.

Site AT 25C

This widespread scatter of lithics and ceramics is located on the flat bajada on the west side of Rio Puerco. The vegetation in this area is described as a sparse cover of grasses (Graminae) and snakeweed (*Gutierrezia*) (C. Haecker, personal communication, June 1983). It falls within the same general vegetation zone (the Indian Ricegrass-Galleta Series) on the Potential Natural Vegetation Map of New Mexico as site AT 1A. Archeologically, site AT 25C appears to represent a limited activity site dating to approximately A.D. 600 to 800. The primary function of the site has been suggested to be agriculture, based on its location on the bajada. Tools recovered at the site indicate core reduction and tool manufacture also. No agriculture-related tools were recovered, and no macrobotanical remains were observed. Sheet [illegible] erosion appears to have disturbed the site and may [illegible] obliterated ash, charcoal, and macrobotanical re[illegible] (C. Haecker, personal communication, June 1983). [illegible] sampling at this site was undertaken for the sp[illegible] purpose of addressing the question of whether or n[illegible] site was an agricultural one.

The pollen record at this site is limited to a sample [illegible] the present ground surface and one from the subsu[illegible] artifact concentration. The sample from the pr[illegible] ground surface (206) is similar to that of site AT [illegible] many respects (Fig. 6-1). There are fewer plant [illegible] represented in the pollen record at this site, an[illegible] frequency of Graminae pollen is also substantially [illegible] (two percent). This is probably due to the sparseness of vegetation in this area. The sample from the subsurface artifact concentration (203) contains pollen types and frequencies similar to the present ground surface sample, with the exception that *Zea* (maize) pollen was noted in the archeological sample. This suggests that food processing was probably among the activities at this site, and strengthens the argument that the site was agriculturally-based.

Site AT 15C

This site is a sparse lithic and ceramic scatter located near the base of a graveled rise within the Rio Puerco bajada. Low stabilized dunes lie to the east. The vegetation at the site consists of low shrubs, grasses, cacti, and occasional juniper (C. Haecker, personal communication, June 1983). Two features appear to represent the eroded remnants of a midden, and were sampled for pollen. In addition, samples were taken from several strata exposed during excavation.

The pollen sample taken from the present ground surface at this site is different from that of the two previous sites (AT 1A and AT 25C). Little variety was noted in the pollen record, which included a very large quantity of Graminae pollen (19 percent). In addition, the low-spine Compositae were plentiful, and the Cheno-ams depressed (Fig. 6-1).

The subsurface pollen samples contain considerably more Cheno-am pollen than does the present ground surface sample. In addition, there is considerably more variety in the pollen record. The stratigraphy at this site is indicative of cultural levels separated by a mixture of alluvial and cultural debris. Pollen samples were taken only from the mixed alluvial levels. Unfortunately, no samples exist from the cultural levels for comparison or to establish economic utilization of plants at the site.

Stratum A is described as a loosely compacted yellow loamy sand representing post-occupation deposition and soil erosion from the adjacent graveled rise. The pollen samples representing Stratum A (82, 81 and 69) are similar to one another and contain relatively large frequencies of Cheno-am pollen. In addition, these three samples all contain *Opuntia* (prickly pear) pollen and *Zea* (maize) pollen. Two of these samples also contain *Cylindropuntia* (cholla) pollen (82 and 69), while samples 81 and 82 contain *Cleome* pollen. The presence of *Cleome*, *Opuntia*, *Cylindropuntia* and *Zea* pollen in these samples is probably due to the mixture of cultural material with the alluvial soils, and appears to represent utilization of these plants. *Cleome* (beeweed) was often exploited as a source of greens and in making pottery paint (Stevenson 1915; Robbins et al. 1916; Whiting 1939). *Cylindropuntia* (cholla) fruits and buds and *Opuntia* (prickly pear cactus) pads and fruit have been utilized as food by several Pueblo Indian groups (Stevenson 1915; Robbins et al. 1916; Whiting 1939; Nequatewa 1943). *Zea* has been cultivated and utilized widely by Pueblo Indians of the Southwest (Stevenson 1915; Robbins et al. 1916; Cushing 1920; Whiting 1939).

Stratum B is a cultural level that is more compacted and contains charcoal, ceramics, lithics, bone and macrobotanical remains. Unfortunately, no pollen sample was taken from this stratum.

Stratum C is a compacted yellow loamy sand containing pockets of soil similar to Stratum B. There is a decrease in the frequency of artifacts in this level and absence of construction material. Stratum C is presumed to represent colluvial deposition from the adjacent graveled rise during a period of site abandonment. The pollen sample from this stratum (83) is very similar to that of the present ground surface with the exceptions that more *Ephedra* and less Graminae were noted. In addition, *Zea* pollen was also noted in this stratum, again indicating the mixing of cultural material, possibly trash, with the colluvium.

Stratum D represents an occupational level. It is a thick deposition of charcoal and ash with ceramics, lithics and bone remains. No pollen sample was available from this stratum for analysis.

Stratum E was also a compact yellow sand which could not be distinguished from Stratum C when the intervening Stratum D was absent. Two pollen samples were removed from this stratum (85 and 86). The pollen record from these two samples displays moderate frequencies of Cheno-am pollen (41 to 47 percent). *Zea* and *Cylindropuntia* pollen were also noted in both samples. Sample 85 contained three aggregates of *Zea* pollen, while sample 86 contained 1.5 percent *Zea* pollen. The presence of *Zea* pollen is due to mixing of cultural deposits with the native soil. *Cylindropuntia* pollen may be present either as an element of the natural environment or through utilization of this resource. The presence of aggregates of *Artemisia*, low-spine Compositae, and high spine Compositae pollen in sample 85, and *Artemisia* and Graminae pollen in sample 86, probably indicate the growth of these plants at the site at the time this stratum was deposited.

Two features which are thought to represent a midden were encountered and sampled for pollen during excavations at this site. The pollen record from Feature I (samples 71 and 60) is very similar to that obtained from Stratum E. Sample 71 contains 1.5 percent *Zea* pollen, 0.5 percent *Cylindropuntia*, and an aggregate of *Cleome* pollen. These proportions probably indicate utilization of these plants at the site. Leguminosae pollen was also noted in both of the samples from this feature and may represent the exploitation of a member of this family. The Leguminosae pollen was not morphologically similar to *Phaseolus*, the cultivated bean. Little ethnobotanical information is available concerning the use of non-cultivated members of this family. Cushing (1920) notes that a wild pea was occasionally ground and used in the making of bread.

Feature 2 (sample 61) is similar to Feature 1 in pollen content, with the exception that it contains a large quantity of *Pinus* pollen (19 percent) compared to the rest of the samples from this site. *Zea* and *Cylindropuntia* pollen were also noted from this feature.

Comparison of the pollen records from the midden areas and the colluvial strata does not display significant differences between these two types of deposits. The colluvial sediments consistently display evidence of *Zea* pollen and also contain evidence of native plants that were frequently exploited for food, including *Cleome*, *Opuntia* and *Cylindropuntia*. The pollen record from the colluvial deposits suggests that these deposits were mixed with cultural material. The presence of *Zea* pollen throughout the deposits at this site suggests that agriculture was practiced on the bajada. There is also pollen evidence that local plants, including *Cleome*, *Opuntia* and *Cylindropuntia*, were exploited as foods.

The presence of three other pollen types in the sediments from this site deserve comment. *Alnus*, *Carya* and *Ulmus* pollen are present in very small quantities. These trees are not presently part of the local vegetation and *Ulmus* is also not considered to have been part of the native vegetation of the Southwest. These pollen types occur in Upper Cretaceous/Early Tertiary sediments, and are probably present through redeposition.

Site AT 36C

This site is located on a dunal ridge and in an adjacent blowout. Artifactual material consisted of a lithic scatter, fire-cracked rock and bone fragments. An intact living surface was also noted. No ceramics were recovered from the site. At present the site may be interpreted either as an Archaic or Anasazi special-use site. A pollen sample was taken from the deeply stained cultural level that yielded bone and flaked lithics.

The pollen record at this site is represented by a single pollen sample from the stained cultural level. The pollen assemblage is similar to that of site AT 12B, which is located nearby. The most noteworthy element of the pollen record at this site is the presence of *Zea* pollen, which indicates at least the utilization of *Zea* at the
This *Zea* pollen also places the cultural affiliation
site in the Anasazi rather than the Archaic era.

Site AT 12B

This site is located on the dunal edge of an escarpm
overlooking the broken terrain of gravel-capped
hillocks which are drained by erosion channels
intermittent streams. Locus 1 was a scatter of fl
and ground stone tools and sherds eroding down a s
from the escarpment. Radiocarbon dates obtained
this site range from AD 700 to 1110 (C. Hae
personal communication, August 1983). The veget
of the site is composed of grasses (Graminae), y
(*Yucca*) and occasional juniper (*Juniperus*) within
broken terrain below the escarpment.

Pollen samples were taken from the present gro
surface and a metate. The *Juniperus* pollen frequen
the present ground surface sample is considerably hi
than that observed in other samples from this loca
reflecting the proximity to juniper. The metate w
yielded a higher frequency of Cheno-am and Gram
pollen than in the present ground surface, as we
evidence of *Celtis*, high-spine Compositae, *Opu*
Solanaceae, *Typha latifolia* and *Zea* pollen.

Cheno-am seeds are noted to have been ground
flour and mixed with corn meal, or made into pats
steamed (Stevenson 1915; Robbins et al. 1916; Whi
1939). Graminae (grass) seeds are also noted to h
been ground into meal (Robbins et al. 1916; Cusl
1920; Beaglehole 1937; Whiting 1939). Robbins e
(1916) note that *Celtis* berries were eaten. *Typh*
noted to have been chewed as gum (Whiting 1939)
addition, a large quantity of Leguminosae pollen
observed in the metate wash sample. It is not the sa
type of Leguminosae pollen observed in the surf
sample, but is morphologically most like the ge
Cassia. Ethnobotanical literature does not list
plant among those exploited by the modern Pu
Indians, although a type of wild pea is noted to have b
ground and used in making bread (Cushing 1920).
presence of this variety of pollen from edible plants
the metate suggests that a wide variety of foods, b
cultivated and native, may have been ground.

Summary And Conclusions

Pollen analysis at these five sites along the Rio Pue
indicates that the paleoenvironment was generally si
lar to that of today during the periods of occupati
Sampling at four of the sites (AT 1A, AT 25C, AT 36C a
AT 12B) was aimed at defining subsistence questio

such as whether or not agriculture was practiced near the site, and defining the plants utilized at the site. Site AT 15C was sampled stratigraphically to ascertain paleoenvironmental changes and sampled in the midden to collect subsistence data.

All four sites yielding sufficient subsurface pollen for analysis contained *Zea* (maize) pollen. The bajada along the Rio Puerco would have been an excellent location for agricultural fields. The utilization of maize at these sites, both along the bajada and up into the more dissected areas containing dunal ridges, points to the cultivation of this resource at a variety of locations. Pollen evidence also points to the exploitation of numerous native plants. These include Cheno-ams, *Cleome* (beeweed), *Opuntia* (prickly pear), *Cylindropuntia* (cholla), Leguminosae (legume family), Solanaceae (potato family), *Yucca* (yucca) and possibly Compositae and Graminae at AT 15C. The metate wash from AT 12B suggests that a variety of plant remains may have been ground. Pollen present in that sample which may result from the grinding of food items includes *Celtis*, Cheno-ams, high-spine Compositae, Graminae, Leguminosae, *Opuntia*, Solanaceae, and *Typha latifolia*, as well as *Zea*. Additional samples from cultural levels would be necessary to establish average frequencies for the occurrence of these pollen types; such averages are necessary for comparison with the wash sample to interpret the most likely association between foods probably ground and the metate. The present situation provides a list of a wide range of edible plants which were growing near enough to the site or were actually introduced into the site, and which thus may have been processed and utilized at the site.

Pollen analysis of samples from these various sites along the Rio Puerco point to the probable utilization of the bajada for agricultural fields. The archeological descriptions of the sites, which indicate lithic processing and open hearths at each site, appear to indicate that these were, at most, field camps associated with the tending and harvesting of maize in flood-water fields. This compares favorably with the palynological data obtained from field house sites to the west in the Red Mesa Valley, where frequencies of Zea recovered were very small (Gish 1982; Scott 1983a), and also at the Placitas sites northeast of Albuquerque (Scott, this volume), one of which was identified as a field house.

Exploitation of local, native plants was also undertaken at sites AT 15C and AT 12B. Pollen evidence of the probable exploitation of a wide range of plants was noted in the midden and mixed cultural and colluvial sediments from AT 15C, and from a metate wash from AT 12B. The presence of these local native resources may have influenced the location of the campsites within a larger area accessible to the agricultural fields being tended.

Chapter 7 • Pollen Analysis At PL 30A and PL 32A

Linda J. Scott

Introduction

Pollen samples were taken in conjunction with archeological testing at two sites (PL 30A and PL 32A) in the Placitas Sector to assist in the interpretation of these sites. Pollen analysis was undertaken both to study the paleoenvironment and to investigate local subsistence patterns at these sites. The samples analyzed in this study represent both stratigraphic deposits and features.

Sites PL 30A and PL 32A are located close to one another along Las Huertas Creek northwest of the town of Placitas in Sandoval County. Site PL 30A consists of a room block containing two rooms, while PL 32A is a two-room masonry site with an attached bin. The Placitas sector is primarily a bajada formed of materials derived mostly from the Sandia Mountains and the Rio Grande. Although one small mesa is located within the parcel, the majority of the area is hilly and dissected by short draws and arroyos. One-seed juniper is dominant in the area and pinyon pine is found only rarely at the lower elevations; vegetation is sparse. This presently xeric area is susceptible to over-utilization and both species diversity and range conditions are presently poor.

Methods

The methods used in this part of the study are the same as those described in Chapter 6.

Pollen Types Observed

The following types of arboreal pollen were observed from the Atrisco parcel:

Scientific Name	Common Name
Juniperus	Juniper
Pinus	Pine
Pseudotsuga	Douglas fir
Quercus	Oak

The following types of non-arboreal pollen were observed from the Atrisco parcel:

Scientific Name	Common Name
Boerhaavia-type	Spiderling, a member of the four-o'clock family
Campanulaceae	Bellflower
Cheno-ams	Amaranth or pigweed and members of the goosefoot family
Tidestromia	Tidestromia
Sarcobatus	Greasewood
Cleome	Beeweed
Compositae	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, cocklebur, etc.
High-spine	Includes sunflower, rabbit brush, snakeweek, etc.
Liguliflorae	Includes dandelion and chickory
Convolvulaceae	Morning glory family
Cruciferae	Mustard family
Cyperaceae	Sedge family
Ephedra	Navajo tea
Eriogonum	Buckwheat
Euphorbia	Spiurge
Graminae	Grass family
Labiatae	Mint family
Oenothera	Evening primrose
Opuntia	Prickly pear cactus
Cylindropuntia	Cholla cactus
Portulaca	Purselane
Solanaceae	Potato family
Sphaeralcea	Globe mallow
Typha	Cattail
Yucca	Yucca
Zea	Maize, corn

Discussion

The pollen from sites PL 30A and PL 32A will be discussed separately by site to facilitate interpretation of the pollen data on a site-by-site basis. Intersite comparisons will be made in the Summary and Conclusions section.

Site PL 30A

Site PL 30A, a room block, is located in alluvial and colluvial deposits between Las Huertas Creek and an unnamed tributary, both of which flow intermittently. The Rio Grande River, a permanent water source, is located approximately 1.5 miles to the west of the site. A sparse juniper grassland is noted on ridges and across

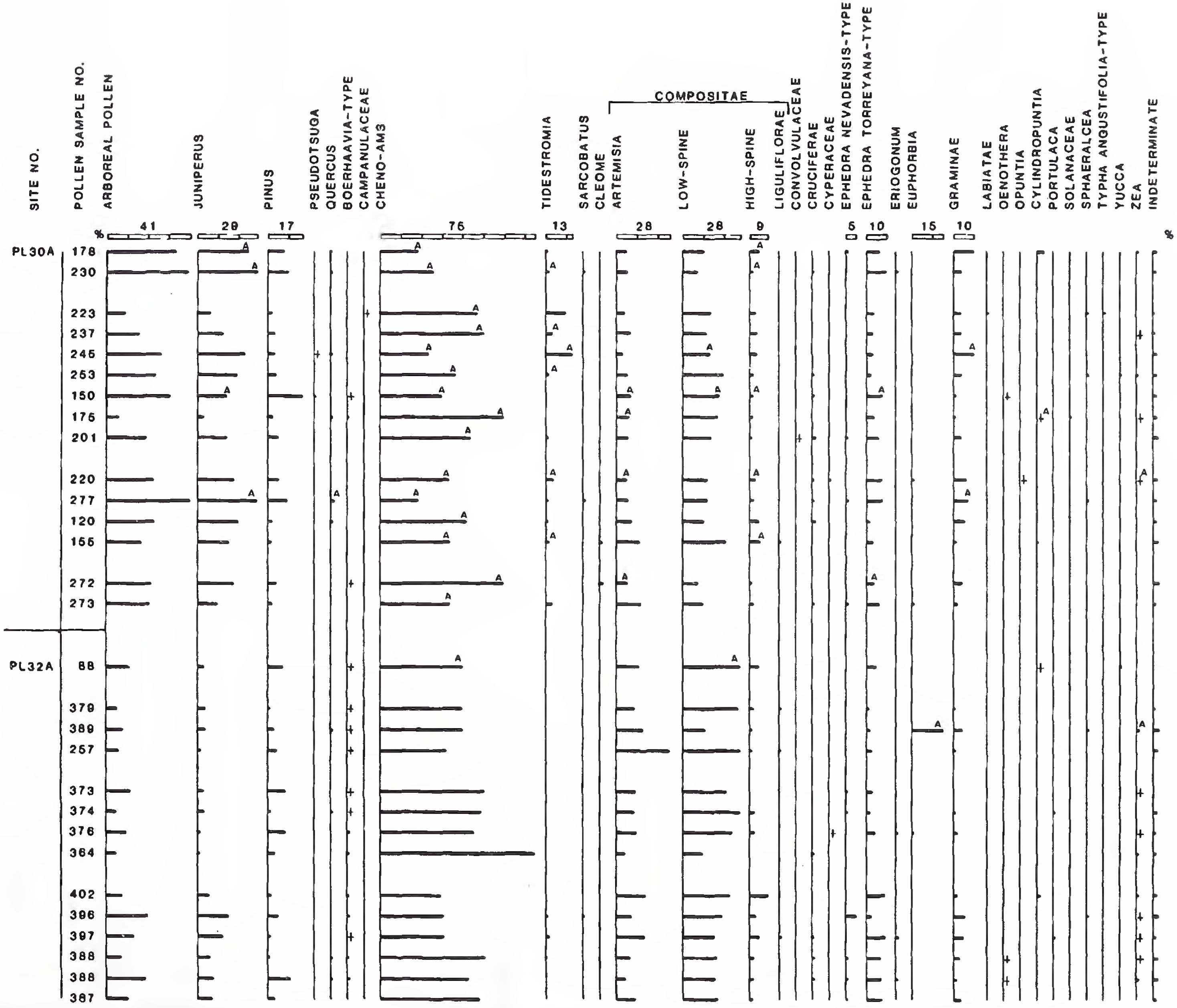


Figure 7-1. Pollen diagram for Placitas Sites PL 30A and PL 32A.

Table 7-1. Proveniences of Pollen Samples from Site PL 30A.

Sample No.	Feature No.	Stratum	Depth in cm. below pgs	Room No.	Provenience
PL 30A					
120	1	B	4-9		Surface outside room block
150		C	29	2	Adobe floor
155		C	9-14		Organic stain
175		B	22	2	Immediately above floor'
178		B	8-18	1	2 cm. above floor
201		B	9-19	2	2 cm. above floor
220		B	21	2	1 cm. above poss. floor or adobe work surface outside S wall
223	7		20	2	Pocket of charcoal within roof fall
230		E	18-33	1	
237	11		20-29	2	Feature fill
245	10		22-30	2	Feature fill
253	13	D		2	Fill between floors
272	14		43		Fill from top of hearth 1.5 m. east of room block
273	14		50		Fill from bottom of hearth 1.5 m. east of room block
277	16	D			Exterior adobe floor or pavement, under wingwall (F. 16)

the valley floor formed by the alluvial and colluvial deposits. Sparse shrubs and grass are noted on gravel ridges and colluvial flats. Vegetation at the site includes Indian ricegrass (*Oryzopsis*), Apache plume (*Fallugia paradoxa*), snakeweed (*Gutierrezia*), cholla (*Cylindropuntia*), thistle (*Cirsium*), rabbitbrush (*Chrysothamnus*), Navajo tea (*Ephedra*), prickly pear cactus (*Opuntia*), aster (*Aster*, a high-spine Compositae), bunch grass (Gramineae), Yucca (*Yucca*) and saltbush (*Atriplex*).

The room block, designated Feature 1, is composed of two rooms and an adjoining ramada, with a wingwall (F.16), and several associated internal and external features. The site yielded radiocarbon dates ranging from A.D. 600 to A.D. 800. Pollen samples were taken from both rooms as well as from the ramada and a hearth outside of the room block (Table 7-1).

The pollen record from PL 30A (Fig. 7-1) is characterized by moderately large frequencies of *Juniperus* pollen (10 to 30 percent), and occasional aggregates of this pollen type, suggesting that juniper grew near the site. Fluctuating quantities of Cheno-am pollen (20 to 60 percent) are accompanied in all samples from this site by aggregates of this pollen type, indicating that a member of the Cheno-am group, possibly saltbush, grew close to the site.

The consistent presence of aggregates of any single pollen type recorded in many samples from a variety of features or locations within a site is suggestive of the growth of that plant in proximity to the site. In this case, it is probable that saltbush (*Atriplex*) was growing at the site during its occupation. *Tidestromia*, also a member of the Cheno-am group, is also noted consistently in the pollen record at this site, and aggregates of this pollen type are frequently noted, which suggests that this plant, too, grew in the immediate vicinity of the site.

Aggregates of *Artemisia* and low-spine Compositae pollen are also noted occasionally in the pollen record, and may be the result of either wind transport of these pollen grains over a very short distance, or the exploitation of these plants within the site. Aggregates of other pollen types (high-spine Compositae, *Ephedra*, Gramineae, *Cylindropuntia* and *Zea*) are noted less frequently in the pollen record, and may be associated more directly with the utilization or exploitation of plants at the site.

Pollen samples from Room 1 were taken from approximately two centimeters above the floor for sample 178 (8 to 18 centimeters below PGS) and 18 to 32 centimeters below PGS for sample 230. The pollen records contained in these two samples do not differ significantly, with the exception that *Zea* pollen and a relatively large frequency of *Cylindropuntia* pollen (four percent) are noted only in the sample taken two centimeters above the floor (178). This pollen is probably representative of economic activity which may either be related to the use of the structure, or to trash accumulation within the structure, depending on the nature of the fill.

Both samples from Room 1 contain aggregates of high-spine Compositae pollen, which may also be related to economic activity in the structure. Maize (*Zea*) was a staple in the Pueblo Indian diet and was processed and cooked in a variety of ways (Stevenson 1915; Robbins et al. 1916; Cushing 1920; Whiting 1939). *Cylindropuntia* (cholla) buds and fruit were also exploited by the Pueblo Indians (Stevenson 1915; Robbins et al. 1916; Whiting 1939; Nequatewa 1943). Various members of the Compositae family, primarily those in the morphological pollen group denoted as high-spine Compositae, are noted to have been used as foods and medicines, or as fuel (rabbitbrush) in hearths (Whiting 1939; Colton 1974).

Room 2 is represented by a series of samples taken from the floor (150) and the fill immediately above the floor (175, 201). Sample 150 contains aggregates of *Ephedra* pollen, which may relate to economic activity. *Ephedra* has been used medicinally and as a beverage by the Pueblo Indians (Stevenson 1915 1915; Robbins et al. 1916; Whiting 1939; Colton 1974). Only sample 175 contains a larger than average quantity of Cheno-am pollen, as well as *Cylindropuntia*, Solanaceae, and *Zea* pollen. These pollen types may be associated with utilization of these resources within this room. Cheno-ams have been a widely exploited resource for greens and for seeds that may be ground into flour. *Atriplex*, a member of the Cheno-am group, was also exploited as a fuel and as an ash to be added to cornmeal (Stevenson 1915; Robbins et al. 1916; Beaglehole 1937; Whiting 1939; Nequatewa 1943).

Features 10 and 11 are located in the east half of Room 2, while Feature 13 is located inside the south wall of Room 2 and borders Feature 11. Feature 10 is a large adobe-lined pit or basin filled with a loamy sand mixed with adobe. There was no evidence of burning in this pit. Feature 11 contained charcoal flecks in its upper fill, but showed no evidence of burning at the bottom. Feature 13 is a bowl-like depression, constructed of adobe, with a flat rock and adobe forming the bottom of the depression.

Sample 237, taken from the fill of Feature 11, contai a larger than average quantity of Cheno-am pollen (percent). In addition, *Zea* pollen was noted in t sample as less than one percent of the total pollen. ' presence of *Zea* pollen and the elevated frequency Cheno-am pollen in this feature may be associated w economic activity. Sample 245, representing the fil Feature 10, contained a larger-than-average quantit *Tidestromia* pollen (13 percent), a type of Cheno- pollen, and Graminae pollen (ten percent). This sam also exhibited aggregates of both *Tidestromia* a Graminae pollen, as well as low-spine Compositae a Cheno-am pollen.

Sample 253 (Feature 13) represents the fill betwe floors and exhibits small quantities of *Sphaeralce* *Yucca Zea* and Cruciferae pollen, which do not appear be part of the background ambient pollen for the si and may, therefore, be indicative of economic activity trash fill. *Sphaeralcea* roots were exploited medicina by the Pueblo Indians (Stevenson 1915; Robbins et 1916; Cushing 1920; Whiting 1939). Several membe of the Cruciferae family are noted to have been utilize The greens may be gathered and cooked to eat or for u in making black pottery paint. Portions of some of t plants and/or roots were also used medicinal (Stevenson 1915; Whiting 1939; Colton 1974).

Sample 223 was taken from the roof fall in this structu and exhibits a small quantity of *Typha* pollen, probab *T. angustifolia*. This pollen type may be present due the use of cattails in the construction of the roof or t processing of cattails as a food on the roof during t occupation. Small quantities of *Sphaeralcea* and Labiata pollen are also noted in the roof fall sample, and may al have been processed on the roof. Members of t Laciatae family were used as potherbs and medicine (Whiting 1939), while *Sphaeralcea* appears to have bee used medicinally (Stevenson 1915; Robbins et al. 191 Whiting 1939; Colton 1974). Utilization of roof areas fo economic activity and the detection of these activit areas have been addressed in pollen studies of a Puebl I pithouse excavated by the Dolores Archeological Proje (Scott 1983a).

Exterior areas at this site were also sampled for poller The floor of the ramada area is represented in sample 220 and 277. Sample 220 contains aggregates of Chenc ams, *Tidestromia*, *Artemisia*, high-spine Composita and *Zea*. The presence of aggregates of some of thes plants may be due to localized wind transportation c pollen, or economic activity within the ramada area. Th presence of *Zea* and an aggregate of *Zea* pollen withi this sample, however, is probably representative o economic activity on the ramada. Also noted is *Opuntia* pollen, which may also be present due to economi activity or presence in the local environment.

Sample 277, also taken on the floor of the ramada, contains a large quantity of, and aggregates of, *Juniperus* pollen, as well as an aggregate of *Quercus* pollen. These aggregates may be present due to utilization of these woods in the construction of the ramada, as fuel in hearths, or from utilization of portions of these plants as foods. *Juniperus* leaves are noted to have been used to make a medicinal tea and the berries were eaten (Stevenson 1915; Robbins et al. 1916; Cushing 1920; Beaglehole 1937; Whiting 1939; Nequatewa 1943; Colton 1974).

In addition, a small quantity of *Sphaeralcea* pollen and aggregates of Graminae pollen were noted in sample 227, both of which may have economic significance. Grass seeds were collected and ground into meal, while brooms were made of the stiffer grasses for sweeping the floor, and cleaning metates and metate boxes. General fill outside the room block was sampled and is represented in sample 120. This sample contains no particularly outstanding pollen indicative of economic activity.

An exterior organic stain in the area outside the room block (155) was also sampled for pollen. This sample contained a small quantity of *Cleome* pollen (one percent), as well as aggregates of Cheno-ams, *Tidestromia* and high-spine Compositae pollen. A single *Cylindropuntia* pollen was also noted. It is possible that the *Cleome* and *Cylindropuntia* pollen are present due to economic activity. *Cleome* is noted to have been exploited for both its seeds and greens, for use both as a food and in making black pottery paint (Stevenson 1915; Robbins et al. 1916; Whiting 1939).

The upper and bottom fill of a hearth (F.14) were sampled and are represented in samples 272 and 273 respectively. Sample 272 from the upper portion of the fill contains a large quantity of Cheno-am pollen, as well as aggregates and an anther fragment of this pollen type. In addition, aggregates of *Artemisia* and *Ephedra* pollen were noted. It is possible that sagebrush and/or saltbush were burned in this hearth, or that sagebrush and/or Navajo tea were used in an economic or medicinal form. *Artemisia* was used to make both a beverage and medicinal tea (Stevenson 1915; Robbins et al. 1916; Whiting 1939). High concentrations of *Ephedra* pollen were noted on the floor of a Pueblo I pithouse (Scott 1983a) to the west of a hearth, where the large quantity of *Ephedra* pollen was considered to be indicative of economic utilization of *Ephedra*.

Site PL 32A

PL 32A is a two room masonry site constructed of unshaped cobbles. The site appears to be a field house of the Pueblo IV period, and is located along a low bench on the north edge of Las Huertas Canyon. The vegetation is similar to that noted for PL 30A, and the water resources are also the same. An assortment of chert and obsidian flakes and a scatter of glaze polychrome sherds were noted at the site.

Room 1 is a highly eroded square room that has been added on to Room 2, which is a square room with slightly rounded corners. A doorway connects Rooms 1 and 2 along the east wall of Room 1. Pollen samples were taken from a variety of locations in the site, including from a duck effigy vessel found to the southeast of the room block and unassociated with other features. Samples were also taken from both Rooms 1 and 2, from the floor, and from within hearth or ash pit areas. In addition, several samples were taken within a storage bin attached to Room 2 (Table 7-2).

The background or ambient pollen at this site is slightly different from that at PL 30A (Fig. 7-1). The frequencies of *Juniperus* pollen are much lower at this site, indicating that juniper did not grow as close to this site in the past as it did to PL 30A. Similar frequencies of Cheno-am pollen were noted at both sites, but aggregates of this pollen type were not noted on a regular basis at PL 32A. Indeed, very few aggregates of any pollen type were noted at this site. The frequencies of *Artemisia* and low-spine Compositae were slightly higher at this site than at PL 30A, indicating that these plants may have been slightly more abundant at PL 32A.

Sample 88, representing the fill of a duck effigy vessel, contains aggregates and an anther fragment of Cheno-ams, as well as aggregates of low-spine Compositae pollen. In addition, both *Cylindropuntia* and *Yucca* pollen were noted within this sample. It is probable that the pollen within the fill of this vessel represents immediate post-occupational deposition at or around the site, particularly in light of the large quantity of low-spine Compositae pollen and the presence of aggregates of this pollen type. Low-spine composites are weedy plants that frequently grow up around sites following their abandonment. This post-occupational deposition may represent primarily elements of the local environment, or may also include pollen associated with trash deposition.

Pollen samples from Room 1 include the floor plaster, represented in sample 377, and two samples from the hearth or ash pit (369 and 257). The floor plaster sample yielded no pollen that might have been associated with economic activity. Sample 257 from the hearth or ash pit also contained no remarkable pollen.

Sample 369, also from the hearth or ash pit, yielded a large quantity of *Euphorbia*-type pollen, as well as an

Table 7-2. Proveniences of Pollen Samples from Site PL 32A.

Sample No.	Feature No.	Level	Depth in cm. below pgs	Room No.	Provenience
PL 32A					
88	5		20		Duck effigy vessel, sample under mouth c vessel, ca. 6m. SE of room block
257	10		44	1	Inside ash pit in NE corner of room
364	13		12	2	Bottom of hearth against room S wall
369	10		44	1	Below and to the side of a large boulder in in NE corner of room
373	11	8	74	2	Adobe collar with upright slabs set against of room
374	11	9	86	2	Fill of feature
376	11	9	86	2	Under flat slab in feature
379	9		40	1	Scrape of adobe surface in SW corner
386	12				Immediately under adobe floor, E end of st bin attached to Room2
387	12				Adobe floor in W end of storage bin
388	12				Adobe floor level, E end of storage bin
396	12				Floor/subfloor deposits, base of storage bi
397	12				Floor/subfloor deposits, E end of storage b
402	12				Floor/subfloor deposits, W end of storage

anther of *Zea* pollen and a small quantity of *Sphaeralcea* pollen. It is possible that the anther fragments of both *Euphorbia* and *Zea* pollen and the small quantity of *Sphaeralcea* pollen are related to economic activity. *Zea* has been noted as a staple of the Pueblo Indians in many ethnobotanical studies. *Sphaeralcea* roots are noted to have been used medicinally by several groups of Pueblo Indians for conditions including broken bones, drawing out pus, and bowel problems in both adults and babies (Stevenson 1915; Robbins et al. 1916; Whiting 1939; Colton 1974). *Euphorbia* was used medicinally for babies who were sick because of failing mother's milk (Whiting 1939), and to increase the flow of milk after childbirth (Stevenson 1915).

It is tempting to interpret the presence of both *Euphorbia* and *Sphaeralcea* pollen in this sample as related to a medical problem, such as an ailing infant or nursing mother, by extrapolation from the ethnographic record. Such an interpretation, however, could not be substantiated.

Room 2 is represented by a sample taken in the collar containing upright slabs set against the ea within Feature 11 (373), another sample (374) from the fill of Feature 11, and a sample taker under a flat slab within Feature 11 (376). In addi sample was taken within Feature 13, which is a l located against the south wall of Room 2.

The samples taken within Feature 11, which is d as an adobe collar and two upright slabs leaning a the east wall of Room 2, are very similar to one ar in their content of Cheno-ams, *Artemisia*, and low- Compositae, which are the major components of samples and appear to represent ambient or ground pollen. Notable is the presence of *Port* pollen in sample 374, taken in the fill of Feature 1 the presence of *Zea* pollen in the other two samples this feature. *Portulaca* is noted to have been exp fresh as a pot herb or for the seeds (Robbins et al. Cushing 1920; Whiting 1939). Evidence of ecor activity within this feature is not overwhelming, exists in the presence of *Portulaca* and *Zea* pollen in Feature 11, which suggests a subsistence-related function for this feature. The sample taken from the hearth in this room contains a very large quantity of Cheno-am pollen and a small quantity of *Zea* pollen. Both pollen types probably indicate economic activity within the hearth.

Six pollen samples were taken from the floor and subfloor units of a storage bin attached to Room 2. All of these samples were taken from fill containing artifacts; thus the samples designated floor and subfloor all represent cultural accumulation. The three samples taken from the subfloor units contain smaller quantities of Cheno-ams than the three samples designated as floor, indicating that Cheno-ams may have been stored in the storage bin. In addition, *Zea* pollen is noted in all samples designated floor and subfloor, with the exception of floor sample 387.

The presence of *Zea*, and possibly also of *Sphaeralcea*, *Portulaca*, *Cylindropuntia* and Cruciferae pollen within these samples, may be associated with storage of vegetal items within this bin. All of these plants were exploited historically as foods and/or medicines by various Pueblo Indian groups. The pollen evidence of storage within this bin is very scant; no large frequencies or aggregates of pollen were noted to differentiate this feature from other floor surfaces and features at the site. While data concerning specific plant utilization within particular features at this site is elusive, it is evident that a variety of native and cultivated plants were exploited.

Summary And Conclusions

Pollen analysis was undertaken to interpret the subsistence base and study the paleoenvironment at two small masonry sites, PL 30A and PL 32A. PL 30A is a two-room room block dating between A.D. 600 and A.D. 800, while PL 32A is a Pueblo IV field house. The pollen record from these sites indicates that the environment was very similar to that of today during occupation. Numerous features, as well as floor plaster, were sampled to collect subsistence data.

A consistently larger quantity of arboreal pollen, primarily juniper, was noted at PL 30A, which was occupied from A.D. 600 to 800, than was observed at PL 32A, which dates to the Pueblo IV period (A.D. 1300 to 1600). This discrepancy may reflect juniper growing at site PL 30A at the time of occupation. Slight variation is also noted in the pine pollen frequencies between the two sites, but they do not appear to be significant. There is no indication in the pollen record from these two sites to suggest that the climate differed significantly between the two periods of occupation represented.

Paleoenvironmental reconstructions from Chaco Canyon (Hall 1977) indicate that the climate at Chaco Canyon was drier than the present at ca. A.D. 600 to 800, and was similar to the present at A.D. 1300 to 1600. This would be expected to produce a lower arboreal pollen frequency at site PL 30A than at PL 32A, the opposite of the condition noted. Paleoenvironmental investigations in the San Juan Mountains of southern Colorado (Petersen 1981), however, characterized both periods as cooler and drier than today.

A study of past sediments representing Pueblo II/III and post-occupational deposits in a reservoir in Mesa Verde (Wyckoff 1977) indicates that during the immediate post-occupation period trees invaded fields that had been cleared for cultivation. Clearing of forested areas or simply an exploitation of juniper during or shortly before the occupation of PL 32A may be responsible for the discrepancy in juniper pollen frequencies noted between the two periods of occupation. Examination of samples from the present ground surface at both sites could serve to eliminate or verify the possibility of differential wind transport as an explanation for the disparate juniper pollen.

Evidence of the utilization of native plants at these sites is rather scarce. The large quantities of aggregates of several pollen types at PL 30A appear to be associated with the specific vegetation in the immediate vicinity of the site. This may be true primarily for the aggregates of *Juniperus*, Cheno-ams, *Tidestromia*, *Artemisia*, and low-spine Compositae. The aggregates of high-spine Compositae and *Cylindropuntia* are from insect pollinated plants, and are not expected to travel even small distances on the wind. It is, therefore, more probable that these aggregates were introduced by human activity. The aggregate of *Zea* pollen observed on an exterior floor surface was probably also introduced through human activity, since *Zea* pollen is quite heavy and does not travel long distances on the wind. The aggregates of Graminae and *Ephedra* occurred only occasionally, and are interpreted as being subsistence-related.

The pollen record also suggests that Cheno-ams were exploited. The highest frequencies of Cheno-am pollen were noted on the floor of Room 2 and in the upper fill of a hearth located east of the room block. Aggregates of Cheno-am pollen are abundant throughout this site and have, therefore, not been used in the interpretation of this resource as a subsistence item. While the larger frequencies of Cheno-am pollen suggest utilization of this resource at the site, the gradually fluctuating quantities of Cheno-am pollen throughout the site make interpretation of utilization by provenience very tenuous. Cruciferae pollen is noted in several floor samples within Room 2, as well as in exterior floor samples. The relationship of the location of these samples to subsistence-related features should be examined, as the presence of Cruciferae pollen in these contexts may be economic. *Zea* pollen is distributed throughout the site, appearing in both rooms, as well as on an exterior floor.

Aggregates rarely occur in the pollen record at PL 32A. In the sample from the duck effigy vessel (88) the aggregates of Cheno-ams and low spine Compositae appear to be representative of local vegetation, possibly from a post-occupational situation. The aggregates of *Euphorbia* and *Zea* pollen noted in a hearth or ash pit in Room 1 appear to be related to subsistence activity. The elevated Gramineae frequency and the presence of *Sphaeralcea* pollen in this hearth or ash pit sample may also be culturally related. A large quantity of Cheno-am pollen was observed in a hearth sample from Room 2, suggesting utilization of this resource. *Portulaca* pollen was observed in two samples, in the fill of a fea Room 2 and in the storage bin. This pollen type and its presence is probably indicative of the util and storage of the greens and/or seeds of this p

Again, *Zea* (maize) is the only cultivated plant n the pollen record. Although it occurs in small fre cies, it is widely distributed at this site. *Zea* po noted in hearths and on the floor of both rooms, a as in the storage bin. This pattern of limited qua of pollen from cultivated plants, particularly Z similar to that observed at field house sites in Red Valley near Prewitt (Gish 1982; Scott 1983b) as w at small sites along the Rio Puerco (Scott, this vol The variety of economic pollen at both sites ind that both native and cultivated plants contributed economy of the inhabitants of these sites.

Chapter 8 • Atrisco Sector Faunal Remains

Jack B. Bertram

Methods

All vertebrate faunal remains reported here were diagnosed to the limit of reliability using the comparative collections of the Museum of Southwestern Biology, University of New Mexico. Invertebrate remains were compared to the diagnosed archeological shell held by the Chaco Center, National Park Service. All observations are detailed in Appendix 8-1, organized by site number, field specimen number and standard taxonomic sequence.

Although all specimens were compared to known materials, the reliability of identification was variable, depending on the character of the specimen. In Appendix 8-1, definite identifications are shown without comment. Highly probable identifications are shown with "ref" (referred to) prefixed to the less-than-certain term. Likely uncertain identifications, based primarily on size, are shown prefixed by "so" (size of).

Unidentified rodents were classified as "small" (no larger than Ord's Kangaroo Rat), "medium" (no larger than Prairie Dog), and "large." Where no information other than fragment thickness and shape were available, a size range was specified. "Small mammals" include those of cottontail-size or smaller; "medium mammals" are those of jackrabbit-size or larger, but smaller than a small mature domestic sheep. In general, "large mammals" are those of body weight greater than 40 kilograms; in the Southwest, these are almost invariably referable to artiodactyl if intensively studied.

Larger forms, if sufficiently fragmented, will produce some fragments which are classified in a smaller size category. This is especially likely if very young animals are studied. The different texture of bone from very young mammals generally suggests their appropriate inclusion in a larger size category than that implied by observable size and other morphology.

Where more than one piece from a given provenience met a single description, this fact is indicated in Appendix 8-1, COUNT. Where pieces appeared to represent a single specimen, broken in recovery, an asterisk (*) precedes the count.

Where possible, all elements were classified according to their skeletal "element," "portion" of that element represented and "laterality." Abbreviations for the first two variables are defined in Appendix 8-1. Laterality is indicated as left (L), right (R), uncertain (?), or irrelevant (-).

Wherever possible, "age, size, sex" and ephiphyseal "fusion" were specified; in general the most exact designation was chosen. Thus "female" usually implies "mature and of small to medium size." Where more than one fusion center was visible, the most anterior/proximal is listed first.

Burning was characterized in detail by "hardness, color and completeness." Where burning was incomplete or mild, or where color and texture changes so indicated, "roasting" was reported.

The condition of specimens is reported in detail. Definite characteristics such as "gnawing" (by agent), scatological "smoothing" and rounding, the color and texture changes induced by ground-water "leaching," and the diagnostic effects of "root-etching" and "surface-exposure" weathering are noted. Where more non-specific textural or structural changes were noted, specimens are characterized as "weathered, eroded, or friable." Human modification was noted. Anomalies or other striking observations are included in Appendix 8-1 as "Notes."

The minimum number of individuals (MNI) was estimated according to standard approaches (Chaplin 1971). Computations were performed on those pieces sharing a field specimen number (Tables 8-1, 8-2 and 8-3). Where clearly suggested by excavation documentation, MNI was also calculated for pooled collections (see Sites section, page 190). Estimates in all cases were based on all data available; i.e., fusion, texture, etc., were considered, as well as element redundancy.

Taxa Recovered

A variety of fauna was recovered from the 15 Atrisco sites studied. Taxa definitely present are listed below.

Mammals

Heteromyidae:	
Dipodomys ordii	Ord's Kangaroo Rat
Geomyidae:	
Thomomys sp.	Pocket Gopher
Cricetidae:	
Neotoma sp.	Wood rat
Leporidae:	
Lepus ref *californicus*	Blacktail Jackrabbit
Sylvilagus sp.	Cottontail
Cervidae/bovidae:	
Odocileus/O.canadensis	Deer or Bighorn
Bovidae:	
Ovis aries	Domestic sheep
Bos/Bison	Cow/buffalo

Mollusca

Haliotus ref *cracherodii*	Abalone
Oliva ref *incrassata*	Olive shell
Olivella ref *dama*	Olivella, lesser olive shell

The following is a brief discussion of observations and information relevant to the assessment of significance for the forms reported.

***D.ordii*:** Bailey (1931) noted that Ord's Kangaroo rats store useful caches of seeds which were viewed as emergency larders by local Indians. He also indicated that the small rodents were easily snared. The one specimen recovered (AT 12B16) had probably been roasted.

***Thomomys* sp.:** The four specimens (AT 15C1 appear to represent an immature individual, weat but not burned. Although geomyid gophers were by the Anasazi, their presence in numbers in would suggest either sheet-flood irrigation techn or intrusiveness (see Bertram and Draper [1983] detailed discussion). The present small sample's biguous condition permits neither inference.

***Neotoma* sp.:** Wood rats were recovered fror proveniences (AT 12B32, 41; AT 15C27, 32, 3 31C376). Of these, some materials from four p nlences exhibited roasting or burning, while remaining specimens appeared generally to be arc logical in character. Roasting or burning was obse on hind limb elements and on two of four man fragments. Wood rats of several species migh

Table 8-1. Atrisco Sites MNI.

Site No.	FS No.	Sm. Sciurid	Sm. Cricetid	Lepus	Sylvilagus	Lagomorph	Indet. Sm. Mammal	Eggshell (Turkey?)	Unidentified	Minim Total
AT IA	25				?					1
	31						1			1
	50			1						1
	55						1			1
	56				1					1
	58				?					1
	59			1		1	1			1
	63				1		1			1
	64				1					1
	104	1	?	1	1	1	1			3/4
	105			1	?					1
	113				1		1			1
	123					?				1
	126						1			1
	135						1			1
	192			?						1
AT 3B	5							1		1
	55							1		1
	60							1		1
	65			?						1
AT 3C	Survey			1						1
AT 5B	5								1	1
AT 7C	Survey						?			1
AT 11C	5								1	1
	17								1	1
	18								1	1

Table 8-2. Additional Atrisco Sites MNI.

Site No.	FS No.	D. ordii	Med. rodent	Sylvilagus	Ovis aries	Indet. Sm. Mammal	Olivella	Seashell?	Heteromyid	Rodent	Lagomorph	Ovicap/Odocoil	Indet. Lg. Mammal	Oliva	Indeterminate	Neotoma	Lepus	Bos/Bison	Artiodactyl	Herpetofauna	Haliotus	Minimum Total Taxa
AT 12B	12										1											1
	16	1					1	1	1					1								3
	30						?	?	1													1
	32		1	1	1	1	1	1	1													4
	33																				1	1
	38							1														1
	39						?	1						1								1
	40						?															1
	41			1										1								1
AT 18C*	1																			?		1
	23													1								1
	24						1							1		1						2
AT 21C	24									1												1
AT 23C	1						1	1			1	1	1		1							3
AT 31C	230																1					1
	236-1															1					1	
	273-1																1				1	
	375-1					1															1	
	376			1		2/3		2	1					1								3
AT 36C	9																				1	1
	38						1		1													1
	39													1								1
	40							?														1
	41													1								1
	43								?													1
AT 37C	72							1														1
AT 38C	13														1							1
	17								?					?					1			3

*Site AT 15C appears on a separate listing (Table 8-3).

expected in these sites (Findley et al. 1975); both they and their seed caches are common human prey (Bailey 1931).

Lagomorpha: Those familiar with the Southwest will be unsurprised at the dominance of jackrabbit and cottontail in the Atrisco sites. Only sites AT 5B and AT 11C lack definite or possible lagomorph remains. The local riverine habitats and steppe grass/shrublands ensure that one or both forms would have been accessible year-round near every site.

Virtually every element of the lagomorph skeleton was observed in these collections, only vertebrae being very uncommon. Most elements had burned examples. In most sites, fire-modified specimens were dominant.

Sites AT 15C and AT 31C were exceptional in this regard, due to both accidents of preservation and to the scale of excavation at these two midden sites.

Indeterminate small mammals (ISM) probably include a small sciurid (antelope-squirrel) and a small cricetid (deer mouse), both very eroded, from AT 1A. There was a heteromyid tooth from AT 12B. Other ISM materials were distributed generally; the great bulk undoubtedly are referable on statistical grounds to the rabbits.

Artiodactyla: Bovids and cervids were relatively rare in the collections from Atrisco. No antelope materials were seen. The only definite forms were *Ovis aries* (domestic sheep) and *Bos/Bison* (cow or buffalo), found in surface context at AT 12B, AT 21C and AT 23C. Deer or domestic sheep were also present at AT 23C1. An ambiguous humerus, referable insecurely to deer or bighorn sheep, was found in archeological context at AT 15C21. Adjacent provenience AT 15C22 yielded a probable deer metatarsal. Large forms, probably artiodactyl, occurred as expected at AT 15C and AT 23C but were also noticed at AT 38C17.

Mollusca: Seashell was found at AT 18C, AT 31C, (*Oliva* and *Olivella*) and AT 38C (abalone). Materials from AT 5B, and possibly AT 11C, are probably shell; all except the AT 11C materials are apparently artifactual. The AT 31C pieces are excellent ornaments.

Bird material from these sites is limited to eggshell fragments from AT 3B. These appear to be consistent with turkey.

The Sites

Fifteen sites producing fauna were included in this study. Of these, eight had samples of less than ten pieces. The remaining sites had potentially meaningful samples; they may be classified as:

1. Undated lithic site (AT 36C).
2. Early sites with great possible time depth, having midden or structures (AT 1A, AT 15C, AT 31C).
3. Pueblo III assemblage, no evident structure (AT 18C).
4. Pueblo IV assemblage, burned structure (AT 12B).
5. Historic hearth (AT 23C).

The less meaningful sites will be discussed in numerical order. A discussion of the classified sites will follow, in classificatory order.

Site AT 3B is a ceramic and lithic scatter, with assc cobble hearth, dating to about 1300 A.D. The deflated. The total faunal assemblage (nine consisted of eight fragments of eggshell and one ja bit-sized burned fragment.

Site AT 3C is a complex of structural rubble, pr representing some three jacales, dated as Basket III/Pueblo I. The total faunal complement is one a logical jackrabbit humerus fragment having evide recent exposure due to deflation. The piece is unbu

Site AT 5B is a lithic and groundstone scatter on a ridge, probably deflated. The sole piece recove unidentified. Of shell, tooth, or fossil, it may have reworked as an artifact.

Site AT 7C is a lithic and ceramic scatter dating 1050 to 1400 A.D. The material recovered was un tifiable, resembling the moderately-replaced verte fossils common in the Plio-Pleistocene Santa Fe gr

Site AT 21C is a hearth with ceramic and lithic sca dating about 1300 A.D. The only fauna recovered large-bodied tibia fragment exhibiting rodent-gna and the rounding and mellowing associated with s blasting or dog-licking.

Site AT 37C is a probable late Basket Maker III s ment. A roasted, leached cottontail premolar frag was collected.

Site AT 38C is a partly-deflated complex of scatters features, dating about 1000 A.D. Eight pieces recovered. These include two abalone fragment rabbit-sized fragment and five large-mammal fragm All bones were burned to hard-white.

AT 36C is an undated lithic scatter and buried li surface. One specimen (#9) was collected from surface; it remains unidentified. All materials appe relate to the buried surface and its cultural fill. All three cancellous fragments were burned or roas Jackrabbit was positively identified; elements fo were a distal forelimb, a hind foot and perhaps a foref The animal was mature and large enough to be un tainly assignable to the relatively small *L. californ* although the larger *L. townsendi* and the much large *alleni* cannot be ruled out. Should AT 36C prove b datable and early, its potential for palaeoenvironme data recovery might be high, as both the larger hares currently excluded from west-central New Mexico thermal limitation.

AT 1A is composed of two lithic scatters having spa ceramics, the southern of which overlies a buried oc pation surface. Dates for the two loci together ra from Basket Maker III to Pueblo III with the earliest and latest dates originating in the southern component. Apparently, all samples save #104 and #105 originated from the surface of the southern component or from near-surface. Samples 104-5 appear to relate to the deeper layer and will be analyzed separately.

Surface and near-surface fauna included cottontail and jackrabbit along with small remains probably referable to these two forms. The great majority of materials were variably heat-affected. One fragment may have been worked. Most portions of the body, excluding vertebrae and ribs, were present. A specimen from #58 may bear a cut mark. Calcium deposits were observed on pieces in #59; all samples showed evidence of leaching or bone destruction by erosive processes. It is likely that unburned materials did not survive. Sixty-nine pieces were counted.

The deep level of AT 1A was similar to the upper level. It contained 81 pieces. At least one piece each of jackrabbit and cottontail were noted, along with a small probable ground squirrel and a possible cricetid mouse. These uncertain taxa were represented by unburned but deeply eroded pieces, while a few cottontail pieces were less eroded but clearly leached. Most of the sample was burned. Only the porcelainized pieces escaped leaching. The lower unit shows slightly better preservation than the upper, but all AT 1A samples are clearly biased due to post-depositional attrition of unburned bone. One suspects that a considerable period of time elapsed between the two occupations; had the second followed closely on the first, the lower unit should have contained better-preserved samples (see AT 15C and AT 31C discussions).

AT 15C provided the largest (500 pieces) and best-preserved assemblage in the Atrisco collections, but not the most diverse. Some 280 pieces (56 percent) recovered were unburned. The assemblage is dominated by lagomorph remains.

The site is a deeply buried midden/habitation having some three depositional components reflecting occupations. Stratum B is dated ceramically at ca. 700 to 1100 A.D., while stratum D provided two radiocarbon dates in the 525 to 835 A.D. range. Analyses will be presented by stratum as defined in the Forest Service field notes and preliminary reports for the site (C. Raish, personal communication).

Stratum A (115 pieces) occupied roughly the upper half meter of the site deposit; it is represented by samples 7, 8, 10, 15, 19-21, 27, 29, 30, 40-42 and 53. Surface collected materials were included in this group. Taxa and MNI recovered were: jackrabbit (one adult), cottontail (one adult), lagomorph (one young or very young), pack rat (one full-sized), large mammal (artiodatctyl?) and medium mammal. Most material was burned, friable and heavily leached.

Stratum B (roughly 0.5 to 0.9 meters below datum) probably is composed of midden and jacal debris; it is represented by samples 22-24, 26, 32 and 44-47. Some 210 pieces were recorded. Taxa and MNI recovered were jackrabbit (one adolescent, one adult and one of uncertain age), cottontail (one adult and one or two of uncertain age), wood rat (one adult) and artiodactyl or large mammal. Burning was consistently much less common than in Stratum A and proportionally more elements were roasted. Unburned and roasted or lightly burned pieces displayed root-etching and leaching; erosion and occasional gastric polish suggest the disposal of faeces. Lagomorph materials notably lacked femora, humeri and vertebrae, although ribs were recovered.

Stratum C (variably 0.5 to 1.1 meters below datum) appears to represent a colluvial event complex. Some 76 pieces were recovered from samples 11, 25, 33-35 and 48. Taxa and MNI from this stratum may pertain to Strata B and D; recovered were jackrabbit (one adult or uncertain age), cottontail (one young and one adult or uncertain), wood rat (one uncertain) and probable artiodactyl. Burning was rare, but root-etching was common. A few pieces were very weathered. The assemblage is not very different from the overlying materials, except in the lack of small foot bones probably lost to attrition in situ.

Stratum D (0.8 to 0.9 M.BD) was interpreted by the excavator as a living surface; it is represented (69 pieces) by samples 36 and 49. Sample 12 is reported as mixed Strata D and E; it was excluded from all counts. Taxa and MNI represented were jackrabbit (one adult), cottontail (one young, one adolescent, and one adult), artiodactyl and large mammal. Burning was rare, but leaching and erosion were widespread, as in Stratum C. This level probably was deposited and covered rather quickly, but never completely sealed by impermeable overburden. Bone condition strongly implies that either Stratum D never occupied a zone of high root activity or that subsequent events obliterated almost all root-etching.

Stratum E (0.85 to 1.0 M.BD) graded into stratum C but overlay occupation surface E/F. It is represented (26 pieces) by FS numbers 37 and 50, as well as by an undetermined portion of FS 12 (five pieces). Taxa found were jackrabbit (one adolescent or uncertain) and cottontail (one uncertain or adult). Burning or roasting were rare; although this deposit underlay Stratum D, which lacked root-etching, the bone materials display both root-etching and erosion due to soil chemistry. Remarkably, fragile tiny bones such as a lagomorph fibulary from AT 15C37 were preserved. Probably the

Table 8-3. Site AT 15C MNI.

FS No.	Sm/Med. Sciurid	Thomomys	Neotoma	Med. Rodent	Lepus	Sylvilagus	Lagomorph	O. canadensis/ odocoileus	Artiodactyl	Indet. Sm. Mammal	Indet. Med. Mammal	Indet. Lg. Mammal	Indeterminate	Minimum
7											1			1
8							1						1	1
10						1								1
11		1			1		1		?	1				3
12						1					1			1
15											1			1
19						?					?	?		2
20					1	1	?					1		3
21					1	1	1	1				1		3
22					2	1			?	1		1		3
23					?	1				1		1		2
24					1	1	1							2
25					1	?			1					2
26						1								1
27			1			?								1/[illegible]
29							?							1
30						?								1
32			1		1	1	1			1				3
33			1		1	1				1				3
34						1				1				1
35							1							1
36					1	2	1		1				1	3
37					1	1	1			1				2
40										1				1
41										1				1
42						?	?			1				1
44						1				1			1	2
45	1				1	1				1				3
46						1	1							1
47						1	1			1				1
48			1	1	1		1			1				2
49					1	3	1			1				2
50					1	1				1				2
53						1								1

compact alkaline deposits of Stratum D protected Stratum E from acid leaching. Femora were noted in Stratum E, as were ulnae, phalanges and metapodials.

Overall, Site AT 15C appears to be well preserved, especially in the lower deposits. Taphonomic processes strongly impacted only the superficial strata. Recovery on and in surfaces overlain by compact alkaline deposits may be excellent. Given the age of these deposits and the wealth of material recovered, the lack of identifiable and/or antelope is remarkable. It suggests frugal u rare artiodactyl resources, just as in much later Ana occupations of high population density (see Bert and Draper [1983] for a comparative survey of Southern San Juan Basin).

Atrisco AT 31C is an extensive lithic and ceramic sc with buried midden, ceramically dated to A.D. 50

875. Materials from this site include surface samples (FS numbers 230, 236, 273 and 375) as well as a subsurface test of a "hearth" (midden), FS number 376. Surface materials include a friable jackrabbit scapula, three pieces of oceanic olive shell jewelry and a locally common fossil shell. Subsurface test number 376 produced a diverse and sizeable (149 pieces) collection of jackrabbits (2/3 adults), cottontail (one young, one adult) and pack rat (one adult). Most lagomorph elements were represented, including vertebrae. Burning was rare, but roasting occurred on elements from all body parts. Leaching and root-etching were common. Preservation was good, considering the evidence that these materials were either never sealed or were recently stripped by erosion of any impermeable capping strata.

Atrisco AT 18C is a late Pueblo III assemblage of lithics and ceramics, in dunal context. The faunal assemblage is composed of seven pieces of shell, one of which exhibits edge polish (all from surface collections), one eroded small mammal bone fragment from Unit B and 24 pieces from Unit A. These last included jackrabbit (two vertebral fragments), small mammal (21 fragments) and a snake vertebra. All appear to be roasted but, being in dunal context, may be merely stained. All are root-etched; one piece may be faecal.

Atrisco AT 12B is a Pueblo IV structure with associated artifacts. Sample FS number 12 is a surface collection; all other samples were taken from Stratum B, burned structural remains. This stratum produced samples totaling some 50 pieces. Taxa recognized from Stratum B were jackrabbit (one adult), cottontail (one adult), Ord's Kangaroo rat (one adult) and wood rat (one adult). All taxa evidenced burning or roasting; pieces were noted that were both relatively fresh and friable, and root-etched or eroded. The variability of this collection is undoubtedly due in part to the mixed sand, clay, terracotta and ash matrix; no clearly intrusive materials were found.

The surface sample AT 12B12 is a probable domestic sheep radius from a large lamb. It shows surface exposure.

Atrisco AT 23C is a hearth, exposed in a road cut and associated with historic artifacts. Of 35 pieces, all but three are most easily referable to domestic sheep, although deer may also be present. The remaining pieces are jackrabbit (one split tarsal) and cottontail (one radius fragment). All materials were either roasted or burned in flesh (Binford 1967).

Shell Ornaments

Ornaments fabricated from seashell were found at perhaps six Atrisco sites (see site descriptions). A least three pieces, all from surface context at AT 31C, are relatively intact ornaments. *Olivella* beads were found in AT 31C230 and 236. They differed only in degree of being intact. In both cases, the shell had been made into a bead by grinding the posterior end away. FS number 230 remains intact; FS number 236 lacks part of the anterior end.

A pendant carved of *Oliva* shell was found in AT 31C273. Roughly one half of the anterior end of the shell was used, the shell being halved along two or three axes through center. A design suggestive of a landscape was incised into the outer face of the piece, and the anterior end was drilled for suspension. The resulting hole is approximately one millimeter in diameter and exhibits wear polish. No inferences regarding rough-out or drilling technology are advanced; the incision appears to have been carried out by using stone flakes having very acute edge angles at their tips, rather than by using more burin- or chisel-like tools. Fine abrasions evidently overlie the incised pattern; these may be due to post-disposal damage.

Atrisco Summary

Faunal collections from fifteen Atrisco-area sites were analyzed. Of these, eight sites yielded unreliably small samples. The remaining seven sites included one of possible paleoenvironmental value (AT 36C) and three or four having potential for good faunal preservation (AT 12B, AT 15C, AT 31C and possibly AT 1A).

Definite or possible shell artifacts were encountered in six sites (AT 3B, AT 5B, AT 11C, AT 18C, AT 31C and AT 38C). Well preserved and attractive shell beads were noted at AT 31C. Other than seashell, no exotic fauna were noted. All precontact samples show rather low frequencies and very intensive processing of large forms, implying a rather high human population in the area extending back to the earliest Puebloan occupation.

Ch

Met

All ve
osc
colle
Univ
comp
Nati

Tabl

S N
33
32
4
5

Chapter 9 • Faunal Remains: PL 40A and 50A

Jack B. Bertram

Methods

All vertebrate skeletal remains reported here were diagnosed to the limit of reliability using the comparative collections of the Museum of Southwestern Biology, University of New Mexico. Invertebrate remains were compared to the collections held by the Chaco Center, National Park Service, University of New Mexico. All observations are detailed in Table 9-1, organized by Site, Field Specimen number and taxon.

Although all specimens were compared directly to known materials, the reliability of identification depended on the condition of each specimen. In Table 9-1, definite identifications are shown without comment, likely identifications are shown with a question mark, and very

Table 9-1. Placitas Data Listings and Observations.

Site No.	FS No.	Taxon	#	Element	Port.	Lat.	Age Size/Fusl.	Burning	Condition	Notes
39A	157	SYLV	*2	TIB	D	L	F		v.FR	
32A	126	SB/M	1	LB	S	?	?		ER/GP	
	158	SB/M	1	LB	S	?	?	V:Grey	m.ER	1
	208	S/M.RODENT	1	MAX	A	L	F		FR	1
	245	LEPUS	1	PHIP3	C	?	F		m.ER	
	249	NEOTOMA	1	HUM	D+S	L	?		RE.ER	
40A	65	so.SYLV	1	TIB?	SF	?	?		GP	
		S.RODENT	2	SKUL?	PF	?	N/Y		v.FR	
		MUSSEL?	4	SHEL	-	-	-		AP	2
50A	2	ILM(HUMAN?)	5	CANC	F	?	?		ER.RE	3
			7	See 40A FS 65 MUSSEL? Interior slip says PL 50A.7, exterior PL 40A.65						

*Thought to represent one piece broken in excavation

Taxon Abbreviations

B/M	bird or mammal
I	indeterminate
L	Large
M	medium or mammal (see context)
S/M	small or medium
S	small
?	moderate certainty

Portion Abbreviations

A	anterior
C	complete
D	distal
D+S	distal and shaft
F	fragment
P	proximal
S	shaft

Element Condition Abbreviations

AP	artificial polish
FR	fresh
m	moderate to light
v	very
ER	eroded
CP	gastric polish or evidence of scat
RE	Root-Etched

Element Abbreviations

CALC	calcaneum
HUM	humerus
LB	long bone
MAX	maxilla
PH(#PorM{#})	phalanx, joint, toe or manus, digit (if known)
SHEL	shell
SKUL	skull
TIB	tibia
?	uncertain

Age, Size, and Fusion Abbreviations

Y	Young
F	Fused
N	Infant, foetal, very young

Burning Abbreviations

V	variable
G	grey

Notes

1	Tiny canine perforations? = scat?
2	Edges lustrous. Polished? Inside label PL 50A FS #7.
3	Porosity and friability consistent with HUMAN but no diagnosis possible.

Table 9-2. Placitas MNI.

Site No.	FS No.	Neotoma	Sm./Med. Rodent	Small Rodent	Lepus	Silvi-lagus	Indet. Lg. Mammal Human?	Shell Mussel?	Small bird or Mammal	MI To Ta
PL 30A	157					1				1
PL 32A	126								1	1
	158								1	1
	208		1							1
	245				1					1
	249	1								1
PL 40A	65			1		?		1	1	3
PL 50A	2						1			1

uncertain identifications are shown by so (size of). Unidentified rodents shown as small were no larger than an Ord's kangaroo rat; medium rodents were no larger than a prairie dog. Small mammals were no larger than a cottontail. Large mammals had a body weight on the order of 40 kilogram or larger. These tend to be artiodactyls or humans, the two forms sometimes being distinguishable by bone texture. If more than one piece appeared to represent a single specimen broken in recovery, this fact is indicted by an asterisk (*) in the COUNT column of Table 9-1.

Where possible, materials were classified according to their skeletal element, the portion of that element represented, and laterality (R = right, L = left, ? = uncertain). Bone fusion was indicated, as was the more inclusive variable of apparent age. Burning was noted on one specimen; it was variably gray in color. Condition was observed in detail. Definite characters such as gnawing, scatological smoothing, and the very diagnostic effects of root-etching were noted. Less specific textural changes were noted as eroded or friable. Anomalies or striking observations are included in Table 9-1 as NOTES.

Taxa Recovered

Taxa recovered from the four sites PL 40A and PL 50A, plus PL 30A and PL 32A, as discussed below) included:

Leporidae:

Lepus ref. *californicus*	Blacktail jackrabbit
Sylvilagus sp.	Cottontail

Cricetidae:

Neotoma sp.	Woodrat

as well as --

- Small rodent
- Small/medium rodent
- Small bird or very small mammal
- Large mammal, possibly human
- Mollusk (pelecypod?)

Fauna from sites PL 30A and PL 32A were previ sly analyzed by Akins (this volume). This author a ees substantially with her diagnoses, but would prefer be somewhat less exact in the diagnoses of PL32A 58 (Akins' rodent) and PL 32A249 (Akins' immature-y ng adult). It is possible that some damage during han ng or storage has obscured features noticed by Akin In only one case do the present author and Akins disa ee; she views PL 32A208 as *Lepus*, but the piece is re considered small or medium rodent. It shoul be emphasized that the disagreement is not substa al: different analysts focus on different characters, se different comparative specimens, and draw on diff nt experience.

In all other cases, the present author agrees with A ns and refers the reader to her report (this volume or information regarding the PL 30A and PL 32A fau .

Two sites not examined by Akins are included in he present study (PL 40A and PL 50A). Material from t se sites was not consistent with the material from PL 0A and PL 32A (see Table 9-2). Lagomorphs and pac at were not recognized, although they may be preser as unidentified fragments. Present were a large f n, possibly human, and a mollusk which may be fres a-ter mussel.

PL 40A contained: (1) a cottontail-sized fragment, w ch may have been introduced as faeces; (2) one or two s all rodent skull fragments, very friable and from a very young individual; and (3) four shell fragments, one of which may bear edge-polish.

Site PL 50A was represented by five eroded and etched cancellous fragments, whose texture and porosity were more similar to that characteristic of human vertebrae than to the rather more durable, dense, and smooth bones of ungulates, bears and large cats. The shell fragments may actually be from this site, as a slip of paper in their vial was labeled PL 50A.

The Sites

The four sites sampled all appear to be small structural occupations. Of the small samples recovered, only PL 32A245 and PL 32A249, and perhaps PL 50A2, appear to be stratigraphically associated with occupational levels.

The taxa represented in the definitely identified samples (jackrabbit, pack rat) are not unusual in archeological sites; the rat fragment may have been introduced as scat. The possible human bone from PL 50A is provocative, possibly representing the clearing of a burial during reoccupation, but is too indefinite to support further inference.

Chapter 10 • Faunal Remains: PL 30A and 32A

Nancy J. Akins

Methodology

The identification of the faunal remains was completed on a site-by-site basis and by the numerical sequence of the FS number (Table 10-1). This was done primarily using the comparative collection put together by myself at the National Park Service Albuquerque Office. FS 249-1 was taken to the Museum of Southwestern Biology, University of New Mexico, to determine which of the species of *Neotoma* it might represent.

No identification was made without comparison to a known specimen. The term "long bone" is used to describe any elongated and generally hollow bone in the body. This would include any of the limb bones, metacarpals, metatarsals and phalanges.

Besides the taxon, element (body part), side, and fragmentation of an element (bone), several other observations were recorded. Burning is complete unless otherwise noted. The color of the burn is also given. Specimens that are likely to be of recent origin are pointed out. One element was recorded as immature.

Taxa Recovered

The following taxa were recorded for the two sites. These will each be briefly discussed in the following section.

Leporidae	
Sylvilagus sp.	cottontail rabbit
Lepus californicus	black-tailed jackrabbit
Cricetidae	
Neotoma sp.	wood rat
Indeterminate	
small rodent	smaller than a wood rat
small mammal or bird smaller	size of *Sylvilagus* or

***Sylvilagus* sp.:** *S. auduboni* (the desert cottontail) is the most likely species to be represented in this collection. It is found in the area today (Findley et al. 1975). *S. floridanus* (the eastern cottontail) is a montane cottontail that can be found at higher elevations in the area and is a remote possibility. Species identification for the

Table 10-1. Detailed Description of Faunal Remains From PL 30A and PL 32A.

Element #	Taxon	Element	Fragmentation	Side	Other
PL 30A					
FS 157	108N 87E, Unit 69, Stratum A				
1	Sylvilagus sp.	tibia	distal end	left	probably recent -- a small amount of flesh remains on articular
PL 32A					
FS 126	106N 81E 0-20 cm				
1	small mammal or bird s.o. Sylvilagus or smaller	long bone	shaft fragment		
FS 158	108N 82E Unit 70 Level 2 Room 1				
1	rodent (small)	tibia	shaft fragment		burned: gray
FS 208	108N 82E Unit 70 Level 3 Room 1				
1	Lepus californicus	skull	zygomat fragment	left	
FS 245	108N 83E Unit 81 Level 6				
1	Lepus californicus	phalanx 1, hindfoot	complete		
FS 249	107N 83E Unit 75 Level 6				
1	Neotoma sp. s.o. N. mexicana or N. albigula	humerus	proximal end missing	left	immature -- young adult

Sylvilagus species found in New Mexico is difficult. Comparison of the depth of the lower jaw to the alveolar length of the cheek tooth-row can be used to separate *S. audubonl* from the other two species. However, an adequate sample of mandibles and of comparative specimens from the area are necessary to use this method.

One element was identified as *Sylvilagus* sp. It was a portion of a tibia with some black material, probably flesh, adhering to the articular surface. This suggests that it is of recent origin and not an archeological specimen.

***Lepus californicus*:** This is the only species of jackrabbit found in the study area today (Findley et al. 1975). Two elements from this species were recovered. Depending on how proveniences are divided for site PL 32A, one or two individuals could be represented. Neither of these was burned.

***Neotoma* sp.:** The humerus recovered from PL 32A was similar in size to both *N. albigula* and *N. mexicana*. *N. albigula* is the more common wood rat and is found from desert to mixed coniferous forest. *N. mexicana* is more likely to be found in higher or cooler and more mesic situations (Findley et al. 1975).

Post-cranial elements of these two species are not distinguishable. The individual represented in the collection was classified as a young adult. This means that it had reached full size but the proximal epiphyses had not yet fused. According to Bailey (1931) wood rats have multiple litters and young can be found almost any time of the year. This makes this species a poor indicator of seasonality.

Rodent: A tibia representing a rodent smaller than a wood rat was recovered. While those in this size class are often post-occupational burrowers, this specimen was burned, suggesting that it may have been eaten.

Small Mammal or Bird: One small fragment o bone shaft from an animal smaller than a co rabbit was recovered.

The Sites

Faunal elements from two sites near Placita Mexico, were identified. Neither site had a ver sample. PL 30A was represented by one possible element and PL 32A by five elements. Table 10- the number of elements, percentages and the M this collection. Table 10-1 provides detailed d tions of the remains. PL 32A has been treated unit. Dividing it up by layers would result in an two for *Lepus californicus*

Other than listing the taxa found at these sites th few conclusions that can be reached. The only b element was that of a small rodent. Animals this are less likely to be utilized than rabbit-sized or animals, although they may be trapped as househ agricultural pests. Their preponderance should taken as evidence of subsistence stress in such a sample.

Table 10-2. Faunal Elements from Two Sites.

Taxon	PL 30A			PL 32	
	N	%	MNI	N	%
Sylvilagus sp.	1	100.0	1		
Lepus californicus				2	40.0
Neotoma sp.				1	20.0
rodent				1	20.0
small mammal or bird				1	20.0
Totals	1	1		5	

Chapter 11 • Lithic Analysis: Albuquerque Area

Jack B. Bertram

Introduction

his report presents the author's summary and analysis data files compiled by archeological staff and consultants of the USDA Forest Service's Southwestern Regional ffice and Cibola National Forest. These files record the bservations made in the course of several descriptive nalyses carried out on chipped, ground and pecked one artifact collections taken from archeological sites the Albuquerque area of the Elena Gallegos Land xchange Project. Collections were made in 1981 and 982 in the course of survey, testing and excavation in e Placitas, Atrisco, Ball, Edgewood and Cedar Crest ectors of the Elena Gallegos Project.

e data discussed in this report are of four types. By r the largest data set is a general listing and coded scription of lithic artifacts from the Albuquerque area tes, which was prepared by David Legare and others. is thought that this data set at one time covered all thic artifacts from the Albuquerque area sites. When rovided to the author, however, the data set was not mplete. The degree of incompleteness, its causes, and s impact on this study are addressed in depth in ubsequent sections.

hree much smaller data sets encoded observations ade by Jeannie Schutt on sub-assemblages composed f (a) formal chipped stone tools, (b) chipped stone cores nd (c) groundstone artifacts from the Albuquerque area ites. These data are also non-exhaustive; some sites om some sectors are fully covered, while others are complete or even absent.

he data were provided to this author, by project computer specialist James Snyder, in two forms. The first as a set of raw data listings provided on magnetic iskettes. The second was a large collection of computer rintouts summarizing the data for the general and pecial analyses. The special analysis data were represented as decoded data lists. The general analysis data et was presented as lists and as cross-tabulations. The ross-tabulations were mostly found to be unusable. hese tabulations were of pooled primary variables material type and artifact type) which were incompletely documented and which appeared to have been one inconsistently in certain cases. For this reason, he printout listings were used only as cross-check eferences and as sources of information found to be issing from the magnetic data files.

This author was not directly involved in the lithic data recording phase of the Elena Gallegos Project, a lack which has made preparation of this report challenging and occasionally problematical. The analysts who originally set up the data observation categories, variable definitions and recording procedures had all completed their work several years before this report was begun.

No matter how carefully planned and how fully thought-out a lithic analysis, it is impossible for the project participants to produce documentation which will convey a total and full understanding of every convention, criterion and procedure adopted in the data recording phase. Inherently, some aspects of classifications, typologies, definitions and conventions are arrived at by consensus through discussion among the analysts. Inevitably, some of these aspects are understood and consistently implemented by the participants but are never fully recorded. The Elena Gallegos project is no exception in this regard.

It has been this author's responsibility to acquire an understanding of project history and conventions which is as full and accurate as possible. Resources used in this effort included project documents, analysts' notes, and the recorded data themselves. He has augmented these sources wherever possible by discussions with principals of the recoding analysis and field study phases of the project. Especially helpful in this regard were Joseph Tainter, David Legare, Charles Haecker, Lou Haecker, James Rancier, Carol Raish and Helene Warren, all of whom were to some degree involved in the design, organization, supervision, or implementation of the general analysis for all Elena Gallegos Project lithic collections from the Albuquerque area sectors. These individuals' recollections provided important aids to the author's understanding, especially in helping to clarify definitions and coding conventions as actually used in the general analysis.

The author unfortunately was not able to engage in similar discussions with Schutt, who was responsible for the selection of formal tool, core and groundstone specimens to undergo detailed study and for their subsequent descriptive analysis. Schutt was also involved in designing part of the general analysis. I have relied on the methods, procedures and definitions which have been advanced and described by Schutt, primarily in her parallel report on the lithics from the Farmington area Elena Gallegos sites, and secondarily in her very similar methods presentations reported for other projects (Schutt 1980, 1983, 1986; Schutt and Vierra 1980). These sources were augmented by the author's notes of discussions with Schutt on the subject of methods issues dating from her 1986 analysis of lithic collections from Abiquiu Reservoir. Schutt carried out the Abiquiu data analysis (still unpublished) under the author's supervision for the U. S. Army Corps of Engineers while both were employees of Mariah Associates, Inc.

The summaries and analyses presented here are reflections of the author's understanding of the intent and approach of the original descriptive analyses as carried out by Legare, Schutt and others. Some of the data in the USFS files are incomplete or are the products of sampling decisions which cannot now be fully reconstructed (see discussion below). The author was not always able to interpret the original project methods and definitions with confidence (see discussions, next section). In view of these limitations, conclusions are drawn and comparisons made only where the author believes data integrity and sampling comparability are adequate to support an inference.

Methods

Methodological considerations for this project include those relating to the definition, observation and recording of variables; those relating to particular decisions on interpretability and reliability of the data that were recorded; and those relating to approaches to study and interpretation. Definitional and observational issues are discussed in this section. Separate consideration is given to the general lithic analysis data set, the formal tool data set, the core data set and the groundstone data set. Inasmuch as the particulars of data quality assessment are somewhat different for each sector of the Albuquerque area, and in some cases different for each site examined, consideration of the more particular and more interpretive methodological issues is deferred until the relevant data presentations in subsequent sections below.

The General Lithic Study

The general lithic collections from the Albuquerque area sites were analyzed and recorded according to a protocol developed for the project. It is thought that the authors or later contributors for this protocol included David Legare, Jeannie Schutt, Helene Warren, James Rancier, Steven Street, Steven Fisher, Joseph Tainter and Charles Haecker. Several versions of the protocol were found in project files, but the version relied upon for the present study exists in multiple copies titled "Elena Gallegos Project: Codes for Lithic Analysis ... Post 8/25/82" which is referred to in the following discussion as the General Lithic Protocol (GLP). The full GLP is attached as Appendix 11-1; the more common codes are listed and interpreted in Table 11-1*, which will serve as a key for the reader's convenient reference while con[...] the data tables presented in the remainder of this [...]

In discussions with James Snyder, it was learn[...] the original coded data had undergone some rev[...] the course of computerization; this modified cod[...] used in the data files supplied to the autho[...] following is a discussion of the data codes an[...] interpretations, drawn from the general data p[...] Snyder's notes, and discussions with Legare and R[...] The reader should refer to Appendix 11-1 thro[...] the following discussion.

Although provision was made to code isolated [...]rences as well as sites in the General Lithic Proto[...] isolated occurrence codes were present in the [...] data sets.

Codes for site and recording crew were found [...] consistent with the GLP.

Subsite designation codes as specified by the GL[...] not successfully interpreted in most cases for the p[...] report. The author found in previous analyses (B[...] n.d.a, and this volume; Bertram and Burgett, th[...]ume) that labels of subsites were often used inconsis[...] between recorders, between the survey and t[...] phases, and between the field notes, lab catalog[...] preliminary descriptions. Subsite labels were the[...] ignored for this study except where the autho[...] confident that the subsite distinctions contained [...] coded data were unambiguous.

Artifact specimen number (for special analysis) [...] have been coded for all items selected for special [...]sis. This was sometimes done, but the poor fit [...] between the coded values in the general data set [...] the special analysis data sets, where it often w[...] coded, rendered it of little value.

Artifact type was coded as a two-digit number acco[...] to the GLP, with acceptable codes ranging from 01 [...] Other codes outside this range which were encoun[...] in the data set were uninterpretable; these were re[...] by the author as 45.

Except for the definitions given by Schutt in her [...]panion report in the Farmington volume of the [...] Gallegos project report (to which the reader should [...] for most specifics), no written information is availa[...] indicate the nature of the definitions used for th[...] specific artifact types listed in the GLP. Discuss[...]

** Editor's Note: The length and number of tables provided by the author of this chapter proved to be in excess of our publishing reso[...] Three tables appeared to be essential to an understanding of the data. These have been included in this publication; the rema[...] tables will be of interest to certain researchers needing specialized information. A full list of the Chapter 11 tables appears [...] appendix to this chapter. Copies of computer disks with the full tabular information can be provided upon application to the Ed[...]*

with Legare indicate that most definitions were drawn directly after those given in Chapman and Schutt (1977). The Chapman-Schutt definitions are generally more specific than those given in Schutt's Farmington presentation, especially with regard to the character of bifaces, preforms, unifaces and scrapers. Schutt states that scrapers are unifaces, while Chapman and Schutt allow scrapers to be any tool with a fully formalized and worked scraping (i.e., abrupt) edge. I find many of Schutt's definitions in her Farmington report (n.d.) unclear or unworkable, and prefer those given by Chapman and Schutt.

Artifact breakage was coded consistently with the GLP standard in most cases; the research approach taken in this report did not in most cases employ this variable.

Material type was coded according to the generally accepted convention of following Warren's material type code (Warren 1977, 1979b). The standard listing for this code was the listing contained in the GLP, which was found to differ from published listings in its extensiveness and in the interpretations given to certain codes. All copies of the GLP located by the author omitted listings for the New Mexico obsidians (the 3500 series) and the silicified woods (the 1100 series). Copies of these series as used by the general analysis team were finally located by Legare, who recalled that the team worked with a material type collection assembled by Warren and routinely referred problematic pieces to Warren as the analysis proceeded.

The only problems encountered in the use of the Warren codes for the present analysis were in Schutt's application of them, not in the GLP application. Schutt's application of the Warren codes is discussed below.

Material group was a material type pooling variable, which reduced the hundreds of Warren types coded in the course of the GLP analysis to about 30 material groups. It was not a GLP variable; rather, it was added by Snyder at Schutt's request and to her specifications. Since I was unable fully to comprehend the reasoning behind Schutt's material type pooling decisions (see Schutt n.d.), and since there appeared to have been some errors of assignment in the computer generation of the pooled codes, this variable was abandoned for the present analysis.

The author did employ a lower level of material pooling in many of the analyses presented below. In general, the various Santa Fe/ Pedernal chalcedonies and chalcedonic cherts (types 1050 through 1054 and 1090 through 1091) were treated as one material type; in most cases, the common silicified conchoidally-fracturing woods (types 1112 and 1113) were pooled into one count, as were certain other woods, certain of the mossy chalcedonies and chalcedonic moss jaspers, the Jemez obsidian series (types 3520 through 3525) and others. In all cases, pooling groups are explicitly listed in the following analyses as they are used. The author pooled only where (1) his own knowledge and experience indicated that the material types pooled were true co-occurring allomorphs; (2) where Warren herself had indicated in the past that the types were source-equivalent; or (3) where there was reason to believe that the materials did not differ significantly in functional or knapping properties.

Weight in grams and length, width, and thickness in millimeters were coded consistently for almost all of the GLP data. Legare's recollection was that the Chapman-Schutt definitions were used for these measurements.

Cortex codes were explicitly defined on the GLP itself. They appear to have been used consistently.

Utilization and retouch were coded separately for proximal, distal, left lateral and right lateral edges of flakes. For angular debris, it appears that these variables were by convention coded in the left lateral edge fields first, then in the right, proximal and distal fields if additional edges were present. In each case where edge use damage or apparently deliberate retouch was detected, a flag variable was coded to indicate the presence of use damage, unidirectional retouch, or bidirectional retouch. Data coded included edge angle (presumed to be the actual used/retouched edge angle observed, rather than the inferred angle before use damage or retouch), the edge shape and any wear patterns detected.

Edge angle was to have been measured to the nearest five degrees, according to the GLP, but some data sets appear to have been measured partly to the nearest degree, partly to the nearest five degrees and partly to the nearest ten degrees. The distribution of measurement precisions was different in different sectors, as will be noted in relevant sections below.

Edge shape used the Chapman-Schutt shapes (concave, straight, convex, concavo-convex and "projections," which last seems never to have been defined specifically in print). The GLP added two new shape classes: notches and denticulated. These classes are nowhere defined clearly.

Edge wear codes in the GLP amounted to 56 different possible codes, most of which never appeared in the data files; these included various combinations of nibbling, feathering, step damage, crescentic scarring, abrasion, polishing, pecking, striae and battering. There were also six codes reserved for use only on utilized but not retouched items. The six possible positive responses could indicate unidirectional vs. bidirectional use and the character of use damage evidence, which was restricted to scarring, rounding, or both damage types).

The edge use/retouch codes as defined by the GLP were applied inconsistently. In many cases, edge angles were not recorded; codes reserved for retouched items were applied to utilized items and vice-versa. The artifact classification variable required that retouched flakes, retouched angular debris and "retouched rocks" be coded as distinct artifact types and not as simple flakes, angular, or rocks. However, numerous cases were coded as artifact type simple flake or simple small angular debris but with retouch fields partly or fully filled out. These problems were all most severe in the Atrisco data set.

In many respects the most severe definitional problem encountered in the GLP analysis was related to the issue of flake platform character. The GLP allowed classification of flake platforms into "cortical," "collapsed," "facet (simple)," "retouched," "ground preparation," "stepped" and "indeterminant" types. Only cortical, collapsed, facet, and retouched types were common.

In ordinary lithic analysis, one may readily differentiate among (1) platforms with cortex; (2) platforms having a single non-cortical facet; (3) flakes having more than one non-cortical facet; (4) platforms bearing evidence that their flakes were struck from a retouched tool; (5) platforms bearing deliberate grinding or use polish; and (6) platforms too poorly preserved to assess. These distinctions are crucial to the reconstruction of lithic reduction strategies and of the context and intent of reduction. The significance of these distinctions is one of the few issues upon which almost all southwestern lithic analysts agree.

Chapman and Schutt (1977: 86) recognized the first and second platform types listed in the previous paragraph as distinct entities. They classified the third, fourth, and fifth platform types as retouch platforms. Further subdivision was made according to the presence or absence of utilization or preparation remnants on the edge that made up the flake platform's struck surface and proximal dorsal surface. They distinguished as crucial the number of facets on a platform; they did not (as is often apparently supposed) use the term retouched platform (presumably a platform retouched for improved striking control) at all. They inferred that cortical platforms were evidence of early stage reduction, that single facet platforms were evidence of ordinary later-stage flake production, and that retouch platforms were evidence of biface reduction, formal tool manufacture, tool resharpening, or tool recycling. Classification depended on the use evidence preserved on that remnant of the original object (functional core) from which the flake was struck. In short, the interpret
reduction for Chapman hinged on platform cha

Schutt's methodological section for her Elena G
Farmington area lithic analysis (the general des
analysis of which was carried out by the same sta
the same GLP as the Albuquerque general a
provides definitions which are directly and signi
in conflict with the Chapman-Schutt definition
distinguishes between cortical, faceted, retouch
lapsed and indeterminate (both unanalyzabl
ground platforms. Because of its potential signi
her definition of the faceted platform type is repr
completely here:

Faceted platforms include *both single and multi*
striking surfaces. Single facet platforms exhib
smooth, non-cortical surface that does not or
from an edge perimeter on the platform. Mul
platforms exhibit two or more non-cortical facets
not originate from an edge perimeter. *These pl*
are generally viewed as resulting from core re
rather than from formal tool manufacture (Schu
emphases added).

I know of no other lithic analyst who would endo
last sentence of this definition. In fact, most
reduction flakes exhibit multiple facets on thei
forms, but only those flakes detached with th
extreme control in the last stages of tool shapi
those flakes detached to resolve problems in tool
opment (e.g., *outre-passe* strikes and extreme th
strikes intended to remove midline bulges or ste
tures) will exhibit any shaping, grinding, or
micro-retouch. The experimenter who knaps his
own tools knows also that most of the flakes rem
resharpening of a dulled formal tool edge will
little or no microscopic or macroscopic evidence o
but will be, in formal terms, classifiable only as
with typical multi-facet platforms.

This definition conflates the majority of multi
platforms (those that lack grinding or small re
scars), rightly viewed by Chapman as retouch plat
with the single-facet platforms that are indeed the
diagnostic mark of later stage simple core redu
Schutt would reserve the term retouched platfor
those items which actually bear the microflaking
acteristic of tool resharpening or of the most extr
careful of platform preparation efforts. The reas
Schutt's departure from the now-standard Cha
and Schutt platform definitions is unknown, and
pose a serious problem for the interpretability of th
data from the Albuquerque area.

As the reader will find in succeeding sections o
report, the distinction between facet(ed) and retouc

platforms is central to interpretation of the Elena Gallegos data from all sectors. The most regular and predictable patterns (in abundance of artifact types, material types, amounts of cortex and other diagnostic data) are closely correlated with the relative abundances of cortical, facet(ed) and retouch(ed) platforms. If the GLP analysts used the Schutt definitions for platform types, then the Atrisco sites, with their abundance of retouch codes, have a higher incidence of resharpening flakes than has ever been recorded for general open lithic-ceramic sites in the Southwest.

In the author's opinion, one must assume (as Legare [personal communication] has indicated) that the GLP analysts used the Chapman-Schutt definitions. Otherwise, the abundances of various platform types in the Albuquerque general data set differ from the frequencies found in other analyses of Archaic and Anasazi assemblages from the region. This assumption cannot be completely verified; too much time has passed (even for David Legare's remarkable memory) since the GLP was used to code the Albuquerque and Farmington general data sets.

Platform/Dorsal angle is defined ideally as the angle of intersection of the platform remnant surface of a flake with the dorsal surface of the flake. It is analogous to the edge angle as measured for utilized or retouched debitage in that the angle being measured is the angle formed by the struck surface of the core and the surface along which the struck flake detaches. In general, detachment angles from simple core flakes are greater than angles from hard-hammer percussion bifacial core flakes, which are greater again than angles from soft-hammer percussion flakes.

I was unable to determine with precision how the angle was actually defined operationally. This is a question of some significance for the present analysis, because the distribution of detachment angles observed for all the Albuquerque sectors was rather higher (by perhaps 15 degrees or more) than the author would have expected. This is thought to indicate that the angle was measured very near the platform edge, which will result in higher edge angle readings than if the angle is measured using planes tangent to the flake surfaces several millimeters away from the actual edge. The reason for this difference in measurements is that the platform edge is almost never a true intersection of plane surfaces; rather, the edge tends to be rounded. Any measurement is thus a measurement of the intersection angle of approximating tangent planes. The closer to the actual edge are the tangent points, the more obtuse will be the resulting measured angle.

It should not be supposed that my inability to account completely for definitional genesis of the high platform detachment angles characteristic of the Albuquerque assemblages has significantly impaired the value of these data. The distributions may indeed be systematically skewed by observational procedures toward more obtuse values, but the distributional differences between various flake types or material types are still inferable from the data, as long as the measurement technique was relatively constant. There seems to be no reason to suppose that the technique was not held constant in the GLP analysis.

Eight columns of the GLP code were reserved for comments. Comments seem to have been coded to indicate the analyst's impressions or interpretations in greater detail than that permitted by the main body of the GLP. Within this range of optional codes were descriptors for degree of thermal alteration, specific category of biface flake described, notations of conjoinability, observations of potential blood residues, nature of specialized formal tools and cores or fragments thereof and other detailed observations.

These comment codes were rarely used, on the whole; the bulk of comment codes occurred in cases characterized as utilized or retouched flakes. David Legare and I were unable to reconstruct criteria for most of the comments used in the GLP analysis; consequently, these are discussed in the following text only rarely. Legare recalled that the use of the extensive GLP comment code system was confusing and that it may not have been employed systematically or comparably by all analysts.

Other provenience data were coded as the last listings in the GLP. These included the project area and sector (e.g., Albuquerque-Atrisco), project phase in which the object was collected (survey, testing, excavation), field specimen number, and feature number or specific provenience code. This last variable was problematical, as it seems to have been coded differently for different areas. The author was not consistently able to identify proveniences/features from the codes.

The Special Core Analysis Data Set

The Special Core Analysis (hereafter the SCA) was carried out entirely by Jeannie Schutt. Some parts of the original core analysis data were lost in a computer error and those specimens had to be studied again. It may be assumed that Schutt's methods remained constant, as there is no evidence that any other analyst was involved in this work.

It seems that certain cores were not included in the reanalysis done after the data loss episode. It is known that not all cores from the Albuquerque area sites were analyzed; no details of Schutt's procedures for selecting cores for further analysis are known. Some sites having significant core counts in the GLP data listings are not represented in the SCA listings, indicating perhaps that some data sets were never replaced after their initial loss. From the items actually selected for SCA study which may be keyed back to the GLP data set, it is evident that Schutt reviewed the actual assemblages in some cases, selecting occasional items that had been originally coded as flakes, denticulates, angular debris, etc. Obviously, these items would not have been selected had Schutt sampled from the data lists rather than from actual debitage examination.

Schutt's core protocol included the provenience and material variables described above for the GLP. The SCA protocol also included several variables oriented specifically at core description. These are now discussed in brief; the reader desiring more detail is referred to Schutt's methods presentation in her Farmington analysis (n.d.).

A variable labeled Artnum was coded for some of the SCA data. It seems to have been used as an arbitrary discriminator for cases where more than one core came from a single field specimen set.

Core type was coded as one of nine categories. These were single platform normal, multiplatform normal, biface normal, single platform exhausted, multiplatform exhausted, biface exhausted, tested core, bipolar core, and undetermined type of core. The bipolar, undetermined, and biface types were very rare in the coded lists.

Schutt's definitions of normal, exhausted and tested cores have been considered above in the presentation of the GLP artifact type definitions. Distinction of single platform cores from multiplatform cores is straightforward. As the author understands Schutt, a single platform core with only one flake detached is a tested core. Presumably, the platform for this single flake detachment blow is generally cortical. A core having one platform with more than one flake detached is a single platform core. A core having more than one platform is a multiplatform core, unless the platforms are formed by opposed and intersecting flake scars; in that case, the core is a biface core. The author remains unclear on Schutt's method of differentiation between biface cores and early stage bifaces; she says,"biface cores are similar to bifaces in overall morphology, however, they exhibit steeper edge angles along edge perimeters and high centers" (Schutt n.d.). It would seem that almost all of the bifacial objects from the Albuquerque area sites were classified by Schutt as bifaces rather than as biface cores.

Cortex for the SCA was difficult for the author to de as it was coded in at least three different way different versions of the SCA. The author has follo the version that best agrees with Schutt's Farmin methods section, as follows. A cortex code of 0 m that the object was completely noncortical. A code means that the object's surface was covered by less 26% cortex, but that some cortex was present. S larly, a code of 2 indicated 26 to 50%, 3 indicated 5 75%, 4 indicated 76 to 99%, and 5 indicated cortical coverage. The reader should note that sev cases of tested cores with less than 51% cortex reported, and that a few codes of 100% cortex encountered for cores. I cannot explain these ano lous observations.

Evidently, Schutt identified each platform surface r nant on the analyzed cores and assigned it an identif number, the Platform number. For each identi platform, she measured the lengths in millimeters o visible product flake scars. The resulting data w collected by Schutt "to aid in quantifying three sub tive core type categories." They were used by the aut to characterize the production of flakes of different si from different core types and materials. The SCA d recording system allowed the recording of up to n product flake scar lengths per platform for an unlimi number of platforms.

The data may call into some question my understand of Schutt's definition of exhausted cores, as a subst tial proportion of the non-exhausted (i.e., regular) co were found to have several product flake scars wh were less than 20 millimeters in length, and this fl length occasionally was dominant on objects classed regular cores. As was noted above, exhausted co were defined as having flake scars of 10 to 20 millimet in overall length.

A final variable, Other use, was coded in the SCA d set. This variable was intended to code use evider found on the core. Codes and their interpretations w given as follows: (1) battered, (2) ground edge, (3) conv GS, (4) battering, (5) knapper and (6) chopper. No oth information, lists of definitions, or explications of the codes could be located. As they were only very rar used, they could not be assessed statistically and are some cases ignored in the following presentation.

The Special Formal Tool Analysis Data Set

The Special Formal Tool Analysis (hereafter the SFT was carried out entirely by Jeannie Schutt. As was t case with the core analysis, sections of the formal tool analysis data were lost and those tools were restudied. It may be assumed that Schutt's methods remained constant as no other analyst was involved in this work.

As with the SCA study, it seems that certain formal tools were not included in the reanalysis after the data loss episode. It is known that not all formal tools from the Albuquerque area sites were analyzed; no details of Schutt's procedures for selecting formal tools for further analysis are known. Some sites having significant formal tool counts in the GLP data listings are completely unrepresented in the SFTA listings, indicating perhaps that some data sets were never replaced after their initial loss. From the items actually selected for SFTA study which may be keyed back to the GLP data set, it may be that Schutt reviewed the actual assemblages in some cases, selecting occasional items which had been originally coded as something other than formal tools.

Schutt's formal tool protocol included the provenience and material variables described above for the GLP, and additional provenience variables (e.g., excavation level) which were rarely coded. Because of difficulties in interpreting provenience data at levels of resolution higher than the site, which have been discussed adequately above, the level of resolution for analysis was generally limited to the site in the present study.

The SFTA protocol also included several variables oriented specifically at formal tool description. These are now discussed in brief; the reader desiring more detail is referred to Schutt's methods presentation in her Farmington analysis (n.d.).

Heat treatment was described as a separate variable; the discovery of conflicting protocols led the author to rely on the heat treatment data coding given in the formal tool data listings prepared originally by Snyder for Schutt.

Tool type was coded as any of fourteen options. These options and their codes were: (1) biface, (2) uniface, (3) biface/projectile point, (4) unidirectional extensive marginal retouch, (5) bidirectional extensive marginal retouch, (6) biface/drill, (7) perforator, (8) graver, (9) end scraper, (10) denticulate, (11) wedge, (12) net sinker, (13) flake and (14) not coded. The reader is referred to Schutt's definitions of these types as given in her Farmington methods section (Schutt n.d.).

A subsidiary variable modifying tool type was biface type, which was coded as one of 6 options. These options and their codes were: (1) blank, (2) early biface, (3) late biface, (4) bifacial tool, (5) unknown and (6) not coded. The author has assumed that the first four options represent a sequential and progressive array of reduction stages, corresponding to the biface stage concept as used generally in lithic analysis. The reader should consult Schutt's own presentations for further insight. This variable was coded for most but not all tools identified by tool type code as bifaces, for some but not all tools identified as biface/projectile points, and occasionally for other types as well. The resulting compound codes were sometimes not easily interpreted (e.g., items coded as "biface/projectile point - early biface"). Other codes were somewhat more self-evident (items coded as "biface/projectile point - late biface" were assumed to be point preforms).

Provision seems to have been made to code projectile point fragments by portion in a variable labeled Artifact portion code, but the only codes which were at all common were "whole" and "fragment"; other possible codes seem never to have been used.

The next variable coded seems to reflect Schutt's ideas about staged production in tool manufacture. She refers to this as completeness, but it has nothing to do with the fragmentary state of the artifact. Rather, it seems to reflect a belief that many tools, especially bifaces, were essentially unused until they were fully shaped into their final forms. An artifact which is not regularized enough by thinning, shaping and/or retouch to be classified as fully complete, in Schutt's usage, is labeled as incomplete (i.e., uncompleted). Artifacts which could not be assigned to either completeness state were to be coded as "undetermined." No full analysis of "completeness" states for the Albuquerque formal tools was attempted by the author for this report.

The next variable in the SFTA is functional angle; it is invariantly zero in the Albuquerque data, and hence may be ignored.

Data for use angle, edge use and secondary use were recorded for some items, presumably those where Schutt was able to discern use damage. Almost all codes for use were given as "unidirectional/hard" or "bidirectional." The alternate code options ("unidirectional/soft," "battering," and "boring/drilling") were very rarely used. Edge-use angle was almost always recorded, apparently to the nearest degree, when use damage was reported. The only secondary use code that occurred with any frequency was "secondary use (unspecified)," although other more specific options (reworked, edge shaping/backing, wedge, biface core/chopper) were also available.

All other codes used in the SFTA protocol were related to details of projectile point typology. These details are best conveyed by illustrations, which are presented for the Placitas and Ball Ranch data. The Atrisco projectile points have been discussed by the author (Bertram, this volume; Bertram and Burgett, this volume), as have the Placitas projectile points. My current views on the Placitas and Ball points are also reported in the appropriate sections of this chapter. Where points described in the SFTA data lists were not available for this study (directly or through photographs and sketches), Schutt's assessments as drawn from her coded observations are reported in the pertinent sections of this chapter.

Project-wide Patterns and Perspective

In the analysis of the Elena Gallegos Project's lithic data sets from the Albuquerque region, certain factors may limit the strength of inferences which can be supported with the available data. In order that the reader may approach the following report from a suitably informed perspective, the more important of these limitations will now be discussed.

Sampling procedures were in place for most phases of the Albuquerque area Elena Gallegos fieldwork, but these may now be reconstructed only approximately from memory and surviving notes. In some cases, the recorded data suggest that items were collected according to one protocol, but the participants' recollections indicate that a different protocol was used. The collections were subjected to careful descriptive analysis, but the personnel of the project underwent changes and the artifact collections suffered losses which may have affected the value of the initial laboratory efforts.

The data from some significant portion of the general lithic analysis were lost and the items were reanalyzed. As a result, the data from (especially) the Placitas sector general analysis are not usable to approach certain of the problems commonly set as goals of lithic analysis. With the exception of three fully excavated Placitas area sites, the general data files contain information about only <u>obsidian</u> artifacts.

The analysis of the Placitas collections from sites other than PL 30A, PL 32A, and PL 38A (the fully excavated sites) is therefore representative only of an unknown and possibly biased fraction of the Placitas sites' assemblages. As a result, the remaining 120-odd Placitas sites can only be approached by studying the Schutt specialty analyses of cores and of formal lithic tools and the general lithic analysis files for the obsidian data in isolation. The three data bases seemingly can no longer be cross-compared or otherwise related.

In this situation, it seems wise to approach the interpretation of patterns found in the Placitas lithic data with caution. This is a particularly unfortunate loss, since the collection procedures used at Placitas were the most rigorous and deliberately representativ entire project (Charles Haecker, personal comm tion and field notes; Joseph Tainter, pe communication and field notes).

A second example provides a curious contrast Placitas problem. The Ball Ranch sector sites w in general, collected systematically (Charles H personal communication). Rather, it would see only diagnostic items and exceptional items w lected. Items were selected to serve as materi voucher specimens and as chronological data s no effort was made on most sites to collect othe rials. The Ball Ranch data are known to have beer lost, as were the some of the Placitas data, t inventory management and file management Schutt did not randomly sample the specialty tions; her approach to object selection is unkn this author. The convergence of these factors wou might have supposed, badly damaged the valu interpretability of the Ball collections. This may the case.

The intuitive fit between the site assemblages des in the survey forms and the pooled assemblage fr Ball Ranch area is remarkably good, consideri problems outlined above. All types of chipped items, from most or all of the material types identi the field by A. H. Warren (a member of one crev listed in the Ball general data files. Moreover, the of formal tools and cores produced by Schutt see agree at a fairly high level with the listings of the items from the preliminary general lithic analysi set; the major problem I found in the Ball colle analysis was the systematic substitution in Sc data of the code for vitrophyre for the code for ho the dominant material type at Ball. This was su simple typographical or programming error, and easily corrected.

These observations should not be taken to imply th author views the Ball Ranch data as completely sentative of the original Ball collections. As was th for the Placitas excavated sites, the data may be tively intact and representational, but simple pru dictates that this assumption not be taken as a s

With relatively minor exceptions and excluding th special analysis data set, it appears at this time th Atrisco data are in relatively good condition an relatively complete. Almost all formal tools from A were analyzed as part of Schutt's special study. Atrisco core special analysis is incomplete, but u within limits on a site-by-site basis.

Because of the problems outlined above (and other, lesser but related issues), the author has in some cases declined in this report to advance generalizations or interpretations which would need to be solidly founded on assumptions of data integrity, data representativeness, or sampling rigor either in the field or in the course of the descriptive analyses. There remain a significant number of potentially valuable generalizations which can be supported by the data at hand. These are presented below.

One may with profit examine patterns within a single class of material or of artifacts, especially if those patterns are not of the sort likely to have been altered by selective errors in field collection, lab coding, storage, or electronic data processing. As a case in point, one may still study the obsidian collections from Placitas as examples of the obsidian lithic sub-assemblage of that area.

A good example of the potential for data analysis still inherent in the Elena Gallegos Albuquerque area lithic files is provided by the patterning discovered in utilized and retouched flakes from Ball and Placitas. Much of the data on retouched flakes is based on detailed examination of individual objects, and hence is probably resistant to field biases. There is no reason to suppose that electronic or other damage selectively altered the patterns recorded for retouched flakes. Most of the patterning is implied by co-occurrence of observations on objects taken one at a time; if the code for an object survived at all, it probably survived intact.

It is normal to assume that the author of an analysis report writes from first-hand familiarity with the materials described, using observations, measurements, methods and procedures designed by, selected by and accepted by the author and applied by the author or under the author's supervision. This is not the present case. The analyses presented here are based on observations made some years prior to this writing, by persons other than the author, using approaches and definitions which the author would not have chosen in all cases. The author's familiarity with these sites springs from prior work in analyzing faunal materials, from writing reports on site testing and excavation based on field notes and specialists' reports, and from analyses of data from other projects which since have been undertaken in the areas (in a few cases on the same sites). The author has also made *post hoc* visits to a few of the more problematic sites covered in this project.

The analyses of formal tools, of cores and, to some extent, of the general assemblages of the Albuquerque sector of Elena Gallegos were set up along lines first laid down in the Cochiti Reservoir and Coal Gasification Projects of the 1970s. I do not agree with certain of the analytical assumptions made by the designers of those analyses, or of the present analysis. The variables observed, the ways in which those variables were observed, and the kinds of inferences permitted by the observations, all are strongly related to the assumptions accepted by the analysis designers. I found myself working with variables the definitions of which I did not fully accept, or perhaps did not fully comprehend, and the relevance of which I would often have questioned, given the option. This is especially true in the study of wear patterns, in the description and interpretation of formal tools and in the pooling of artifact and material classes.

As I came to the analysis long after the data were fully described and encoded, I had little choice but to withhold interpretation where I differed strongly with the approach of the analysis designers, or to work with the raw codes rather than the pooled data. Both of these options were generally taken in the study presented below.

Artifact Type Abundance

Of the 11,422 records for the general data base, 74.0% were from Atrisco, 19.0% from Placitas, 6.4% from Ball, 0.4% from Edgewood and 0.2% from Cedar Crest (Tables 11-2 series). Overall, these assemblages were dominated by only a few types. These were, in declining order of abundance, flakes (8,625 items overall, or 75.5%), small angular debris (overall 11.2%), unmodified rocks (overall 3.6%), cores (overall 3.0%), bifaces (overall 1.6%), bipolar flakes (overall 0.8%), exhausted cores (overall 0.7%), tested cores (overall 0.6%) and retouched flakes (50 items overall, or 0.4%). Together, all the other 35 tool types included in the GLP accounted for the remaining 2.6%. Of these, 8 types were never recognized from the Albuquerque sites.

In comparing project areas to each other and to the overall abundance trends, it was found that the Atrisco collections were as a whole unusually high in small angular debris, large angular debris, unmodified rocks, hammerstones, manos and other groundstone. They were low in cores of all sorts, retouched items, projectile points, unifaces, scrapers, choppers and denticulates. The Ball collections were high in ordinary cores, exhausted cores, retouched flakes, retouched small angular debris, unifaces, scrapers, perforators, axes, denticulates and combination core-hammerstones. They were low in angular debris. The Edgewood and Cedar Crest collections were so small that their overall abundance patterns were probably subject to important random errors and collecting biases, but they appeared to be high in bifaces, preforms and projectile points. The Placitas collections

Table 11-2a. Overall Listing of Atrisco Artifacts for the Elena Gallegos Albuquerque Area Lithics Study 1990.

Record No.	Group	Crew	Site	Subsite	Workphase	Provenience	Flakes	RetchFlk	SmAngDebris	LgAngDeb	Point	Biface	Unifaces	Rock	Cores	Burin	Hammerstone	Chopper	Scraper	Mano	OthGrStne	Handhoe	TestedCore	ExhauCore	CoreChop	CoreHamr	BipoFlk	RetchSAD	RetchRock	MetatFrg	Firespall	Anvil	Ham/CorFlk	GSFlake	"Other"	BadData	Totals
1	1	1	1	1	1	2	4	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
2	2	1	1	1	2	2	1594	0	161	1	2	48	3	44	8	0	1	0	0	6	4	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	1876
3	3	1	1	1	2	3	88	0	13	0	0	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	106
4	4	1	1	2	1	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5	5	1	1	2	2	3	0	0	0	0	0	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	10
6	6	1	1	3	1	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7	7	1	1	6	1	7	8	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
8	12	1	2	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9	16	1	3	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
10	17	1	3	2	1	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11	8	2	1	0	1	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
12	13	2	2	0	1	1	7	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	11
13	18	2	3	0	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14	19	2	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15	20	2	3	0	2	1	131	0	54	0	1	1	0	10	2	0	1	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	206
16	22	2	4	0	1	1	9	0	1	2	0	0	0	2	4	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	23
17	24	2	5	0	1	1	15	0	4	3	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	25
18	25	2	5	0	2	1	16	0	2	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	1	0	24
19	26	2	6	0	1	1	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
20	27	2	6	0	2	1	7	0	2	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	18
21	31	2	7	0	1	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
22	33	2	8	0	1	1	13	0	4	0	0	0	0	21	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
23	34	2	8	2	2	3	11	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
24	35	2	8	3	2	4	3	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
25	36	2	8	4	2	5	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
26	37	2	8	5	2	6	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
27	38	2	8	7	2	8	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
28	41	2	9	1	2	2	15	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
29	42	2	9	2	2	3	9	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	12
30	44	2	10	0	1	1	15	0	2	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
31	45	2	10	1	2	2	18	0	2	2	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
32	46	2	10	2	2	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
33	47	2	11	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
34	48	2	11	1	2	2	11	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
35	49	2	11	2	2	3	17	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
36	52	2	12	0	1	1	6	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
37	53	2	12	1	2	2	62	0	1	0	0	0	0	25	0	0	2	0	0	1	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	94
38	9	3	1	0	1	1	18	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
39	10	3	1	1	1	2	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4
40	11	3	1	2	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
41	14	3	2	0	0	1	2	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
42	15	3	2	0	1	1	19	0	1	0	0	0	0	2	1	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
43	21	3	3	0	1	1	12	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
44	23	3	4	0	1	1	9	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	12
45	28	3	6	0	0	1	10	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
46	29	3	6	0	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
47	30	3	6	0	2	1	31	0	0	0	0	0	0	2	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	38

51	43	3	9	0	1	1	15	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	21
52	50	3	11	0	0	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
53	51	3	11	0	1	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
54	54	3	12	0	1	1	47	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
55	55	3	12	1	1	2	3	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
56	56	3	13	0	1	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
57	57	3	14	0	1	1	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
58	58	3	15	0	1	1	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8
59	59	3	15	0	2	1	1046	0	385	0	5	4	0	83	6	0	0	0	1	1	1	0	0	8	0	0	1	1	0	0	0	0	0	0	0	0	1542
60	60	3	15	0	2	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
61	61	3	16	0	1	1	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
62	62	3	17	0	1	1	8	0	5	2	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
63	63	3	18	0	1	1	8	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
64	64	3	19	0	1	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
65	65	3	20	0	1	1	13	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
66	66	3	21	0	1	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
67	67	3	21	0	2	1	11	0	2	1	0	0	0	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	18
68	68	3	21	1	2	2	5	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
69	69	3	21	2	2	3	10	0	3	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
70	70	3	21	3	2	4	14	0	0	0	0	0	0	4	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	21
71	71	3	22	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
72	72	3	22	0	2	1	18	0	9	2	0	0	0	0	3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
73	73	3	22	2	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
74	74	3	24	0	0	1	5	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
75	75	3	24	0	1	1	3	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
76	76	3	24	0	2	1	18	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24
77	77	3	24	2	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
78	78	3	25	0	2	1	12	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
79	79	3	25	1	2	2	83	0	11	1	0	0	0	2	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	102
80	80	3	25	2	2	3	70	0	20	1	0	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	95
81	81	3	27	0	1	1	4	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
82	82	3	27	1	2	2	310	0	24	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	337
83	83	3	27	2	2	3	414	0	63	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	480
84	84	3	28	0	1	1	9	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
85	85	3	28	0	2	1	78	0	21	0	0	1	0	4	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	112
86	86	3	29	0	1	1	13	0	0	0	0	0	0	3	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	20
87	87	3	29	0	2	1	38	0	8	1	0	0	0	2	3	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
88	88	3	31	0	2	1	220	1	36	2	0	1	1	16	11	0	7	1	0	4	0	0	4	7	0	0	0	0	0	2	0	1	0	0	0	0	314
89	89	3	31	0	2	2	68	0	32	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109
90	90	3	32	0	1	1	11	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
91	91	3	33	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
92	92	3	33	0	1	1	21	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
93	93	3	34	0	1	1	18	0	0	0	0	3	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	26
94	94	3	35	0	2	1	1207	0	250	0	0	38	0	24	3	0	3	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	1529
95	95	3	36	0	2	1	160	0	12	0	2	7	0	19	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	206
96	96	3	37	0	2	1	102	0	2	0	0	4	0	28	2	0	5	0	0	1	2	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	149
97	97	3	38	0	2	1	106	0	13	2	0	0	0	10	4	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	138

Note: Analysis included several types which were not found at any Atrisco sites. These include Preforms, Perforators, Hammer-Choppers, Axes, Handhoes, Denticulates and Hammer/Coreflakes.

Table 11-2b. Overall Listing of Ball Ranch Artifacts by Provenience for the Elena Gallegos Albuquerque Area Lithics Study, 1990.

Record No.	Group	Crew	Site	Subsite	Workphase	Provenience	Flakes	RetchFlk	SmAngDebris	Point	Biface	Unifaces	Rock	Preform	Cores	Perforator	Hammerstone	Chopper	Scraper	Axe	SNTool	TestedCore	ExhauCore	CoreHamr	BipoFlk	RetchSAD	RetchRock	Denticulate	Firespall	CoreGrStne	Ham/CorFlk	GSFlake	"Other"	BadData	TOTALS
98	3	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
99	7	3	3	0	1	0	16	2	0	1	0	1	2	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	25
100	11	3	4	1	1	-2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
101	15	3	5	2	1	-3	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
102	19	3	6	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
103	23	3	7	1	1	-2	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
104	24	3	7	2	1	-3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
105	28	3	8	1	1	-2	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
106	29	3	8	2	1	-3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
107	33	3	9	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
108	37	3	10	0	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
109	41	3	11	1	1	-2	15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
110	42	3	11	2	1	-3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
111	46	3	12	1	1	-2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
112	47	3	12	2	1	-3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
113	51	3	13	0	1	0	3	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
114	52	3	13	1	1	-2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
115	56	3	14	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
116	60	3	15	0	1	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
117	64	3	16	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
118	68	3	17	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	8
119	71	3	18	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
120	75	3	19	0	1	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
121	79	3	20	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5
122	83	3	21	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
123	84	3	21	1	1	-2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
124	88	3	22	0	1	0	4	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	8
125	92	3	23	1	1	-2	5	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	9
126	93	3	23	2	1	-3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
127	97	3	24	0	1	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
128	101	3	25	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
129	105	3	26	0	1	0	2	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
130	112	3	27	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	7
131	114	3	28	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
132	116	3	29	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
133	118	3	30	1	1	-2	6	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
134	119	3	30	2	1	-3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
135	122	3	31	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
136	124	3	32	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
137	126	3	33	0	1	0	5	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
138	127	3	34	1	1	-2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
139	128	3	34	2	1	-3	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
140	130	3	35	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
141	132	3	36	0	1	0	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
142	134	3	37	0	1	0	4	2	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	9
143	135	3	38	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

144	137	3	39	0	1	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	139	3	40	0	1	0	12	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	15
146	8	4	3	0	1	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
147	12	4	4	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
148	16	4	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
149	25	4	7	0	1	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
150	30	4	8	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
151	34	4	9	0	1	0	6	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	11
152	38	4	10	0	1	0	7	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	10
153	43	4	11	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
154	48	4	12	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
155	53	4	13	0	1	0	9	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	1	0	0	1	0	0	0	0	0	0	0	15
156	57	4	14	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
157	61	4	15	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
158	65	4	16	0	1	0	11	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
159	69	4	17	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
160	72	4	18	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
161	76	4	19	0	1	0	16	1	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	22
162	80	4	20	0	1	0	11	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	15
163	85	4	21	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
164	89	4	22	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
165	94	4	23	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
166	98	4	24	0	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5
167	102	4	25	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
168	113	4	27	0	1	0	5	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
169	117	4	29	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
170	120	4	30	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
171	123	4	31	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
172	125	4	32	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
173	129	4	34	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
174	131	4	35	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
175	133	4	36	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
176	136	4	38	0	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
177	138	4	39	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
178	140	4	40	0	1	0	22	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
179	1	5	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
180	4	5	2	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
181	9	5	3	0	1	0	4	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
182	13	5	4	0	1	0	6	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
183	17	5	5	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
184	20	5	6	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
185	26	5	7	0	1	0	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
186	31	5	8	0	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
187	35	5	9	0	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
188	39	5	10	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
189	44	5	11	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
190	49	5	12	0	1	0	3	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
191	54	5	13	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
192	58	5	14	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
193	62	5	15	0	1	0	3	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	7
194	66	5	16	0	1	0	5	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
195	73	5	18	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
196	77	5	19	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
197	81	5	20	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

Record No.	Group	Crew	Site	Subsite	Workphase	Provenience	Flakes	RetchFlk	SmAngDebris	Point	Biface	Unifaces	Rock	Preform	Cores	Perforator	Hammerstone	Chopper	Scraper	Axe	SNTool	TestedCore	ExhauCore	CoreHamr	BipoFlk	RetchSAD	RetchRock	Denticulate	Firespall	CoreGrStne	Ham/CorFlk	GSFlake	"Other"	BadData	TOTALS
198	86	5	21	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
199	90	5	22	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
200	95	5	23	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6
201	99	5	24	0	1	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	6
202	103	5	25	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6
203	106	5	26	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
204	107	5	26	1	1	-2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
205	108	5	26	2	1	-3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
206	115	5	28	0	1	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
207	121	5	30	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
208	2	6	1	0	1	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
209	5	6	2	1	1	-2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
210	6	6	2	2	1	-3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
211	10	6	3	0	1	0	8	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
212	14	6	4	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
213	18	6	5	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7
214	21	6	6	1	1	-2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
215	22	6	6	2	1	-3	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
216	27	6	7	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
217	32	6	8	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
218	36	6	9	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
219	40	6	10	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
220	45	6	11	0	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	14
221	50	6	12	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
222	55	6	13	0	1	0	8	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
223	59	6	14	0	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
224	63	6	15	0	1	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
225	67	6	16	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
226	70	6	17	0	1	0	14	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
227	74	6	18	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
228	78	6	19	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
229	82	6	20	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
230	87	6	21	0	1	0	10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
231	91	6	22	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
232	96	6	23	0	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
233	100	6	24	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
234	104	6	25	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
235	109	6	26	1	1	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
236	110	6	26	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
237	111	6	26	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Note: Analysis included several; types not present at any Ball sites. These include LgAngDeb, Burins, Hammer-Choppers, Manos, Other Ground Stone, Hand hoes, Core Choppers, Metate fragments and Anvils.

Table 11-2c. Overall Listing of Placitas Artifacts by Provenience for the Elena Gallegos Albuquerque Area Lithics Study, 1990.

Record No.	Group	Crew	Site	Subsite	Workphase	Provenience	Flakes	RetchFlk	SmAngDebris	LgAngDeb	Point	Biface	Unifaces	Rock	Cores	Hammerstone	Chopper	Scraper	Hamrchopr	OthGrStne	TestedCore	ExhauCore	CoreHamr	BipoFlk	RetchSAD	RetchRock	MetatFrg	Denticulate	Firespall	GSFlake	BadData	TOTALS
245	4	1	4	0	1	0	6	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
246	9	1	8	0	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	14
247	11	1	9	0	1	0	10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
248	14	1	11	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
249	17	1	13	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
250	18	1	14	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
251	19	1	15	0	1	0	8	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
252	21	1	16	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
253	24	1	23	0	1	0	25	1	0	0	0	0	0	3	9	0	0	0	0	0	2	5	0	2	0	0	0	0	0	0	0	47
254	27	1	28	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
255	29	1	30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
256	30	1	30	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
257	31	1	30	0	3	0	333	3	20	0	6	5	1	0	13	4	2	0	1	1	0	3	5	0	0	0	1	1	2	0	1	401
258	32	1	30	0	3	1	79	1	1	0	2	1	0	1	4	1	0	0	0	0	0	1	0	1	1	0	2	0	0	0	0	95
259	33	1	30	0	3	2	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
260	34	1	30	0	3	4	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
261	35	1	30	0	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
262	36	1	30	0	3	14	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
263	37	1	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
264	38	1	32	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
265	39	1	32	0	3	0	459	3	33	4	0	0	0	26	47	1	0	0	0	1	6	0	1	15	0	0	1	0	0	1	0	598
266	40	1	32	0	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
267	42	1	33	0	1	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	8
268	43	1	34	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5
269	44	1	35	0	1	0	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	9
270	46	1	36	0	1	0	23	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
271	48	1	38	0	1	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
272	49	1	38	0	3	0	9	0	1	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	16
273	50	1	38	0	3	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
274	51	1	39	0	1	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	7
275	52	1	40	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
276	54	1	41	0	1	0	6	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
277	55	1	43	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
278	62	1	51	0	1	0	10	0	0	0	0	0	1	0	3	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	16
279	64	1	52	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
280	66	1	53	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
281	67	1	54	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
282	68	1	55	0	1	0	14	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	17
283	70	1	56	0	1	0	7	0	0	0	0	0	0	0	3	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	13
284	72	1	58	0	1	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	16
285	74	1	59	0	1	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
286	76	1	60	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
287	77	1	61	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
288	79	1	62	0	1	0	6	0	1	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11
289	80	1	63	0	1	0	29	0	1	0	0	0	0	0	13	0	0	1	0	0	4	3	0	0	0	0	0	0	0	0	0	51
290	82	1	64	0	1	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5

Record No.	Group	Crew	Site	Subsite	Workphase	Provenience	Flakes	RetchFlk	SmAngDebris	LgAngDeb	Point	Biface	Unifaces	Rock	Cores	Hammerstone	Chopper	Scraper	Hamrchopr	OthGrStne	TestedCore	ExhauCore	CoreHamr	BipoFlk	RetchSAD	RetchRock	MetatFrg	Denticulate	Firespall	GSFlake	BadData	TOTALS
291	83	1	65	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
292	88	1	69	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
293	90	1	70	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
294	92	1	72	0	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
295	94	1	73	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
296	95	1	74	0	1	0	25	1	1	0	0	0	0	0	1	0	0	0	0	0	0	5	0	4	0	0	0	0	0	0	0	37
297	96	1	77	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
298	97	1	79	0	1	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
299	98	1	80	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4
300	99	1	82	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
301	100	1	83	0	1	0	16	0	1	0	0	0	0	0	1	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	24
302	101	1	84	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
303	103	1	86	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	8
304	104	1	87	0	1	0	4	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	8
305	105	1	88	0	1	0	31	1	2	0	0	0	1	0	3	0	0	1	0	0	0	3	0	2	0	1	0	0	0	0	0	45
306	106	1	88	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
307	107	1	89	0	1	0	6	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	1	0	0	0	0	0	11
308	110	1	91	0	1	0	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	6
309	111	1	92	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
310	112	1	93	0	1	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
311	113	1	94	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
312	114	1	96	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	7
313	115	1	97	0	1	0	10	0	1	0	0	0	0	0	3	0	0	0	0	0	3	1	0	1	0	0	0	0	0	0	0	19
314	116	1	98	0	1	0	4	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	10
315	117	1	99	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
316	118	1	102	0	1	0	4	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	12
317	119	1	103	0	1	0	4	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	8
318	120	1	104	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
319	121	1	105	0	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5
320	122	1	106	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
321	123	1	107	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6
322	124	1	108	0	1	0	4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	2	0	1	0	0	0	0	0	10
323	125	1	109	0	1	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	7
324	126	1	112	0	1	0	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	9
325	127	1	113	0	1	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6
326	128	1	114	0	1	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	7
327	129	1	115	0	1	0	9	0	1	0	0	0	0	0	2	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	16
328	130	1	116	0	1	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5
329	131	1	117	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
330	132	1	118	0	1	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
331	133	1	119	0	1	0	11	1	0	0	0	0	0	1	0	0	0	0	0	0	3	5	0	1	0	0	0	0	0	0	0	22
332	134	1	120	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
333	135	1	122	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
334	136	1	123	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2

339	1	2	1	0	1	0	11	0	0	0	0	0	0	0	1	0	0	1	0	0	3	2	0	1	0	0	0	0	0	0	0	19
340	2	2	2	0	1	0	22	0	0	0	0	1	0	1	12	0	0	0	0	0	2	3	0	8	0	0	0	0	0	0	0	49
341	3	2	3	0	1	0	11	0	0	0	0	0	0	2	10	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	27
342	5	2	4	0	1	0	4	1	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8
343	6	2	5	0	1	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	9
344	7	2	5	0	2	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
345	8	2	7	0	1	0	4	0	0	0	0	1	0	0	2	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	10
346	10	2	8	0	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	0	0	0	0	0	0	0	17
347	12	2	9	0	1	0	24	0	0	0	0	0	0	1	8	0	0	1	0	0	3	1	0	4	0	0	0	0	0	0	0	42
348	13	2	10	0	1	0	7	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0	4	0	0	0	0	0	0	0	16
349	15	2	11	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
350	16	2	12	0	1	0	9	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
351	20	2	15	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
352	22	2	16	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
353	23	2	17	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
354	25	2	23	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
355	26	2	25	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
356	28	2	28	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
357	41	2	32	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
358	45	2	35	0	1	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
359	47	2	36	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
360	53	2	40	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
361	56	2	43	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
362	57	2	44	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
363	58	2	45	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
364	59	2	48	6	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
365	60	2	49	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
366	61	2	50	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
367	63	2	51	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
368	65	2	52	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
369	69	2	55	0	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	10
370	71	2	57	0	1	0	19	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	25
371	73	2	58	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
372	75	2	59	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
373	78	2	61	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
374	81	2	63	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
375	84	2	66	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
376	85	2	67	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
377	86	2	67	0	1	0	12	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
378	87	2	68	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
379	89	2	69	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
380	91	2	70	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
381	93	2	72	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
382	102	2	85	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
383	108	2	89	0	1	0	4	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
384	109	2	90	0	1	0	13	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17

Note: Artifacts not present at any Placitas sites include Preforms, Burins, Perforators, Manos, Axes, SNTools, Handhoes, Core-Chop, Anvils, CoreGrStne and Ham/CorFlks.

Table 11-2d. Overall Listing of Cedar Crest Artifacts.

Record No.	Group	Crew	Site	Subsite	Workphase	Provenience	Flakes	SmAngDebris	Point	Biface	TOTALS
238	1	1	1	0	1	0	16	1	2	2	21
239	2	1	3	0	1	0	0	0	1	0	1

Note: All artifact categories in Tables 11-2a through c were considered; absent types were omitted from this table.

Table 11-2e. Overall Listing of Edgewood Artifacts.

Record No.	Group	Crew	Site	Subsite	Workphase	Provenience	Flakes	Biface	Preform	ExhauCore	TOTALS
240	1	1	1	0	1	0	2	0	1	0	3
241	2	2	1	0	1	0	9	0	0	0	9
242	3	2	2	0	1	0	14	0	0	0	14
243	4	2	5	0	1	0	9	3	1	0	13
244	5	2	6	0	1	0	4	1	0	1	6

Note: All artifact categories in Tables 11-2 a through c were considered; absent types were omitted from this table.

were unusually rich in all types of cores, in bipolar debris, in retouched rocks and perhaps in projectile points and scrapers.

To characterize the overall trends in artifact abundance for the Albuquerque area collections, all distinct provenlences identified within the coded data (384 records) were subjected to Pearson correlation analysis. Provenience records were used as cases and artifact type abundances as variables (Table 11-3). The resulting correlation matrix indicated that many artifact types were very sparsely represented, and even more common types were not strongly correlated with any other type. For example, scrapers correlated most highly with unifaces, at r = 0.151, and with exhausted cores, at r = 0.155. Only a few very strong correlations were discovered. These included flakes x small angular debris (r = 0.861), flakes x bifaces (r = 0.849), flakes x unmodified rocks (r = 0.768), small angular debris x unmodified rocks (r = 0.840) and bipolar flakes x ordinary co
0.724).

Material Type Abundance

A wide variety of material types were present
Albuquerque project collections (Tables 11-4a a
4b). In every area, only one or two material c
accounted for the majority of artifacts. At Atrisc
conchoidal fossil wood (type 1112) outnumbere
other single type, but the Santa Fe/Pedernal cha
nies (types 1050-1054 and 1090-91) were the nex
abundant types, accounting for almost half of all
rial type records. At Placitas, chalcedony type 105
the most abundant type (from the excavated sites
the Polvadera and Jemez obsidians (types 3520,
3524, 3525, 3530 and 3531, and perhaps 3500
and 3507) were the next most abundant. Togethe
accounted for (again) almost half the collection a
a larger proportion than did type 1054. At Ball, the
abundant material was hornfels (type 4350). Tog
with its cotypes 4351 and 4352, it accounted for h
collection. The next most abundant materials we
common form of Santa Fe/Pedernal (1054), a m
chert (1431), and dark conchoidal fossil wood (11

The sparse collections from Edgewood were dom
by dark conchoidal fossil wood (1112), by a chalced
fossiliferous chert (1014) and by the Jemez obsid
The very sparse collection from Cedar Crest conta
native Sandia black fossiliferous chert (1015) an
same obsidian and chalcedonic materials record
dominants from Edgewood and Placitas.

A very strong relationship, significant at the 0.
level, was found to exist between the number of
vidual material types (M) and total area assemblag
(N). No pooling of related or equivalent types was
for the regression analysis. The number of mat
types for each of the five study areas is predicted

$$M = (-42.896 \pm 4.726) + (15.436 \pm 0.732)*\log_e(N$$

This regression gave a correlation of r = 0.997,
ANOVA of:

Source	Sum-of-squares	dF	mean square	F-ra	P
Regression	6125.858	1	6125.858	444.	0.0005
Residual	41.432	3	13.781		

These results indicate that the combination of mate
types defined in the Warren code are present in th

Table 11-2f. Project Artifact Counts by Type by Provenience: Overall Totals.

	Atrisco	Bali	Cedar Crest	Edgewood	Placitas	All areas
Flakes	6,464	553	16	38	1,554	8,625
RetchRock	1	23	0	0	26	50
SmAngDebris	1,182	17	1	0	75	1,275
LgAngDeb	31	0	0	0	4	35
Point	12	3	3	0	10	28
Biface	134	8	2	4	30	178
Unifaces	7	5	0	0	8	20
Rock	357	9	0	0	42	408
Preform	0	1	0	2	0	3
Cores	108	50	0	0	190	348
Burin	3	0	0	0	0	3
Perforator	0	3	0	0	0	3
Hammerstone	34	1	0	0	6	41
Chopper	1	2	0	0	2	5
Scraper	1	11	0	0	11	23
HamrChopr	0	0	0	0	1	1
Mano	29	0	0	0	0	29
OthGrStne	20	0	0	0	2	22
Axe	0	3	0	0	0	3
SNTool	0	2	0	0	0	2
Handhoe	2	0	0	0	0	2
TestedCore	22	1	0	0	40	63
ExhauCore	19	6	0	1	58	84
CoreChop	1	0	0	0	0	1
CoreHamr	1	7	0	0	6	14
BipoFlk	1	3	0	0	88	92
RetchSAD	1	2	0	0	1	4
RetchRock	2	2	0	0	6	10
MetatFrg	12	0	0	0	4	16
Denticulat	0	8	0	0	2	10
Firespall	4	5	0	0	2	11
Anvil	1	0	0	0	0	1
CoreGrStne	0	1	0	0	0	1
Ham/CorFlk	1	2	0	0	0	3
GSFlake	1	1	0	0	1	3
'Other'	3	2	0	0	0	5
BadData	2	2	0	0	2	6
TOTALS	8,455	731	22	45	2,169	11,422

Albuquerque study areas in a relationship of type and item abundance closely approximating that to be expected in a sampling study of objects in a diverse population. In other words, the materials which dominate each of the Albuquerque area collections are different, area by area, but the overall number of individual material types found in each area is mainly a function of the size of the collections from each area.

Material Types and Reduction Stage

Material type and cortex presence comparisons in the Atrisco collections (Tables 11-5 and 11-6) indicate that almost all material types were represented primarily by artifacts with little or no retained cortex. Of all materials, only non-quartzitic sandstone (type 2000), vesicular vitrophyre (type 3704), and undifferentiated metaquartzite (type 4000) had frequencies of high-cortex items which equaled or exceeded their frequencies of items with little or no cortex. Of these three types, only the vitrophyre is a workable chipping stone; its vesicular nature, though, makes it undesirable if better chipping stone materials are available. This pattern indicates strongly that initial quarrying was not the primary activity in the Atrisco area. Even those materials which are locally very abundant (such as the Santa Fe/Pedernal chalcedonies and the local fossil woods) are represented mostly by items with little or no cortex.

One may infer that the Atrisco sites, most of which certainly had a quarrying or initial reduction component, were commonly the locus of later-stage reduction as well. In short, the Atrisco quarry sites are also occupation sites, hunting camps, or plant exploitation loci. Their use was directed both toward providing tools for settlements located in the Rio Puerco valley and toward provisioning forays into the hunting and gathering areas in the hills and grasslands to the west and in the Llano de Albuquerque plains to the east.

A different pattern obtained at Placitas; numerous fully knappable stone types were found to have relatively low frequencies of items with little or no cortex together with relatively high frequencies of items with significant amounts of cortex (Tables 11-7 and 11-8). In this latter category were types 1053-54 (Santa Fe/Pedernal chalcedonies), 1098 (chalcedony), 2200 (orthoquartz- ite), and 3500, 3501, 3502, 3510, 3520, 3523, 3524, 3525, 3531 (all Jemez obsidians found in the Santa Fe gravels), as well as the less workable 2700 (limestone) and 4000 (metaquartzite). There can be little doubt that the obsidians were being initially quarried in or very near the Placitas area and were being subjected to quarry testing and cleaning and/or to early-stage reduction in many of the Placitas sites. The most strongly contrasting phylum of materials, the type 1200 series chalcedonies, were represented only by items with little or no retained cortex; these materials would presumably have been imported from the Cochiti-Zia-Santa Ana area of the lower Jemez River valley and the lower

Table 11-4a. Common Material Types by Area.

Rank	Atrisco			Placitas			Ball			Edgewood			Cedarcrest		
Order No.	Warren Code	Item Count	Mater Type	Warren Code	Item Count	Mater Type	Warren Code	Item Count	Mater Type	Warren Code	Item Count	Mater Type	Warren Code	Item Count	Mat Typ
1	1112	2749	W	1054	444	K	4350	321	H	1014	11	C	3500	5	C
2	1054	2611	K	3530	289	O	4351	55	H	1112	11	W	1054	3	K
3	1052	389	K	3525	217	O	1054	45	K	3520	7	O	3520	3	O
4	1050	299	K	3520	200	O	1431	26	C	3525	7	O	3523	3	O
5	1214	230	K	3500	149	O	1112	24	W	1054	2	K	1015	2	C
6	1053	187	K	3523	141	O	1090	23	K	3523	2	O	3524	2	O
7	1142	178	W	1053	66	K	1600	17	C	1090	1	K	3525	2	O
8	1140	138	W	4350	65	H	1030	17	C	1091	1	K	1090	1	K
9	1151	119	W	3524	52	O	3525	14	O	1430	1	C	4350	1	H
10	1434	117	C	1430	51	C	3500	14	O	3530	1	O			
12	1091	94	K	3502	38	O	3520	10	O						
13	1113	76	W	1112	32	W	3524	10	O						
14	1600	57	C	1091	32	K	1110	9	W						
15	1110	51	W	1090	20	K	1120	9	W						
16	1014	51	C	3531	27	O	1150	9	W						
17	2200	49	Q	3510	20	O	???								

*Note: totals are for materials shown only, not for entire collections.

Atrisco	Placitas	Ball	Edgewood	Cedarcrest
TOTALS*	TOTALS*	TOTALS*	TOTALS*	TOTALS*
K = 3810	O = 1133	H = 387	O = 18	O = 15
W = 3511	K = 571	K = 68	C = 12	K = 4
C = 225	H = 65	C = 62	W = 11	C = 2
M = 105	C = 51	W = 51	K = 4	H = 1
Q = 49	L = 39	O = 48		
	W = 32			

Key to "Warren Code" Pooling:

Q = Quartzite	C = Chert	K = Chalcedony	W = Wood	O = Obsidian	M = Metaquartzite
2200 - 2221	1010 - 1056	1050 - 1054	1100 - 1199	3500 - 3599	4000
	1060 - 1072	1073 - 1074			
	1400 - 1699	1080 - 1091	H = Hornfels	S = Sandstone	L = Limestone
	1075 & 1092	1093 - 1391	4350	2000 - 2195	2700

reaches of the southern Pajarito plateau, where these materials are most common.

Many of the Placitas sites retained mostly the remains of early-stage reduction. One must infer that the cores, tools and non-cortical flakes produced here were transported elsewhere. Some may have been exported altogether, but most probably went to base sites in the valleys below or into mountain hunting and gathering camps in the Sandias above.

The Ball collections present a pattern of cortex abundance intermediate between the Atrisco and Placitas extremes (Tables 11-9 and 11-10). Hornfels (types 4350-4360) occurs rather commonly as cortical debris; it is the most abundantly available high-quality material type. Other materials (1046 green chert - possibly aberrant hornfels in this case) and yellow-brown w (types 1150-51) and also perhaps the quartzites (ty 2200 and 4000), occurred fairly commonly as corti material. Most of the remaining types, especially obsidians available nearby, had lower frequencies cortical material than they displayed in Placitas, higher frequencies than were common in Atrisco.

The assemblages from Cedar Crest and Edgewood very small, but they have a slightly higher incidence low-cortex items than even Atrisco.

The unusual erosional base geology of the Ball area m help account for these differences, while providing a k to the understanding of the settlement systems found

Table 11-4b. Most Common (>85 %) Material Types.

Material	Top 17 Atrisco	Top 16 Placitas	Ball	Total Edgewd	CC
Obsidian		1133	48	18	15
Chert	225	51	62	12	2
Chalcedony	3810	571	68	4	4
Quartzite	49				
Wood	3511	32	51	11	
Hornfels		65	387		1
Other	105	39			
	~85%	~85%	~85%	100%	100%

all the Albuquerque areas. Like Atrisco, Ball was probably a favored location for field houses and an acceptable location for hunting or hunting-support camps. Unlike Atrisco and Placitas, the Ball area is not underlain by rich river gravel deposits derived from the Jemez uplift, but rather by alluviums derived from the rapidly uplifting and heavily metamorphosed rocks of the Ortiz Mountains. The local gravels do not yield the variety, diversity, or quality of obsidian that can be found at Placitas, or of chalcedonies, cherts, woods, and quartzites found at Atrisco.

Unlike Placitas, the Ball area did not favor a combination of agricultural and upland hunting activities. The Ortiz/Tonque/Galisteo country would rarely have been as rich in game as the Sandia uplands. The Cedar Crest-Edgewood collections are probably representative of the logistic activities carried out in higher, better-timbered hunting areas by people who based their mountain forays in areas like Placitas.

Reduction Techniques and Products

The debitage items which retained measurable platforms at Atrisco were 2,727 in number (Table 11-11). Of these, nearly half were faceted platforms and almost a quarter were retouch platforms. Collapsed platforms outnumbered cortical platforms by a margin of three to two. Only six ground platforms were seen.

The three most commonly reported platform angles were 80, 82 and 78 degrees. Most platform angles for faceted and for retouch platforms were between 70 and 85 degrees. Cortical platform angles were a bit less acute, ranging mostly between 75 and 90 degrees. Many of the Atrisco data were recorded in one-degree increments.

The Atrisco reduction data would seem to indicate a dominant trend toward the reduction of cores for controlled flake production and the resharpening or shaping of tools with relatively abrupt edges. The abundance of retouch platforms may indicate a substantial transient depositional component; mobile people who relied on biface technology would tend to produce a very high proportion of flakes with retouch platforms from their earlier-stage bifaces used as cores, as well as from resharpening or shaping of later-stage bifaces and unifaces. Mobile adaptations were built around the use of a single portable object (the generalized biface) as core, general-purpose cutting and scraping tool and nascent formal tool.

At Placitas, a total of 1,124 flake platforms were measured and/or typed (Table 11-12). Cortical platforms were over twice as abundant as at Atrisco. Faceted and collapsed platforms were about equally abundant as at Atrisco and retouch platforms were only a tenth as abundant. Platform angles for cortical platforms at Placitas were much lower than at Atrisco, with most observations in the 60 to 85 degree range. Angles for faceted platforms ranged between 55 and 75 degrees. Of the few retouch platforms seen, almost equal numbers lay in two peaks, at around 50 degrees and around 65 to 80 degrees. A few of the Placitas items were recorded in one-degree increments.

At Ball, a total of 508 platforms were recorded (Table 11-13). Cortical platforms were even more abundant than at Placitas, amounting to almost four records in ten. Collapsed platforms were rare. Slightly over half the collection had faceted platforms. As at Placitas, few retouch platforms were seen. Ground, stepped and indeterminant platforms were extremely rare. Both cortical and faceted platform angles tended most strongly to fall in the 60 to 70 degree range, faceted platforms being perhaps a bit more acute on average than cortical platforms. Retouch platforms tended to be more common at around 60 degrees, but a few observations suggest a lesser peak at a more acute angle, as at Placitas. The Ball measurements were made in five-degree increments, with a detectable bias favoring measurements in multiples of ten degrees.

The resemblances between Ball and Placitas may reflect their possible use as mixed quarry, home-base and agricultural areas, with relatively little wild food acquisition, as was suggested earlier. Their differences from Atrisco are vivid; this may reflect the greater Archaic and early Formative component of the Atrisco data, produced by a system presumably more oriented toward mobile foraging. This is in contrast to the more settled agricultural systems characteristic of the generally later (Pueblo III - IV) peak occupations at Placitas and Ball.

Once again, interpretations at the areal level assume essential synchrony of assemblages within a given area;

this assumption is probably inadequate. The puzzling aspects of these collections may result simply from the loss of whole aspects of the data sets, as discussed above, or from a different mix of occupational periods in the different areas. Evidence for this view will be presented in later sections.

The platform data for Edgewood and Cedar Crest are too few to interpret with confidence (23 and 8 reports, respectively). The pooled collections contain mostly faceted platforms with edge angles in the 60 to 75 degree range, a few cortical platforms in the same angle range, a total of three retouch platforms (9.7%) and a single ground platform. In platform character, these collections thus resemble the Atrisco assemblage more than they do the assemblages from Ball or Placitas. This may reflect the character of the three outlying areas as mixed hunting-gathering and farming ranges. The data may, of course, also represent mixed usage in different temporal periods.

Flake Size Measurements

Debitage size studies commonly carry out measurement only on flakes that are considered to be complete (i.e., having a platform, a distal termination and intact lateral margins). This approach was not followed for this analysis because the author does not accept the assertion that complete flakes can be reliably discriminated from flake fragments by inspection.

As was argued in a recent study on quarry assemblages from Alibates Flint Quarries National Monument (Bertram and Rancier 1989), the assumption that all reduction conformed to the conventionally assumed patterns of core and/or biface reduction which yields typical flakes is not valid. At Alibates, flake terminations of several common sorts could not reliably be distinguished from flake end-snaps. Several reduction modes (wedging reduction, constrained crushing propagation, bipolar reduction) which did not conform to the ordinary core-flake and biface-flake model were common at Alibates, even though this quarry complex has long been thought to typify high-quality, standardized blade, biface and core technology in the southwestern United States. Evidence that the same patterns obtained in the Albuquerque area collections is presented below. The reader will particularly note the abundance in Atrisco collections (many of which display an overall high level of lithic reduction sophistication) of flake platform angles greater than 90 degrees. This indicates that the normal modes of hard-hammer flake detachment were probably not employed.

For these reasons, all items classified as ordinary flakes (i.e., coded as artifact type 1) were included in analyses of size patterns without regard to their coded valu[e for] completeness. The validity of this approach is a[rgued] below using the Atrisco flake data, which strongl[y sug]gest that little difference in size parameters c[an be] demonstrated between the complete and the frag[men]tary Atrisco flakes.

Complete measurements for type 1 flakes were rep[orted] for a total of 6,461 items from Atrisco, 1,554 items [from] Placitas and 553 items from Ball (Table 11-14). M[eans] for weight, length, width and thickness were all gre[atest] in Ball, intermediate in Placitas and lowest in At[risco]. Computation of the ratio of weight to the produ[ct of] length x width x thickness provides a convenient i[ndex], having larger values for those collections which [have] relatively the thinnest and most delicate debitage. U[sing] mean values for all four variables from the three a[reas], this index for Ball is 0.0013, for Placitas is 0.0015 [and] for Atrisco is 0.0024. The Atrisco assemblage is [thus] relatively thinner than are the essentially similar Pla[citas] and Ball collections.

Flake length/width ratios, again calculated from me[ans], indicate that the Atrisco assemblage flakes tended [to be] relatively more blade-like (i.e., relatively narrower) [than] did those from Placitas and Ball. Flake length/th[ick]ness ratios indicate that, on average, Atrisco flakes [were] relatively larger/thinner, Ball flakes intermediate, [and] Placitas flakes relatively smaller/thicker. These [data] reinforce the overall interpretations for assembla[ges] advanced above.

Comparison of Artifact and Material Correlations

It is clear that some form of quarrying is reflected in [the] Atrisco, Ball and Placitas assemblages, but this patt[ern] is confounded by differences among use patterns in [the] different areas.

Atrisco activities were directed toward the productio[n of] edges, cores and formal tools from silicified wood [and] from Santa Fe/Pedernal chalcedonies; the objects p[ro]duced were also probably consumed at least partly in [the] area (Tables 11-15 and 11-16). Angular debris, co[res] and exhausted cores were more often made from [the] local cherts and chalcedonies, while bifaces and fla[kes] (to a lesser degree) tended to be made from silicif[ied] woods. The differences in abundance between the wo[od] and chalcedonic material by artifact-type combinatio[ns] are strong. Ordinary core technology was directed [at] chalcedonic materials, while biface technology was [di]rected at fossil wood reduction.

This pattern suggests that much of the Atrisco asse[m]blages are older and/or more directed toward the supp[ort] f a mobile technological system than are those from the lbuquerque study areas east of the Rio Grande. Of the patterns identified in this section, the only one that eems inconsistent with this interpretation is the relaive rarity of flakes having prepared platforms and low latform angles, usually taken as diagnostic of biface eduction. Probably, the bifaces reduced here were ither very early stage items or else were worn and esharpened to the point that their product flakes had igh edge angles. The high abundance of retouch platforms would tend to support this interpretation. As noted above, the anomalously obtuse platform angle distribution may also be an artifact of measurement. As will be discussed later, it may also be a consequence of platform preparation technique.

Placitas activities were directed toward the production of obsidian cores and bifaces for local use and for transport elsewhere; the only common artifact types which were underabundant in the Placitas obsidian assemblage were flakes and angular debris (Tables 11-17 and 11-18). An opposite pattern characterized the reduction of chalcedonies, at least at the excavated sites. The smaller products of chalcedony reduction are abundant but relatively few cores, bifaces, or bipolar flakes were found. This might suggest that chalcedony materials were acquired elsewhere and used mainly for specialized purposes or to support transient visits to the obsidian source areas around Placitas. The third common material, hornfels, displayed a material by artifact-type abundance pattern essentially identical to that described for the chalcedonies.

The low frequencies of retouch platforms would seem to indicate that relatively few tools or early-stage biface cores were reduced in the Placitas area. It would seem likely that the debris produced by quarrying and the rough tools and cores made here would supply most of the cutting edge needs of the visitants, who could thus conserve the portable tools/cores brought with them.

The Ball Ranch collections seem to reflect the quarrying and use of hornfels. Quarrying may not have occurred as intensively within the immediate project area as did obsidian quarrying at Placitas. Hornfels, obsidian and chalcedony material by artifact-type patterns are all similar to those seen in Placitas, but the contrasts between material types is less extreme (Tables 11-19 and 11-20).

Perhaps the Ball collections represent an adaptive and strategic mix similar to that which characterized Placitas, but with a higher residential and agricultural component. Biface abundance did not correlate with debitage abundance in either area, as it did at Atrisco. This may indicate that bifaces played a different role in the Atrisco area than in the northeastern study areas. The bifaces recovered may not pertain to the same time period as does the different debitage in Placitas and Ball. Alternatively, the patterns may have been influenced by collection strategy and artifact visibility. The Atrisco non-structural sites experienced more systematic collection and excavation and were located in less heavily vegetated, more commonly deflated settings than was the case at Placitas or Ball Ranch. Put simply, a better sample of flakes may have been recovered, coded and analyzed for the Atrisco data set.

The Placitas Sector Collections

Of the hundreds of sites recorded from the Placitas sector, a total of eight sites having lithic artifact associations were tested (Bertram and Burgett, this volume) and three were fully excavated (Bertram, this volume). Unfortunately, only the excavated sites seem to be fully represented by their complete range of material types in the GLP data set; the other sites are represented almost exclusively by obsidian artifacts.

Short field visits to the sites, casual examination of the field notes, or scrutiny of the specialty analyses of cores and formal tools from the Placitas sites having only obsidian general lithic data will quickly reveal that these sites certainly contained substantial assemblages of cherts, chalcedonies and other materials in addition to obsidian. These non-obsidian assemblages appear to have been analyzed, but the Placitas non-obsidian general data files may have been among the materials electronically lost (David Legare, personal communication; James Snyder, personal communication).

Judging from field observation and examination of notes, many of the Placitas sites had assemblages (which were collected) resembling those from the three excavated sites. If so, then about 2,000 or so records on non-obsidian lithic items are simply missing from the general files. This estimate is based on ratios of obsidian to other materials calculated from the PL 30A and PL 32A data, these being the two productive and fully-documented excavated sites. From the testing phase field data for PL 24A alone, Burgett (Bertram and Burgett, this volume) estimated that over 3,000 items had been collected from that site. No data for PL 24A are present in the general lithic analysis files, yet the special analysis core data set for PL 24A is large and varied in material type, amounting to over half of all the cores analyzed in detail by Schutt from Placitas.

The assessments of the Placitas sector lithic assemblages which are possible in the present study are therefore limited. Where data are available, however, these will be presented and evaluated within appropriate limits. First to be discussed will be the larger Puebloan excavated sites, PL 32A and PL 30A. Consideration will then shift to the smaller sites, PL 38A and PL 88A, presented in detail because of their association with problematic natural or cultural stone alignments. These four assemblages will provide some perspective for the analysis of the incomplete data sets from the other Placitas sites.

Site PL 32A

This site was fully excavated (Bertram, this volume) and interpreted as an early Pueblo IV year-round farmstead or field house site, possibly with a small admixture of Pueblo II-III trash. Files on the general lithic analysis from this site listed 598 lithic items from the general site excavations, together with three flakes, a bipolar flake and one uninterpretable item record. These last were drawn from survey collections and from all other loci combined. The relationships among cortex, material type and artifact type abundances for these collections are summarized in Tables 11-21, 11-22 and 11-23.

Santa Fe/Pedernal chalcedonies were the most abundant material types on this site (364 items). These types occurred in all stages of reduction, although high cortex items and items with no cortex were the most common. Common artifacts made from this material phylum included flakes (290), small angular debris (21), cores (31), tested cobbles (4) and bipolar debris (13). Type 1054 was by far the most abundant material within this group.

Hornfels varieties were the second most abundant material phylum on PL 32A (52 items) and the third most abundant in Placitas overall. Types 4350 through 4352 and 4360 were recorded here. Cortex abundance on hornfels was not lower than was the case for the chalcedonies, but more items of intermediate cortex coverage and fewer highly cortical or noncortical pieces were found in hornfels than in chalcedony. Common artifacts made of this material included flakes (44), angular debris (3), cores (3) and tested cobbles (2). Type 4350 was the most abundant material in this group on PL 32A.

Knapped limestone (type 2700) and fossil wood (type 1112) were equally common on this site. No high-cortex pieces of fossil wood were found; the cortex coverage data for limestone are not very meaningful, but many items had high cortex percentages. One core and 31 flakes of 1112 wood were found; the limestone materials included a groundstone fragment, 2 cores and 31 debitage items, some of which may be masonry scrap and not lithic waste at all.

The obsidians were the fourth most abundant m[...] phylum on PL 32A (24 items), although obsidian w[...] most abundant material overall in the Placitas d[...] (partly due to factors discussed above). Obsidian[...] included flakes (15), angular debris (5), a cor[...] bipolar shatter (3). Less than a third of the obsidi[...] fully decorticated, and one item in six had ove[...] cortex. All items were referable to Jemez or unk[...] obsidian with one exception; this piece of Pol[...] (type 3530) had over 75% cortex.

Other fairly common types included the Jemez ba[...] moss jasperoid chalcedonies (types 1200 et seq.)[...] occurred only as low-cortex flakes, and also metaqu[...] (type 4000). This last type is reported as inclu[...] hammerstone, two cores, two tested cores and[...] items of debitage. The author is uncertain of the v[...] of these records, since most metaquartzites are un[...] able by percussion. Perhaps some items were ac[...] misidentified orthoquartzite, which is emin[...] knappable.

Examination of the relationship of flake platform[...] to platform type indicated that diversity of pla[...] types was low (Table 11-24). Of 381 platforms that[...] be characterized, faceted platforms were slightly[...] abundant than cortical platforms; retouch plat[...] were only three in number. Collapsed and indeterm[...] platforms made up the remainder of the data. [...] platform angles (approximately at 27, 60 and 7[...] grees) were apparently more common than interv[...] angles for faceted platforms. Platform angles for co[...] platforms appeared to have very subtle peaks at 5[...] 75, 85 and 110 degrees, and perhaps at 30 degrees[...] bulk of the platform angles reported for both cor[...] platform types lay between 60 and 85 degrees; smo[...] distributions for angles for the two platform type[...] similar.

The average size of flakes from PL 32A (Table 11-25[...] larger than the overall average for Placitas for all[...] measurements of size. In comparison with ov[...] trends, the PL 32A assemblage average resemble[...] Ball averages. It lies approximately halfway bet[...] Ball and Placitas. Flake thickness and weight espe[...] resemble Ball.

Only one formal tool was reported from this si[...] metate fragment. No manos, bifaces, points, pref[...] or unifaces were recorded in the general data ana[...] from PL 32A.

Fifteen utilized flakes and three retouched flakes [...] found in this site. All three retouched pieces [...] unidirectionally retouched notches. A chalcedony n[...] and a hornfels notch (both on distal flakes) had [...] angles of 60 degrees. A metaquartzite left lateral n[...]

had an edge angle of 40 degrees. No wear was reported for any of the retouched items.

Of the 17 edges on the 15 utilized flakes, seven were on chalcedony, two on obsidian, three on fossiliferous chert, three on silicified wood and two were on hornfels. Left edge shapes were evenly divided between straight, convex, concave and concavo-convex. Right utilized edges had five cases of straight edges and one example of each of the other three shapes seen on left edges. Right edges were much more acute than left edges (average of 40.7 vs. 54.4 degrees. The right angle range was lower than the left range as well (20 to 65 degrees vs. 30 to 80 degrees). All but one edge of the 17 had either unidirectional scars or unidirectional scars and rounding; the odd case had an edge angle of 55 degrees, a straight edge, and bidirectional scars and rounding wear. Of the edges with unidirectional wear, those with very low or high angles generally lacked rounding, while the rounded edges mostly had lower edge angles.

PL 32A is an anomalous site when viewed within the greater Placitas collections. It had relatively little obsidian and no definite bifacial technology, and it yielded few flakes with retouch platforms or low platform angles. The PL 32A collections may represent an exceptionally uncontaminated sample from a typical initial Pueblo IV field house site. If so, the absence of biface reduction and of formal chipped stone tools may not be anomalous. In materials, reduction and artifact type frequencies, this assemblage would not be out of place within the Ball Ranch field house and field-associated collections (see below).

Site PL 30A

This site was fully excavated (Bertram, this volume) and interpreted as a Pueblo II field house site. Files from the general lithic analysis from this site list a total of 517 lithic items from eight provenience (Tables 11-26 to 11-29). The most productive provenience (Tables 11-30 to 11-32) was the general exterior area (401 items). A large sample (95 items) was also recovered from the context of the structure (Tables 11-33 to 11-35). The other six proveniences together represent few (21) artifacts), of which five were collected on survey, fourteen were recovered from features (Features 2, 4 and 14), and two are of unknown provenience. The collections from the general exterior and general structural contexts will be discussed separately from the smaller proveniences, which are pooled in the following discussion. No evidence was found suggesting that important differences existed between the interior and exterior provenience assemblages. The two collections were similar in material selection, reduction patterns, platform character, flake size range and associated artifact types.

PL 30A General Exterior Context

Santa Fe/Pedernal chalcedonies were the most abundant material in this collection (195 items). These types occurred in all stages of reduction (i.e., all levels of cortex presence), with items having little cortex being most abundant. Abundant artifact types made on this material were flakes (165), small angular debris (9), ordinary cores (9) and core/hammerstones (5). Within this material group, type 1054 was the most common.

Obsidians were the second-most-common material group in this collection (94 items), with the most common material types being 3500, 3520 and 3525. Only type 3520 occurred in high-cortex items with any frequency; about half of the obsidian assemblage was non-cortical. Common artifact types included flakes (64), small angular debris (6), projectile points (6) and bifaces (5). Only one core (exhausted) was found.

The third most abundant material was "Laguna chert" (type 1430, which comes from many areas other than Laguna), represented by flakes (56), small angular fragments (2), a core and an exhausted core. All but two items of this material had less than 50% cortex; 32 items had no cortex. It is doubtful that this report indicates trade from the San Mateo area; chalcedonic cherts are not easily identifiable to source.

The fourth most abundant material group (25 items) was moss jasperoid chalcedonic chert, one of the types associated with the alluviums of the Jemez River (types 1200, 1210, 1214, 1215, 1221). About 30% of this material had traces of cortex, but the remainder was fully decorticated. It occurred as flakes (23), with one item of small angular debris and a denticulate also reported.

The only other material type present in greater than trace amounts was type 4350 hornfels (15 pieces), represented by two cores and debitage. Four items of this material had greater than 50% cortex; seven items had no cortex.

Material present in trace amounts included vitrophyre, metaquartzite, fossil woods (types 1109, 1110, 1111), limestone, orthoquartzite, greenstone, fossiliferous cherts, basalt and intrusive igneous materials.

Platform types represented included faceted (172), cortical (46), collapsed (33) and retouch (3) platforms (Table 11-36). A wide range of platform angles was reported for both cortical and faceted platforms. Cortical platforms appeared to be most abundant at angles of about 35, 50, 68 and 85 degrees, with the 68 degree peak being most prominent. Faceted platforms were most abundant at angles of 45, 65, 80, 90 and 115 degrees, with the peak at 65 degrees being most pronounced.

Flake size average measurements (Table 11-37) were not very different from the overall averages for the Placitas area, although all means were slightly smaller than the Placitas averages. The widest, thickest and heaviest flake at Placitas came from this provenience.

Four utilized flakes and three retouched flakes were recorded from this provenience. Utilized flakes included:

(1) a chalcedony flake with right lateral use at 45 degrees on a straight edge showing unidirectional scars,

(2) a chalcedony flake with right lateral use at 70 degrees on a concave edge showing unidirectional scars,

(3) a chalcedony flake with left lateral use at 35 degrees on a notched edge showing unidirectional scars and

(4) a "Laguna chert" flake with distal use at 75 degrees on a straight edge showing unidirectional scars and rounding.

Retouched items included:

(1) an obsidian flake with proximal retouch at 90 degrees on a straight edge showing unidirectional scars,

(2) an obsidian flake with left lateral retouch at 62 degrees on a straight edge showing nibble and step wear and

(3) a compound item with three edges.

The last tool noted above was made on jasper (type 1070). Its left edge was bifacially retouched to a concavo-convex shape having a 90 degree edge and bifacial wear. Its proximal end was unifacially retouched to a 45 degree concavo-convex edge with bifacial wear scars. Its distal end was worked bifacially to a 75 degree convex edge having unifacial wear.

Formal tools from the exterior collections at PL 30A were reported in the general analysis files to include six obsidian projectile points, five obsidian bifaces, an obsidian uniface, a limestone chopper, a basalt chopper, a silicified wood chopper/hammerstone and two orthoquartzite groundstone items, one a metate ment. Four other hammerstones and a total of five hammerstones, all of 1054 chalcedony, were repo Those formal tools coded by Schutt are discussed later section of this chapter.

PL 30A General Structure Context

The only materials abundant in this context wer Santa Fe/Pedernal chalcedonies, the Jemez River jasperoid chalcedonies, the obsidians and yellow-b jasper. Half of the collection (47 items) was Santa Pedernal chalcedony, which occurred in all stag reduction. It was found in the form of flakes (40), c (3), an exhausted core, a bipolar flake and a hammers

The mossy chalcedonies occurred only as flakes, all little or no cortex (10 items). Yellow jasper (4 it occurred also only as flakes, but both high cortex low cortex pieces were present.

The obsidians (22 items) were present in a wider va of forms than were the other materials. Included flakes (40), a retouched flake, a retouched ang fragment, an angular fragment, two points, a biface a core. A quarter of the collection was covered by cortex or more.

Three flakes of limestone, a fully cortical type 1040 c flake, a metaquartzite flake, two hornfels flakes, orthoquartzite metate fragment and a core of an documented material code (1634) were also pres This last item may have been a miscode for 1434 ch which occurred also as a flake.

Of the 55 analyzable flake platforms, 37 were faceted were crushed and 8 were cortical (Table 11-38). cortical platform angles may be more abundant around 57.5 and 75 degrees. Faceted platforms app to be more common at around 47.5, 65 and 7 degrees, which matches the distribution of faceted p form angles from the exterior context of this site above).

The measurable flakes from the structure associat at PL 30A are not very different from the exte assemblage described above, except that they appea be, on the whole, slightly smaller and rather less v able (Table 11-39).

Although the general listings indicate the presence retouched angular fragment and a retouched flake, o the flake's modifications seem to have been coded the computer files. It was a Pedernal piece with a degree convex right edge bearing undirectional sc from utilization.

Formal tools in the general analysis listings were reported as including two points, a biface and two metate fragments. Those formal tools coded by Schutt are discussed in a later section of this chapter.

PL 30A Small Collections

The six small provenlences from this site together represent few (21) artifacts, of which five were collected on survey, 14 were recovered from features (Features 2, 4, and 14), and two are of unknown provenience. Survey phase collections included only an unmodified cobble. Testing phase collections obtained five obsidian items: four flakes and a core. Collections from Feature 2 included four flakes and a point, all of obsidian; one of the flakes was retouched. Collections from Feature 4 included five Santa Fe/Pedernal (1051 and 1054) chalcedony flakes, an obsidian flake and a retouched flake of unreported material type. From Feature 5 came a chalcedony flake (1054). From Feature 14 came a flake and a retouched flake, both of obsidian. Excluding one obsidian flake from Feature 4, all items had little or no cortex.

Three cortical and five faceted platforms were reported from the pooled small collections. Platform angles ranged from 40 to 93 degrees; average platform angle was 70 degrees. No trend toward a particular range of platform angles was apparent in any single provenience.

The retouched flake from Feature 2 was a Santa Fe/Pedernal piece with bifacial retouch along the straight 66 degree left edge and unifacial retouch along the straight 51 degree right edge. Neither edge was apparently worn to a detectable degree. The retouched flake from Feature 4 bore bifacial 50 degree rework on its concavo-convex edge; wear evidence consisted of bidirectional scars. The tool from Feature 14 was bifacially retouched on the left edge to produce a concavo-convex 60 degree edge which bore bidirectional scars and rounding.

Site PL 38A

This small site was excavated because a structure was thought to be present in association with a projectile point of an early style (Bertram, this volume). Only 20 artifacts and 3 rocks were recovered from work at this site (Tables 11-40 to 11-43).

Material types at PL 38A included Santa Fe/Pedernal chalcedony (six items), obsidian (three unknown, two Jemez, one Polvadera), vitrophyre (three) and one item each of four other material types. Most obsidian had little or no cortex; all but one of the chalcedony items were cortical.

Artifacts at PL 38A included 12 flakes, a retouched flake, two angular fragments, an obsidian biface, a vitrophyre uniface, a Pedernal chalcedony core and a pink chert retouched rock. Only four platforms could be measured. All four were faceted; platform angles were 50, 51, 81 and 105 degrees.

One of the obsidian flakes bore unidirectional scars and rounding on the convex left edge (angle of 50 degrees) and similar wear on the concave right edge (angle of 45 degrees). A second flake had similar utilization wear on its convex right edge (angle of 60 degrees), as well as unidirectional retouch and use scarring on its proximal end (angle of 85 degrees).

Site PL 88A

This site was selected for individual analysis because it was reported to have a possible structure; associated with the site was a lithic scatter, which was sampled by collection. Separate analysis of the PL 88A collections thus may serve to extend the data base for structural sites in the Placitas area, while providing a detailed view of one of the largest collections from a non-excavated site in the Placitas project area (Tables 11-44 to 11-48).

Materials from this site included only obsidian (45 items) and a miscoded material (given as type 3600: "obsidian, Arizona?"); the latter probably was actually unidentified obsidian or vitrophyre (two flakes). Polvadera obsidian contributed 20% of the obsidian collection, Jemez types made up 74% and unidentifiable obsidian made up 6% of the collections. Obsidian with high cortex percentages made up a third of the collection.

Artifact types included flakes (31), a retouched flake, two angular fragments, two bifaces, a uniface, three cores, a scraper, two exhausted cores, two bipolar flakes and a retouched rock. Platforms on recorded flakes included three cortical platforms, six collapsed platforms, nine retouch platforms and an indeterminant platform. Cortical platform angles measured 65, 70, and 105 degrees; retouch platforms most commonly had angles of 60 and 80 degrees.

Size data for the PL 88A collections indicate that this assemblage of flakes is much more homogeneous in all dimensions than are other comparable data from this project. It is of a mean size comparable to the relatively small flakes of the pooled Atrisco data set in all dimensions except thickness. The Atrisco flakes are on average only about 70% as thick as the PL 88A collection.

Four utilized flakes recovered from this site were reported in the general data set. The first, of the probably miscoded type 3600 material, was reported as having unidirectional scarring utilization on projections along the left edge (edge angle of 15 degrees) and along the convex right edge (angle of 15 degrees). The second item was of Jemez obsidian. It had bidirectional scars and polish utilization (angle of edge uncoded) on proximal edge projections, together with unidirectional scarring utilization on its (80 degree edge) convex distal end. The third item, of Polvadera obsidian, had unidirectional use damage on its concave right margin (angle of 30 degrees). The fourth item, of Jemez obsidian, had bidirectional scarring and polish on its convex left margin (angle of 45 degrees).

The Remaining Placitas Sites

A total of 124 loci of 122 other Placitas sites will not be presented separately here. In total, 970 items collected from these sites were listed in the general artifact analysis files; that is, an average of 7.8 artifacts per locus. The sites described as a group in this section produced in no case more than 51 artifacts per locus. One site was reported to be structural, one of the others was suspected to be structural, and the remaining 120 sites were reported as small lithic scatters, quarry sites, or some combination of the two. The two potential structural sites together were represented by only ten artifacts.

The problematic aspects of these data are well illustrated by the listings from PL 5B. This possible Paleoindian and La Bajada Archaic site was collected on survey (77 items) and again in the course of testing (about 200 items) according to the summaries prepared by Bertram and Burgett (this volume). Nine hydration samples were submitted from this site. Yet the general analysis data files list only nine flakes, five bifaces, and a core from this site. In contrast, the special core analysis listing reports data from (a possibly partial) sample of six cores; the formal tool special analysis listings report the presence of 15 tools (certainly a partial sample). These discrepancies are as yet unresolved.

In the debitage data files from the pooled "other" sites, 99.7% of all debitage was obsidian (Table 11-49). This cannot be a reflection of site reality, but rather is the result of data loss. The only other material types reported were the problematic "Arizona obsidian" code (type 3600: two items) and Cochiti vitrophyre (type 3701: one item). Of the definite obsidians, 481 items were of Jemez types and 300 were of Polvadera obsidian. The remaining 186 were classified as types 3500 (clear gray), 3501 (clear, dark bands), 3502 (clear, [illegible] streaks), 3504 (dark green, spherulites), 3507 [illegible] white spherulites) and 3510 (Grants Ridge/Pu[illegible] Mountain, a vitrophyric obsidian).

Overall, 31.1% of the obsidian items collected from t[illegible] sites had over 50% cortex. Items with abundant c[illegible] were especially common in Jemez types 3523 and 3[illegible] Polvadera 3530, and inspecific type 3500. These[illegible] gether with Jemez type 3520, were the most abun[illegible] material types. The abundant cortex on these [illegible] surely must imply that they were collected from [illegible] secondary deposits and not imported from the Co[illegible] (3520 to 3525) or Chama (3530 and 3531) countr[illegible]

Flake platform data indicated that most platforms [illegible] absent, cortical, or faceted, but 23 retouch platforn[illegible] ground platforms and a single stepped platform [illegible] also recorded (Table 11-50). Cortical platform ar[illegible] appeared to have peaks of abundance at 50 an[illegible] degrees; the larger angle was much more comr[illegible] Faceted platform angles most often measured to va[illegible] near to 55 or to 65 degrees; both peaks were al[illegible] equally common. Retouch platform angles were [illegible] often measured as near 50, 65, or 80 degrees.

A wide range of artifact types were collected from t[illegible] sites (Tables 11-51 and 11-52). Recorded were [illegible] flakes, 121 cores, 69 bipolar flakes, 51 exhausted co[illegible] 34 tested cores and 17 items of angular debris. M[illegible] formal tools included 15 retouched flakes and 21 bif[illegible] as well as four retouched rocks, ten scrapers, [illegible] unifaces, a point and a denticulate.

Analysis of size data for flakes indicates that the po[illegible] non-structural sites at Placitas had flake size distri[illegible] tions which were less variable than the distributi[illegible] reported for the structural site flake assemblages, [illegible] the exception of the pure obsidian residual collecti[illegible] from PL 30A and from PL 88A. The Placitas obsid[illegible] flakes, then, are typically a little smaller and thin[illegible] than are flakes from non-obsidian material at Placi[illegible] See Table 11-53 for statistics on size of items from [illegible] pooled non-structural sites at Placitas.

Comparison was made of the artifact-type frequen[illegible] from those sites having substantial collections with [illegible] overall pooled frequencies for the full set of sites re[illegible] sented only by obsidians (Table 11-54). Results indic[illegible] that there is remarkably little difference in assembl[illegible] composition between the various obsidian-only Placi[illegible] sites. Only sites PL 2B and PL 63A seem to deviate v[illegible] strongly in any respect. Site PL 2B is somewhat poo[illegible] in flakes and richer in cores and bipolar flakes than [illegible] the other sites, while PL 63A is somewhat high in c[illegible] frequency. None of these differences is very strong. T[illegible] suggests that the varying sampling procedures and intensities applied at the Placitas survey sites and survey/tested sites did recover evidence of, and did not obscure, an underlying commonality of pattern. That pattern is exemplified in the remarkably good fit of observed and expected frequencies in the table.

Anticipating data and discussions presented later in this report, the pattern of obsidian reduction suggested for the "other" Placitas sites is quite different from the patterns found at Ball and Atrisco. The incidence of bipolar flakes, tested cores, exhausted cores and retouched flakes is anomalously high compared to the other sectors, while small angular debris and ordinary flakes are distinctly rare, especially compared to Atrisco. [The reader may wish to compare Tables 11-54 and 11-175 at this point.] The author would have supposed that the Placitas obsidian reduction industry was directed in part at the production and exploitation of biface cores, based on the common observation that projectile points are often made on obsidian even in obsidian-poor assemblages.

In comparison with the Atrisco assemblages (see that section, following), it would appear that the Placitas obsidian collections are somewhat poorer in bifaces and biface debitage than are the Atrisco biface-dominated sites, but that the Placitas assemblages have distinctly more biface trajectory waste than do the Atrisco core-dominated sites. Curiously, the Placitas obsidian sites also have substantially more core-trajectory waste than do all of the Atrisco site types except for the hillside, non-structural, core-dominated Atrisco sites, exemplified by site AT 8B. In fact, if the abundance of tested cores and exhausted cores at Placitas is also taken into account, the Atrisco sites have far fewer cores than do the Placitas obsidian assemblages from the non-excavated sites.

One might speculate that these patterns indicate that the Placitas obsidian assemblages are quarry assemblages, in which the relatively high abundance of bifaces reflects the relative ease of working obsidian compared to silicified wood and Santa Fe/Pedernal chalcedony, the dominant materials at Atrisco. Even where obsidian is found as tiny pebbles or in other forms difficult to work, it can be exploited using bipolar reduction, due to its exceptionally brittle conchoidal fracture properties. This fact probably explains the very high frequencies of bipolar debitage on the Placitas sites. However, the abundance of retouched and utilized flakes (much more than on any of the Atrisco site groups) would seem to argue against a pure quarry interpretation for these sites. Clearly, materials were being not merely quarried, but also used, on the Placitas sites.

Analysis of retouched and utilized flakes indicates that the Placitas obsidian utilized debitage collections are dominated by items bearing unidirectional utilization and polish (Tables 11-55a to 11-55d) on their left and right lateral edges. For left edges (43 cases), the most common such items were concavo-convex, convex and straight edges having edge angles of 40 to 50 degrees. Bidirectional polish and rounding was next most common and occurred on slightly less acute edges (45 to 60 degrees), but with the same edge forms. Utilization without rounding was surprisingly rare.

For right edges (54 cases), a strikingly different pattern was found. Again, unidirectional rounding and scars were the most common wear patterns. Convex and concavo-convex edges were most common, occurring in a multimodal range with peaks at edge angles of 25 to 30, 40 to 50, and 65 degrees. This angle distribution was echoed by the cases with bidirectional rounding and scarring, which was again the second most common wear type. This pattern peaked in the 30 to 40 degree range. Again, relatively few items lacked rounding.

For proximal edges, data were sparse (11 cases), but less acute angles appeared to be most common. Most such edges were convex or concavo-convex and had been retouched; less than half bore rounding wear.

For distal ends, the commonest wear form was again unidirectional scars with rounding on convex, straight and concavo-convex edges at low (about 20 degrees) edge angles and at moderate (about 60 degrees) angles. The less acute edges tended more often to be retouched than did the sharper edges. Once again, utilization wear without rounding was unusually rare.

The marked differences between left and right edges is probably best ascribed to differences in use patterns and motor habits. Southwestern Indians, like all humans, are almost all right-handed. The high frequency of rounding wear would indicate that relatively little work was done on hard or refractory materials. The high frequencies of wear on acute and intermediate edges probably indicates that the great bulk of these tools was used for cutting rather than scraping work.

This last statement is somewhat surprising. In the author's experience, assemblages with retouched and utilized flakes (except in kill sites and similar settings) tend to exhibit relatively little "soft" wear but far more "hard" wear. Soft wear produces abandoned edges which are rounded but not obviously crushed, stepped, or damaged. Hard wear results in substantial attrition and creates rather obtuse and jagged abandoned edges. This is especially true of obsidian, which is so brittle that it generally is almost self-retouching. Under all but the most gentle or undemanding application of force, obsidian edges will consistently collapse or exhibit marked and easily visible attrition. This fact alone argues that activities represented in the Placitas obsidian assemblages included a very high component of flake utilization in the course of processing soft goods, probably meat, hides and/or softer vegetal products. These sites, then, might best be considered as loci of retooling, quarrying, and food processing activities, all carried out in and near the local cobble and pebble obsidian sources. It seems likely that several hunting camps are included in the sites sampled.

The regularity of the artifact composition of the Placitas obsidian assemblages, then, would indicate that these sites were usually occupied as multipurpose stations or camps, which led to the deposition of redundant tool kits. Alternatively, the apparent sites are true isolate palimpsests created by many low-intensity visits, each of which was directed at quarrying or processing or retooling. The latter possibility cannot be ruled out, but seems less likely than does the former interpretation. In the latter case, the author suspects that rather more assemblage variation might be expected between loci more optimally sited for one activity or another.

Placitas Core Special Analysis

A selected subset of the cores recovered from the Placitas sites was intensively described and coded for computer analysis by Schutt (Joseph Tainter, personal communication). This data set included records on 140 cores. The procedures used by Schutt to select cores for detailed study are unknown. Although materials from six of the eight Placitas tested sites are present, their counts generally do not agree with field specimen log counts (Bertram and Burgett, this volume); over half the materials in the special core analysis came from sites collected on survey only.

Unfortunately, it appears that none of the cores from the excavated sites (PL 30A, PL 32A, PL 38A), or from the separately analyzed PL 88A (see above) were included in this analysis. Over half the special core analysis data base is made up of records on items recovered from PL 24A, a collected and tested lithic scatter associated with a small collapsed cairn (Bertram and Burgett, this volume). No data for any artifacts at all from PL 24A are recorded in the Placitas general lithic analysis listings, although Burgett (Bertram and Burgett, this volume) estimated from field specimen logs that over 3,000 items of debitage had been collected in the testing phase on this site and Schutt's formal tool analysis recorded 20 items from this site. Thus, the analyzed cores and formal tools may be the only lithic assemblage information available from this tested site.

The remainder of the Placitas core special stud base is composed of 63 records from 12 sites. Of tested sites included: PL 34A (two items), PL 35 items), PL 40A (three items), PL 51A (two items) 5B (six items). Other sites in this group were: PL 2 items), PL 29B (nine items), PL 33B (four items), (five items), PL 66B (three items) and PL 72B (four Of all the tested sites, the counts for the Schut base agree closely with Burgett's field specimen a catalog counts for cores only for PL 34A.

Because the core classification used by Schutt nized six different core types and 13 different m types in the Placitas collections, it was cons advisable to lump data from several sites for stud data from PL 24A were separated out into a site-s data base because testing phase collections fro rich reduction locus would be otherwise unstudie data from the remaining sites were lumped on ac of their site-by-site sparsity.

The most abundant core material type (109 cases Placitas was Santa Fe/Pedernal chalcedony 1054 type, together with its cotypes 1051, 1051, and made up 84% of the collections (118 items). material was about equally abundant at PL 24A a the other sites.

Only three other materials with greater than abundance in the Placitas special core analysis lis were found. Obsidian was found only in PL 23A a PL 5B; there were nine items of 3520 and one it 3530. Type 3700 vitrophyre/hornfels was found 24A (two items) and in PL 23A, PL 34A, and PL 35 item per site). Two items of silicified wood were 24A. Because there is strong reason to suspect t systematic typographical or computer error corr the 3700 material coding in this data set (see exte discussion in the Ball Ranch special core an section below), I am confident only that code represents hornfels, vitrophyre and/or basalt i Placitas core data base.

The 121 obsidian and other igneous cores report the Placitas general analysis listings for non-exca sites, which seem to represent only the obsidian co nent of those assemblages, are almost entirely ab from the special core listings. A few items appea both lists only for PL 23A, PL 51A and PL 5B. Site 29B, PL 33B, and PL 34B appear only in the special analysis listings, and not at all in the general listings. The remaining sites are represented in general listings by items other than cores. The re for this inconsistency is not known.

Core type abundances were distributed in fairly similar patterns in the two analytical strata of the Placitas special listings, although there may be minimally significant (chi^2 abundance p = 0.092) differences (Table 11-56). Multiplatform cores and tested cobble cores were equally abundant. Single platform cores were common, as were spent multiplatform cores. Bifaces and spent single platform cores were rare.

In cortical abundance, most materials tended most commonly to have about 50% cortex retained. Obsidian and hornfels/vitrophyre were slightly more cortical on average. Modal cortex abundance was lowest for multiplatform cores than for other types. An unresolved puzzle is the presence of a number of tested cores having low cortex coverage codes. The author cannot interpret this observation and would suggest that it may be another systematic miscode or computer error (Table 11-57).

Analysis of the distribution statistics for inferred sizes of product flake scars from the Placitas cores indicates (Table 11-58) that, for all types, the cores from PL 24A produced somewhat smaller, and consistently much less variable, flakes than did the aggregate of cores from other sites.

Closer examination of the product flake measurement distributions reveals (Tables 11-59 and 11-60) that the data from PL 24A and from the other Placitas sites are really rather similar. However, the flake size distributions from PL 24A are unimodal while the flake scar measurements on cores from other sites are typically bimodal. This may suggest that standard flake lengths were indeed sought by a single group or family at a single locus, but that variation in activities, material size availability, or personal preferences induced variation between sites.

Moreover, the PL 24A pattern of flake scar sizes is present elsewhere in the collections, possibly implying that similar occupations or activities were present in other sites in the collections as well. If this speculation has merit, it would suggest that a more detailed study of assemblages might reveal that flake size regularities within a single occupation were commonplace. If this could be demonstrated, it might allow advances in functional interpretation and an improved resolution of the problem of recognizing multiple occupation components in lithic sites.

This approach might have value outside a local comparative framework as well. Comparing the flake size distributions for Ball and Placitas, it is clear that the characteristic peaks of the PL 24A distributions are mostly echoed in the Ball assemblages, as are the frequency trends from the other Placitas sites. If the assemblages from PL 24A and the other Placitas sites were combined, they would closely approximate the Ball trends, even though the local material selection patterns are quite different in the two areas. Since there is little reason to suppose synchrony in occupational intensity through time in the two areas, it is unlikely that mere cultural factors are the explaining factors in these pattern similarities.

Further comparing Ball and Placitas, examination of cores in the two areas for the distribution of flake scars per platform (Tables 11-61a and 11-61b) indicates that cores from the other Placitas sites were less heavily exploited than those from PL 24A, which in turn were noticeably less heavily reduced than those from Ball. On the weak argument from similarity with the undoubted residential collections from Ball, this pattern would seem to imply that PL 24A was more than a simple quarry, but perhaps some sort of special activity or even habitation site. On the whole, the lower degree of core exploitation of the other Placitas sites accords better with the author's expectations for a quarry or initial reduction workshop than does the degree of exploitation characteristic of PL 24A.

The Placitas Chipped Stone Formal Tool Data Set

The Placitas formal tool special analysis is based on data coded by Schutt, according to a protocol of her own design. As for other data sets discussed in this chapter, the formal tool data set for Placitas was made available to this author both as ASCII data listings in MS-DOS format and as summary printouts and listings. Inconsistencies were found in comparing the paper and electronic copies of the data sets. Omissions or sampling deletions may also have been identified in comparing the special analysis data sets with the general analysis data set and the original field notes. Because these factors may limit the range of approaches possible in the presentation of the Placitas formal tool data, they will be described here briefly.

There were 101 records in the electronic copy of the Placitas formal tool data base and 127 records in the paper copy of the same data base; of these, a total of 59 valid records were assigned to only four sites. These four best-represented sites were PL 24A, PL 30A, PL 34A and PL 5B. The data for these sites were examined in detail to assess the consistency of the data base vis-a-vis other sources on Placitas lithic recovery, and to attempt determination of the nature of sampling procedures for the descriptive formal tool restudy.

The formal data sets include no records for PL 32A, one of the two important excavated sites at Placitas. This appears to be consistent with the general lithic analysis listings for this site. The other excavated Placitas structural site, PL 30A, had numerous formal tools reported in the general lithic listings. Of these, only four items are listed in the electronic copy of the formal tool data set and only thirteen tools are listed in the presumably identical paper copy. In both cases, three artifacts are duplicated (duplicate unique item numbers) with slightly different values for typological, production stage and descriptive codes and for metric measurements. It is presumed that the duplication represented earlier and later coding sessions. The variant of each duplicate pair which coded a less advanced production stage (i.e., the one with less detailed reporting) was deleted from further discussion, as Schutt's procedures are known to have included setting refractory or borderline items aside for reanalysis. The author follows this same practice and finds that it has sometimes led to duplicated and/or inconsistent coding. The valid cases in the paper copy of the special analysis file list only obsidian bifaces and bifacial tools and include all the records found in the electronic file; the paper version of all records will be relied on in the following discussion.

No complete projectile points, only two projectile point fragments and no unifaces, scrapers, or other chipped stone tool types were listed for PL 30A. No material types other than obsidian were coded for that site. It is certain that PL 30A produced at least five complete obsidian arrow points, other projectile points and bifaces and choppers made of a range of materials. These complete finished tools were evidently not selected for detailed analysis.

Site PL 24A, which was absent from the general analysis listings but which contributed half of the special core analysis listings, was represented by 20 items in the paper copy of the formal tool special analysis. All data from this site were absent from the electronic copies of the formal tool data base. It is thought that the PL 24A records were inadvertently deleted from the computer files after the most recent printouts were made.

Site PL 5B, which was listed in the general analysis files as having contained only nine items (eight flakes and a core), was reported in the special core analysis files as having yielded six cores of several material types. In the formal tool listings, 15 tools are described for this site. No resolution of this incongruity is suggested here.

The material types for formal tools from site PL 34A were recorded in ten of eleven cases as being types 3700 to 3704 (i.e., vitrophyres). There may be a problem in this data set with transposition of codes for vitrophyre and hornfels. This problem occurs in all of Schutt's data, but is discussed in detail only in the Ball Ranch se this chapter, where it affects over 50% of th assemblage. The field notes for survey of this s also the compilation of data prepared by Bertr Burgett (this volume) indicate that a range of c and tool materials were recovered here; these i (field identifications) mostly basalt with an admi chert, chalcedony and obsidian. A "basalt knife point midsection were also collected, according notes. Inspection of the photographs indicates least some of the items appear to be made <u>granular basalt</u>, almost certainly not vitrophy most probably not hornfels. Therefore, the a usage of Warren codes 3700 through 3704 probably be read, for the Placitas data at le "vitrophyre <u>or</u> hornfels <u>or</u> basalt" until further d forthcoming.

The remainder of the data in the Placitas form special analysis files (i.e., from sites represented or fewer items) seems to display good agreeme tween the paper and electronic versions and als the general lithic analysis listings and field notes ever, the substantial incongruities between th from various sources available for sites PL 24A, P PL 34A and PL 5B suggest that a non-random sa scheme may have been implemented in the selec items for description in both the general and s analyses. Computer coding and operational which caused data losses may have further affect sampled data. For these reasons, the author w attempt statistical summaries or comparisons Placitas formal tool data. Rather, the collection some individual items) for which information is ava will be described.

The Placitas formal tool sample collections cod Schutt (Table 11-62) contained mostly bifaces (62 c biface/projectile points (16 cases) and uniface cases) from 49 sites. Other items in those li included only two unidirectionally retouched piece two gravers. Obsidian was the most common ma with 59 cases distributed rather uniformly over 37 Next most common was Santa Fe/Pedernal chalce with 30 cases, of which 17 were from PL 24A. Third common was the problematic hornfels/vitrophyr salt type 3700, with 20 cases, half of them from PL The fourth most common was the group of other c and chalcedonies, with 13 cases, nine of them fro 5B. Other materials included fossil wood (two ca basalt type 3400 (two cases) and an undocumented 9998 (one case).

Size statistics were compiled for the complete tools the Placitas formal tool data base (Table 11-63). cases found only in the paper listings were added t electronic file cases for this study. Note that Sch ferences regarding biface reduction stage and stage of oduction are broadly borne out by the mean values for ank, early stage, late stage, preform and finished ojectile point bifaces. Each stage is typically smaller at least no larger in dimensions than was the preced- g stage.

nly 14 of the Placitas data set formal tools bore any ortex. Of these, eight were unifaces, one was a graver, vo were early stage bifaces and three were later stage faces. Of the five cortical tools from site PL 24A, four ere Santa Fe/Pedernal and one was fossiliferous chert. f the nine cortical tools from other sites, none was of anta Fe/Pedernal, one was fossiliferous chert, three ere of hornfels/vitrophyre/basalt and five were of osidian.

pparently, no functional angle data were ever recorded r Placitas tools, although provision was made for this ode in the format. Use angles were recorded for 13 ems; wear types were recorded for 12 of the 13. An arly biface was recorded as having a use angle of 61 egrees associated with secondary use, but no primary se was coded. A uniface was reported to have unidirec- onal hard wear, but no use angle was recorded. In all ther cases where use wear was noted, the associated se angle was measured and vice-versa.

ard unidirectional wear was reported for six unifaces; ssociated use angles were 40, 40, 45, 60 and 70 egrees. The low use angles were on obsidian, on an nknown material, and on vitrophyre/hornfels/basalt. he higher angles were on Santa Fe chalcedony and on itrophyre/hornfels/basalt.

hotographs for a number of Placitas formal tools were ocated. Many of these were items not included in chutt's detailed description sample. These are keyed to escriptions and photo log data in Table 11-64.

he most evident omission from Schutt's analysis was hat most of the complete projectile points were not onsidered. Based on photographs, these can be dis- ussed here. Discussion will take the perspective resented by the author (1987) in a recent Pecos confer- nce symposium presentation based on his recovery of umerous very late dates for obsidian dart points asso- iated with obsidian arrow points which were made from hemically identical materials and which dated contem- oraneously.

Corner-notched and side/corner-notched arrowpoints i.e., analogs to the Early Prehistoric Plains Scallorn, Deadman's and Keota types) appear in the Southwest arly on, but are not common until the Pueblo I period n the San Juan Basin. They probably date occasionally to as early as the introduction of the bow (perhaps by A.D. 200), but they are most common in Basketmaker III and later sites. Illustrated examples of the possibly earlier corner-notched (Scallorn-Deadman's) type include PL 5B #1 and PL 30A #140, miscoded in the files as a common biface. The possibly later side-corner notched, convex-based (Keota-like) type is illustrated by four examples from PL 30A (Numbers 62, 179, 227, and 263). The generally later (Pueblo III to protohistoric) arrowpoint style, classified by Schutt as a "Plains" point, but actually rather common in later San Juan Basin Anasazi, eastern Anasazi, Pueblo and Navajo sites, is illustrated by PL 40B #8. This point type would most commonly be given in New Mexico as being of the "Pueblo III," the "Reed," or the "Harrell" types (see also Thoms 1977).

Items not assignable unambiguously to the later occupations in this area include two items which, on haft width, cannot be referred to either dart or arrow points. These are PL IF-92A #1 and PL 30A #163.1. The author found similar tools to have been manufactured between about 500 BC and AD 1100 at Abiquiu Reservoir; recent work in southern New Mexico seems to confirm this date range rather well (R. S. MacNeish, personal communication). A similar date range applies in both the author's and MacNeish's studies for the putatively Late Archaic/ Basketmaker/En Medio types of dart points. These are as follows: PL 4A #1 is a corner-notched "En Medio/ Basketmaker" point; PL 22A #1 is an "Osharan" concave-stemmed variant; and PL 104A #1 is a "Gypsum/ San Augustin" contracting-stem point or preform.

Probably much older points were also found in the Placitas area. Schutt coded in her data a Cody Complex PaleoIndian point from PL 5B (item 9) (C. Haecker, personal communication). Since I could find no illustration of it, this identification could not be verified. Photographs of two items which the author would classify as "La Bajada" (early and mid Archaic and probably also later) type are PL 38A #57 and the fine typical La Bajada point obviously mislogged in the photograph files as coming from "PL 3C #7" (a nonexistent site). Schutt gives a third La Bajada point designation; she would so type the pointed biface fragment from PL 34A #7. The author would call this fragment a biface, but would acknowledge that it could be a La Bajada tip lacking all the diagnostic haft elements.

Placitas Groundstone Data

A small separate data file contained the records of Schutt's groundstone analysis. Data in this file included only materials from PL 30A (eight records) and PL 32A (ten records).

From PL 32A were reported a total of one fragmentary and two complete slab metates, two whole grinding slabs, a pot stand fragment, two whole two-hand manos, a one-hand (bun) mano and a shaped stone. All but one of the coarse-grained metates was reported to be made of material type 2000 (generic sandstone); the odd item was listed as material 4000 (generic metaquartzite).

All eight items from PL 30A were reported to be generic sandstone. They included two slab metates, two two-hand manos, two one-hand manos and two grinding slabs. Complete items were one of the grinding slabs, a two-hand mano and both one-hand manos.

A more diverse range of grit sizes was reported for the tools from PL 32A, but the two assemblages are not otherwise very different (Table 11-65).

Placitas Summary

The Placitas obsidian general collections appear to represent debris produced in the course of quarrying. This activity (judging from the retouched and utilized flake data) apparently was often combined with processing and/or manufacturing activities that entailed the cutting of relatively soft materials, such as hides, meat and relatively soft vegetal materials. Little evidence was found for heavy wood working, antler working, or other activities demanding the production and use of abrupt edges under considerable stress.

Data on cores and on formal tools made from materials other than obsidian is available from numerous sites, but debitage data from these sites come only from obsidian items; comparisons of cores, tools and debitage are therefore difficult. Cores were almost exclusively of Santa Fe/Pedernal chalcedonies and cherts. The core assemblage reported from one site, PL 24A, was separated out for comparison with pooled core assemblages from the remaining Placitas sites. PL 24A was found to have somewhat smaller, more intensively exploited cores and somewhat smaller product flake sizes, than did the other Placitas sites. In general, the Placitas cores (including those from PL 24A) were larger and less intensively worked than cores from Ball Ranch.

The Placitas formal tool assemblage was dominated by obsidian items, but a wide range of non-obsidian tool materials were also represented. Bifaces and unifaces/scrapers made up almost all the described formal tools. No statistical summary of these items was made because of comparison, sampling and representation problems.

Ball Ranch Sector Collections

The Ball Ranch assemblages, which were collec[ted] during survey, were not sufficiently rich to justif[y] [a]nalysis of materials on a site-by-site basis. From [the] sites recorded on the Ball survey, a total of 733 ite[ms] collected (5.86 items per site). The three riche[st] were represented by 26, 25 and 22 items. An ad[ditional] 18 sites were represented by 10 to 17 items p[er] Seventy-seven sites were represented by five c[r] artifacts per site. It was evident that no valid sta[tistical] site-wise comparisons could be achieved with [the] data.

At the suggestion of Joseph Tainter, a pooling s[trategy] based on stratification according to the prese[nce of] structures was adopted. This allows the compila[tion of] sufficiently large comparative samples to permit [statis]tical assessment. The Ball assemblages clearly in[clude] a few sites with possible Archaic components, bu[t most] sites were thought to be of Early to Middle Pueblo [age].

The field director of the Ball survey has prese[nted a] preliminary analysis of the Ball site location[al and] assemblage data (Haecker 1987). It indicates tha[t most] of the Ball sites may be interpreted as eithe[r field] houses, non-structural agricultural locations, o[r sup]port loci related in some way to agricultural act[ivities]. Accepting Haecker's view, examination of the a[ssem]blage difference between structural and non-stru[ctural] loci was judged to be an appropriate and reas[onable] research problem for the Ball phase of this inqui[ry].

The original field notes for the Ball Ranch surve[y were] consulted to determine the probable structural as[socia]tions of each of the Ball sites. The surveyors were [found] to have reported a total of 76 sites as having proba[ble or] definite structural associations. These sites were [sepa]rated from the 49 non-structural sites. This pro[duced] two analytical strata, the pooled assemblages of b[oth] which will now be described and compared.

Material Types

The pooled assemblage from the Ball structural [sites] (334 items, or 46% of the total assemblage of 733 [was] dominated by hornfels types 4350-4360. No [other] material type or type class was as common as this material (183 pieces, or 55% of the 334 structural assemblage). Hornfels was about equally common [(212] pieces of 399, 53%) in the non-structural assem[blage] (Tables 11-66 and 11-67). In both assemblages, [horn]fels was present in all stages of reduction. In struc[tural] sites, hornfels tended to be most common as items [with] little cortex; in non-structural sites, items with no c[ortex] were most common. In both assemblages, items with very high cortex were slightly more common than items with abundant cortex.

The Santa Fe/Pedernal chalcedonies were the second most abundant material group in both assemblages. In both cases, they were only about a fifth as abundant as hornfels. Over three-fourths of the chalcedony items had little or no cortex.

Obsidians were the third most common material phylum in non-structural sites, but only the fifth most abundant phylum in structural sites. In both assemblages, obsidians were typically found as decorticated materials. Obsidian with no retained cortex was relatively much more common in non-structural sites than in structural sites.

Silicified woods were the third most abundant phylum in structural sites and the fourth most abundant in non-structural sites. Items of these types with abundant to high cortex were relatively much more common in non-structural sites.

Red and gray jasperoid cherts (types 1430 to 1436) were fourth most abundant in structural sites and fifth most abundant in non-structural sites. These materials either were noncortical or else retained little cortex in almost all cases.

Excluding those materials already discussed, a total of 54 items comprised of 25 individual material types made up the remainder of the non-structural assemblage. The structural assemblage was similar, with 57 other items of 22 material types. On average, the rarer materials most often had little or no cortex. Great variance in this character was present within these collections.

Pooling all the rare materials, the total count for noncortical items was less than the count for items with little cortex (17 vs. 21 pieces) on structural sites. On non-structural sites, the trend was strongly reversed (36 vs. 11 items). In both cases, the proportions of items with substantial cortex to the items with little cortex are more nearly equal (24 to 21 structural vs. 18 to 11 non-structural). Using ordinary chi-square and Fisher's exact tests, the distinction in no cortex versus little cortex is significant at $p = 0.003$. The difference between the low and abundant cortex is not significant ($p = 0.459$).

Artifact Types

In both assemblages, flakes were far more common than any other artifact type (Tables 11-68 to 11-71). Cores were typically only a fifth to a tenth as commonly collected as were flakes. In structural sites, obsidian cores were strongly over-represented relative to obsidian flakes; from non-structural sites, no obsidian cores at all were collected. Compared to flakes, hornfels cores were relatively far more abundant on structural sites. On non-structural sites, cores of chalcedony and of the pooled rare materials were over-represented in comparison to flakes. Cores of the jasperoid cherts and silicified woods were relatively uncommon in both structural and non-structural assemblages.

Retouched flakes were a persistent but rare component of both Ball assemblage strata. The only clearly deviant patterns in material abundance for this type were in the rare materials on structural sites, where 15% of all rare material flakes were retouched, and in hornfels from both site types. Hornfels flakes were retouched 2% of the time on structural sites and only 0.6% of the time on non-structural sites. Flakes of other materials typically were retouched five to ten percent of the time on sites of both types.

Scrapers and denticulates were important minor assemblage components in both assemblage strata, each type accounting for between 1% and 2% of the assemblage. The denticulates on both kinds of sites tended to be made of hornfels. On non-structural sites, scrapers were made on Santa Fe/Pedernal chert, jasperoid chalcedony, and rare material types with about equal frequency. On structural sites, scrapers were made on the chalcedonies, rare material types and on hornfels.

Bifaces were more common on non-structural sites, where they were made of chalcedony, obsidian, hornfels and rare materials. Only two bifaces were recorded for structural sites; these were of obsidian and hornfels.

Edge Angle, Platforms and Reduction

Faceted platforms, cortical platforms and retouch platforms were present in similar proportions in both strata of the Ball general data set (Tables 11-72a to 11-72c). There are no significant differences in abundance across strata for platform types ($chi^2 = 0.72$ at $df = 6$: $p = 0.682$). There are, in contrast, important differences in platform angles. Cortical flakes from structural sites almost all had platform angles very near 60 degrees. Cortical platforms from non-structural sites were variable, with statistically suspect peaks at 25, 55, 65, 75 and 105 degrees, but with a much greater dispersion than was present in the structural sites. Faceted platforms in both site strata were variable, with abundance peaks of 30 degrees (both), 45 degrees (non-structural) and 60 to 70 degrees (both). The few retouch platforms at structural sites again clustered at 60 degrees. The retouch platforms from non-structural sites varied from 40 to 60 degrees in platform angle.

Flake size was little different in the two Ball Ranch pooled assemblages, in spite of the difference in technology of flake reduction from structural and non-structural strata (Tables 11-73 and 11-74). The only possibly significant differences found were that flake thickness and weight tended to be somewhat greater on structural sites. Of course, the Ball flakes are clearly less variable but larger and heavier than Placitas flakes from structural sites, and very much larger in all regards (and probably also more variable) than the obsidian debitage from Placitas non-structural sites.

These trends may reflect mainly the greater abundance of large material units at Ball and the greater toughness of the dominant material, hornfels. Obsidian flakes often shatter when struck or they break in use, but hornfels flakes tend to be much less brittle. Note that no account was taken of flake completeness in these calculations. This probably induced a bias downward in the flake size estimates for Placitas, which was dominated by obsidian debitage to a greater degree than Ball. Remarkably, considering that flake fragments were included in the computations of means, the flake size trends for Ball indicated also that flakes tended to be substantially larger than the recorded flake scar sizes for associated cores. This trend was interpreted as signifying the export from the survey area of larger and more promising cores and material blocks, with abandonment on site of a core assemblage composed mostly of smaller and/or less desirable cores and cobbles.

Ball Utilized Flakes

A relatively high proportion of the Ball debitage exhibited some form of retouch or utilization wear. Of the theoretical maximum of 2,400 possible use sites (600 debitage items other than manuports times four use sites per item), a total of 63 use sites (2.6 %) were recorded as worn and 51 use sites (2.1 %) were fully documented and correctly coded (Tables 11-74 to 11-79).

The most common edge shapes for utilized debitage edges were convex and straight, with all other edge shapes being only a third to a fourth as common as the two dominant shapes. All worn proximal edges were merely utilized, but nearly a quarter of the left edges, over a third of the right edges and over half of the distal worn edges were judged to have been deliberately retouched. Right edges were most commonly retouched bifacially, while unifacial retouch was more common on left edges, and was nearly ubiquitous as the re mode for distal ends. This may only indica unsurprising right-handed motor pattern preferen right-edge knife use versus left-edge scraper use. preference is conditioned by the curvature of flake the relative comfort of gripping in performance of forceful scraping versus somewhat more gentle cu tasks.

Unidirectional debitage microwear was almost tw common as bidirectional microwear; surprisingly scars were accompanied by rounding/polish wear 60% of the time for both unidirectional and bidirect cases. Although tools with unidirectional scars rounding tended to have more abrupt edges tha tools displaying only unidirectional scars (a trend sibly due to erosive wear creating more abrupt edg more heavily used tools), this pattern was abse reversed for bidirectional wear. Perhaps this indi a different attrition mode for more acute, and h more knife-like, edges.

In general, edge angles of 40, 60 and 80 degrees rather more common than were intermediate and treme angles. Use wear placement on left, on right, on distal edges was equally common. Each of these was used almost four times as often as was the prox end of debitage items.

Perhaps reflecting the generally more obtuse an present on flake proximal ends, utilized proximal e were typically more obtuse than were edges at o locations on debitage pieces. Distal end use seem have been more directed toward abrupt angle use, w left and right edges were more acute.

Tool angles on concave edges were most commonly c to 65 degrees; polishing was more common on the n abrupt-edged pieces. Straight edges tended more c monly to have 40 to 50 degree edge angles; polishing generally uncommon on straight-edged items of typ edge angle. Projections and concavo-convex edges ten to have relatively acute edges; polish on both types be more common on more acute edges. No clear tr in acuteness was observed for convex, notched, denticulated edges. Notches were never polished, denticulates and convex edges were always or alm always polished.

These trends may be more closely examined by comp ing the used/modified flakes from the structural site those from the non-structural sites (Table 11-80). E though sample sizes are rather small, certain tre may be detected in these comparisons. Non-structu sites, in general, had somewhat more acute angles utilized edges than did structural sites. Used right ed were typically more acute than left edges in both strata and proximal edges were consistently obtuse, but distal edge trends were not consistent between strata. Unifacially retouched distal ends were more common in structural sites. Reflecting the trend for utilized right edges, unifacially retouched right edges were found only on non-structural sites. Bifacially retouched edges, everywhere rare, may have been more common on structural sites.

There were 50 non-debitage utilized items from the general Ball data set. This data set included three additional small angular debris pieces which were not coded with the debitage; one was polished, one was worn and rounded unidirectionally and one was coded as a possibly utilized piece. A retouched small angular debris item was reported as having unidirectional use scarring. A retouched rock was coded as bearing edge polish.

Battering was reported for a hammerstone, two choppers, an axe, seven core/hammerstones and two flakes from core/hammerstones. Abrasion was seen on two cores, a side-notched tool, a perforator and a denticulate. An item coded as artifact type "other" was reported to bear striations. Polish, pecking and striations all occurred on one core/groundstone fragment.

Nibbling and abrasion were recorded for two more denticulates. Stepped and abraded wear were seen on a biface, two unifaces, a perforator and nine scrapers. Simple polish was recorded for three bifaces, another perforator, two more scrapers and two more denticulates. Non-specific probable wear was reported for a final pair of bifaces.

It appears that the activities on non-structural sites entailed more cutting employing unifacially retouched and utilized flakes than did the activities on structural sites. The latter sites saw activities more oriented toward work requiring more obtuse edges. Wear placement observations, which are as yet not fully understood, indicate that cutting activities were more likely to be done with right flake edges, while scraping and other work was more likely to be done on left edges. Of course, some of the more obtuse left edges may not indicate edge use, but rather may be evidence of backing for right-edge cutting tools. These two types of edge damage are not easily discriminated, in the author's experience.

One should not infer that the non-structural sites are necessarily earlier as a consequence of the cutting/scraping dichotomy. One must suppose instead that Puebloan hunting and special-use processing sites might easily have entailed the same need for cutting tools that was doubtless characteristic of earlier non-structural sites. The used/retouched flake data differences between structural and non-structural strata do seem to indicate that the field crews' observations on the presence or absence of structures were relatively reliable.

Ball Core Special Analysis

Although 65 cores and core-related items were reported in the Ball Sector general lithic analysis files, a total of 75 cores and core-related items were subjected to special analysis by Schutt as part of the core specialized study. This number included 17 isolated occurrences, eight items not originally classified as cores and 51 items classified as cores in the general study. The analytical status of 14 items classified as cores in the general study which did not appear in the core special analysis files is not known. Presumably they were excluded as an undocumented sampling decision or were judged by Schutt not to be cores. Of the eight items not originally classified as cores, two were unattested in the general file, two appeared to have been miscoded as flakes (code 1) instead of cores (code 10), two were first coded as denticulates, one was coded as a flake from groundstone and one was coded as a chopper.

As noted, the general lithic data files from Ball Ranch were split for analysis into two data sets according to the presence or absence of structural associations. This author elected to analyze the Ball core data set as one assemblage. That was because the Ball core special analysis included a substantial number of isolated occurrences and because the Ball general analysis indicated that no profound differences existed between structural and non-structural sites (differences in the aggregate being a matter of degree in most cases).

This analysis is more intensive than most of the analysis presented for Atrisco or Placitas simply because intensive analysis is, in the author's judgment, more justified and more potentially worthwhile for the more coherent Ball data set. It is unlikely that the Ball SCA data will support intensive stratified analysis, because of the sampling problems discussed above, but they clearly merit intensive analysis at the more inclusive and less sampling-sensitive sector level.

Examples of all eight of Schutt's core types were reported from the Ball collections (Table 11-81). Multiplatform cores were typically made from vitrophyre/hornfels (see discussion of this identification below) or from material codes lower than 1600 (i.e., cherts, fossil woods and chalcedonies). Single platform cores occurred most often in the sandstones, quartzites, igneous and metamorphic rocks. Biface cores were made exclusively of vitrophyre/hornfels, Santa Fe chalcedonies and 1112 fossil wood.

Examination of the data recorded on material types identified in the core special study indicated that a significant miscoding or computer programming error has affected the coding of the major material type from the Ball Sector (53% of the pooled sites' assemblage, about 14% of the formal tool assemblage and about 46% of the pooled core assemblage) in the specialized core study (see Table 11-82). The material types coded as hornfels (numbers 4350, 4351, 4352, 4360) in the general study were coded as vitrophyre (Warren #3700) in the core analysis and in the formal tool analysis.

Review of the field notes (some written by A. H. Warren herself) and discussions with participants in the Ball survey and general lithic analysis leave no doubt in this author's mind that the material which dominates the Ball assemblages was not vitrophyre but hornfels. However, genuine vitrophyre was also present at Ball in very small quantities, so one cannot simply read Schutt's vitrophyre codes as a systematic error for hornfels.

One cannot lump the two categories, either. Vitrophyre is a brittle rock which behaves under working and use in a manner intermediate between obsidian and basalt. Hornfels is a rather tough but soft material with working and use properties intermediate between dolomite and orthoquartzite. In the following presentation, this material will be referred to as vitrophyre/hornfels to emphasize that some vitrophyre may have been unavoidably lumped into the hornfels category as a consequence of the error. The reader should be aware that any interpretation based on material properties is subject to question, given the working differences between these two materials.

The overall abundance patterns of the materials identified in the core special analysis, then, appear to differ from the core component of the general material analysis in terms of the hornfels/vitrophyre matter. They also differ in terms of the relative abundances of igneous and metamorphic rocks in general. No comparisons will be made between the special core analysis material pattern and the general lithic assemblage pattern, as different analysts using non-comparable criteria seem to have made the two sets of identifications.

Cortex presence varied between the different material types represented in the special study Ball cores (Table 11-83). Although sample sizes were too small to define clear trends, it appears that cores made from material types 3700 (4350-60) and 3050 were consistently somewhat less completely decorticated than were cores of other material types. Possibly, cores of material type 1112 were also less cortical on average than was the general collection, which overall tended to show less than 50% cortex.

Examination of the frequencies with which cor[e]
worked in irregular vs. bifacial mode, and from
several platforms, indicates that single platfor[m]
multiplatform ordinary cores may be sequential
gies aimed at producing a single flake produ[ct]
Biface cores, on the other hand, represent an alte[rnative]
approach to flake production which produced su[bstan]tially smaller flakes that were generally more u[...]
than were the simple core flakes (Tables 11-84 a[nd]
85). The distribution of flake lengths produce[d by]
different core types suggests that cobbles were s[...]
on the basis of their expected product flake size, a[nd]
they were discarded when this target flake size c[ould no]
longer be produced (Table 11-86).

Flakes from exhausted cores average about five
millimeters shorter than modal flakes from usable
The apparent bimodality of flake sizes for core t[ypes 1]
and 2 (major peak at 20 to 25 millimeters, minor p[eak at]
30 to 35 millimeters) may indicate cobble selectio[n or]
target size differences in two different strateg[ies or]
periods, but it may also be happenstance. Small s[ample]
size and lack of enough supporting data prevent f[urther]
consideration of this observation.

It is somewhat surprising that flake lengths for
actually analyzed from the Ball sites tended
significantly longer on average than were the
lengths reconstructed from measurements on de[tach]ment scars of cores (36 millimeters vs. 14 to 28 millim[eters]
in average length). However, the length measure[ments]
for flakes included flake segments and fragments
the scar measurements from cores presumably ref[lect]
complete product flake lengths. Even the flakes
from tested cobbles were typically on average se[ven or]
eight millimeters shorter than the average for a[...]
flake lengths, although tested cobbles might be exp[ected]
to produce longer flakes than could have been reco[vered]
from more decorticated and hence typically sm[aller]
prepared cores. This pattern may indicate that l[arger]
material blocks (usable as cores) quarried withi[n the]
Ball area were carried out of the area after exploit[ation]
or testing, while smaller and less promising cores
abandoned in the area or left on sites as site furn[iture].

Examination of the distribution of numbers of pr[oduct]
scars per platform for simple cores seems to inc[dicate]
that multiplatform cores tended to have few pr[oduct]
flakes detached from each platform. Single-pla[tform]
cores tended often to have multiple detachments fr[om a]
single platform (Table 11-87). Perhaps this indi[cates]
that the formation and use of multiple platforms [was a]
strategy employed primarily when the first platfo[rm to]
be established proved to be unsatisfactory.

Formal Tools from the Ball Sector

Formal tools from Ball Ranch, analyzed as part of the formal tool special data recording by Schutt, included 26 tools from 17 sites. Only sites BA 3C (with six items), BA 23C (three items) and BA 9H (three items) had more than one artifact each included in this study.

Tools that were listed in the Ball special formal tool listings included nine unifaces, six early bifaces, three late bifaces, three bifacial tools, two gravers, two fragments with unidirectional marginal retouch and an item coded as tool type 3.3 (biface/projectile point: late stage biface - presumably a preform).

Materials represented were diverse. Four types of obsidian were present among seven bifaces and a uniface. The problematic 3700/4350 hornfels/vitrophyre was represented by seven pieces: three bifaces, two unifaces and two gravers. Santa Fe/Pedernal chalcedonies contributed five items: three unifaces and two early bifaces. All of these were probably heat-treated. A uniface and the two unidirectionally retouched items were made on silicified wood; the uniface and one edge-retouched piece were reported to be heat-treated. The other heat-treated item was a jasperoid chert uniface. The material type of one uniface was not identified in the special analysis, but the GLP analyst judged that it might be Alibates chert. The last item from the Ball special analysis lists was a trachytic felsophyre early stage biface.

Three of the five early stage bifaces were fragmentary, as were all of the three late-stage bifaces, two of the three bifacial tools, two of the nine unifaces and one of the unidirectionally retouched items. All other tools were reported to have been complete.

Unidirectional hard use damage was reported on a 60 degree edge of a uniface from site BA 9H. No other edge angles or wear data were recorded.

Measurements on length, width and thickness were reported for all of the Ball Ranch formal tools. Statistical summaries of these measurement data are presented in Table 11-88.

Not included in the detailed formal tool data base compiled by Schutt are some of the more distinctive and interesting of the tool types collected from the Ball sector, especially hoes, possible *tcamahias*, large notched axes and bifaces and mauls. In the interest of more completely conveying the character of the Ball Ranch formal tools to the reader, a selection of the photographs and drawings of artifacts prepared in the course of the Ball Ranch work by USFS staff is appended to this document. Every effort has been made to locate illustrations of the specific artifacts described by Schutt. Those artifact types not included in her analytical sample are represented in some depth in Table 11-89). No good core illustrations were found.

Ball Sector Summary

The greater abundance in non-structural sites at Ball of exotic or rare materials, of noncortical flakes from these materials, and of bifaces is probably ascribable directly to the greater mixing of Archaic and Early Formative materials in non-structural sites. It may also reflect traveling or hunting activity loci left by later Formative (i.e., Pueblo III and Pueblo IV) people or non-Puebloan trading partners. When they were traveling or hunting, it is reasonable to assume that typically intelligent and technically adept Anasazi adopted a technological system better adapted to mobility (i.e., an Archaic-like system). This is better adapted to mobility than the system used when they were operating within the less restrictive confines of their facility-rich and well-tooled home bases (cf. Tainter and Gillio 1980; Elyea and Eschman 1983; Elyea and Hogan 1983; Bertram 1987b).

There can be little doubt that the Ball Ranch Anasazi were capable of this technical leap into mobile biface-based technology. The greater abundance of relatively large, bifacially retouched, right-edge cutting tools on structural sites than on non-structural sites may be taken as an indication that the Pueblo IV folk at those sites certainly controlled some aspects of biface technology more than adequately. These tools may have been the non-mobile home base tool equivalent of bifaces, which may have been reserved for more extended logistical forays and for long-range travel.

The greater Tano (Galisteo Basin) region was settled intensively in Pueblo III times and abandoned only in the historic period. That settlement was at most periods concentrated heavily only along major watercourses and at springs. Most of the basin was not directly occupied by sedentary folk except during certain short periods (cf. Lang and Harris 1984; Haecker 1987). Excluding these rare periods, much of the Pueblo III - Pueblo V exploitation of the Ball area would have occurred in the course of traverses, hunts, or foraging expeditions.

We must not assume that the tool kits and technologies used by Puebloans in these contexts were at all similar to those they used at home. We may not assume that the non-structural Ball sites simply represent non-biface-based activity loci pertaining to the period of densest occupation of the Ball Ranch area, but often overlying a sparser and earlier biface-based Archaic occupation. The Archaic is probably represented at Ball, but we do not yet know enough to separate it from those Anasazi assemblages with a strong biface reduction component. The latter are probably also represented on the ranch's lands. The utilized flake data indicate an increased emphasis on right-edge cutting edges in the non-structural sites. This observation is consistent with either an Archaic or a Puebloan interpretation for these sites and may signify that some are hunting-camp components (Tainter 1979a).

Atrisco Sector Assemblages

The general lithic files for the Atrisco area sites included data for 8,455 items from 97 loci of 48 sites. Of these loci, only 37 were represented by 20 items or more. The total item count for the largest 37 loci was 8,004 items, with counts per locus at the larger loci ranging from 20 up to 1,876 items. Three loci contributed more than 1,500 items apiece. Of the total count of 8,455 items, 357 were coded as unmodified rocks. Perhaps another 50 cases were partially or severely miscoded (judging on the basis of internal consistency) and were hence not fully meaningful cases.

The Atrisco data included 19 sites that were represented only by survey collections and 29 that underwent more or less extensive testing (Bertram and Burgett, this volume). None of the Atrisco sites was fully excavated.

It is not possible now to determine whether all of the materials collected from the Atrisco sites were included in the general lithic data listings. Working from the best inventory data available (other than the lithic coding sheets, which were not available at that time) the author and Burgett (this volume) seem systematically to have underestimated the number of items actually recovered from the Atrisco sites relative to the GLP data counts, often by factors of ten or more. Judging from the information presented above for the Ball and Placitas data sets, any assumption regarding the degree of completeness of the Atrisco general data sets would therefore be unwise. It seems likely, however, that the overall completeness of these data are fairly high.

Schutt apparently analyzed most or all of the bifaces other than projectile points. It appears, though, that non-biface formal tools were sampled at a lower intensity for her study. Only one of the richer Atrisco sites, AT 15C, seems to have been strongly under-represented in the detailed formal listings: about half of the formal chipped stone tools from this site were listed in the general analysis as projectile points. The Atrisco formal tools may not, in any event, be viewed as a sample analyzable under the same assumptions as the general lithic data listings. It is known that the Atrisco field procedures selectively emphasized collection of diagnostics, but only in certain cases emphasized the co[...] tion of spatially-defined debitage scatters.

The same pattern does not hold for the Atrisco c[...] special analysis listings, also prepared by Schutt. T[...] listings have no data at all for any of the 15 to 20 c[...] tabulated in the general listings for sites AT 35C, [...] 37C, or 38C. AT 15C and 31C are underrepresent[...] items vs. 30 core items in the general listings) an[...] 29C may also be underrepresented. For most other [...] in the Atrisco group, the Schutt listings tabulat[...] many cores or more than do the general data files. [...] probably indicates that most or all of the cores f[...] these sites actually underwent intensive descrip[...] analysis. The Atrisco core data are probably no[...] general comparable to the other data from the gen[...] listings. As was also the case for formal tools, cores w[...] specifically singled out for collection in many of [...] Atrisco sites, including some of those where a trans[...] or gridded collection of debitage was also made.

It may be that no representative sample of [...] groundstone items from Atrisco was ever analyzed[...] detail. The USFS electronic data files contain no [...] tailed listings for any Atrisco groundstone items; [...] corresponding printed files list only three items from [...] AT 2C. The general files also list three items from AT [...] but they list 59 other items of groundstone from ot[...] sites as well. Only the general listings can be relied[...] for details of data on abundance and typology [...] groundstone for the Atrisco sites.

These data suggest that the Atrisco general lithic ana[...] sis listings may, within limits, be viewed as a reasonal[...] representative sample of the Atrisco site assemblages[...] least for debitage items. For certain sites only, the c[...] and formal tool general and special data may be comp[...] rable to the debitage data from the general listings.

The Atrisco General Lithic Data Files

The Atrisco sites are comprised of both structural Anas[...] and non-structural Archaic and Anasazi sites. They a[...] set either on the slopes of the bajada ridges runni[...] down from the mesas to the east and west to the R[...] Puerco floodplain, or else on the margins or flats of t[...] floodplain itself. For analysis, the Atrisco sites we[...] divided into four strata: slope-setting structural, slop[...] setting non-structural, valley-setting structural a[...] valley-setting non-structural sites. Data on the locatio[...] of sites were drawn from survey notes. Data on t[...] structural character of sites were drawn from Bertra[...] and Burgett's summaries for the tested sites and fro[...] field notes for all other sites. Classification problem[...] arose for sites at the foot of the bajada slope and for site[...]

where living floors or formal hearths were reported without other associated architecture. Fifteen of the Atrisco sites were selected for individual analysis on the basis of overall assemblage size.

In the valley-structural stratum, the individually-described sites included AT 15C, AT 25C, AT 31C and AT 37C. Most are Puebloan sites, or probably have dominantly Puebloan assemblages, but AT 37C is a probable Basketmaker III habitation. Other sites within this stratum had small assemblages (AT 1B, AT 7B, AT 2C, AT 3C, AT 14C and AT 32C) which were lumped for purposes of tabulation.

In the valley non-structural stratum, individually-analyzed sites included AT 1A, AT 3B, AT 27CD, AT 28C and AT 29C. Classification was most difficult for AT 1A, an extensive scatter with a possible living surface, and for AT 3B, which had an associated hearth. Both may properly belong in the valley-structural stratum. Pooled sites from this stratum included AT 2B, AT 4B, AT 5B, AT 6B, AT 1C, AT 11C, AT 24C and AT 34C.

In the slope-structural stratum, individually analyzed sites were AT 12B and AT 38C. Site AT 7C was the only other site in this stratum; its general listing records include only seven items.

In the slope-non-structural stratum there were four sites with data sets large enough for individual analysis: AT 8B, AT 21C, AT 35C and AT 36C. This last site may have had a living surface and hence might be classifiable as hill-structural. Pooled sites from this stratum included AT 2A, AT 3A, AT 9B, AT 10B, AT 11B, AT 4C, AT 5C, AT 8C, AT 9C, AT 12C, AT 13C, AT 16C, AT 17C, AT 18C, AT 19C, AT 20C, AT 22C and AT 33C.

Valley Floor Structural Sites

In the valley floor sites which had structures, chalcedonies of the Santa Fe / Pedernal group were by far the most abundant material type. The only other material which anywhere approached the abundance of this group was the silicified wood group of types 1112 and 1113 in AT 37C (Tables 11-90 to 11-94). In material type abundances, these sites differed substantially from the overall Atrisco pattern also in their obsidian abundance, which was proportionally much higher than in any other stratum. Other materials common in the Atrisco overall collection were about as well represented in this stratum as elsewhere. These included types 1010 to 1016 fossiliferous cherts, types 1214 to 1215 chalcedony with inclusions, and types 1130 to 1150 fossil woods. The materials abundance patterns for AT 25C, for AT 31C and for the pooled small-sample sites from this stratum were very similar. Site AT 15C differs from the others in having a much higher chalcedony proportion, a lower proportion of the common fossil woods and a higher proportion of the less common fossil woods.

The site assemblage from AT 37C consisted of 102 flakes, two pieces of angular debris, four bifaces, two cores, five hammerstones, a mano, two metate fragments, two other groundstone fragments, a tested cobble and 28 unmodified rocks (for which material type unfortunately was not recorded). On these items, cortical surfaces were common only on type 1054 chalcedony flakes. The slightly more common type 1112 fossil wood flakes had little or no cortex in 47 of 49 cases. The assemblages from the other structural valley sites included proportionally much greater amounts of cortical debitage from all of the more common material types and not merely from the Santa Fe/Pedernal chalcedony group.

The other sites' assemblages were in general similar to that of AT 37C in that the same artifact types were about as abundant in rank order terms. In proportional terms, angular debris was much more common in the sites other than AT 37C, as were exhausted cores. AT 37C had proportionally far more bifaces, hammerstones, other groundstone and metate fragments. Since the other sites were typically richer in diversity than AT 37C (except of course for the pooled sparse sites, which were in aggregate richer as well), typically much-less-common artifact types were also observed in these sites: five projectile points, a uniface, a burin, a scraper, a bipolar flake and an anvil stone (Tables 11-95 to 11-99).

As with all the Atrisco strata, flakes were the most abundant debitage group in the valley structural sites. Manos and other groundstone items were not especially abundant. Bifaces outnumbered cores and angular debris in AT 37C, but elsewhere were rare; cores and angular debris were common in the remaining sites. Cores were proportionally most common in AT 31C. Half of the bifaces and the only core on AT 37C were of fossil wood 1112. Examining the commonest material types used for cores and bifaces, no bifaces of fossil wood 1112-1113 and 13 bifaces of Santa Fe/Pedernal were found on the sites other than AT 37C. Only four silicified wood cores and 28 Santa Fe-Pedernal cores were found on the other sites (Tables 11-100 to 11-104).

Faceted platforms were the most common diagnostic platform type on all of the valley structural sites. The second most common type was retouch platforms on AT 37C, where this type was twice as abundant as cortical platforms and one-eighth as common as faceted platforms. On the other sites, cortical platforms were two to four times as abundant as retouch platforms. On all the sites, cortical platforms were a fourth to a fifth as common as faceted platforms. On AT 37C, faceted platforms most commonly had platform angles of about 60 to 65 degrees, 76 degrees and 85 degrees. Retouch platforms typically had platform angles of 70 to 75 degrees. On the other sites, faceted platforms exhibited a more or less continuous angle distribution between angles of 65 and 90 degrees, with peaks around 68 and 80 degrees. Cortical platforms on the other sites exhibited a similar but slightly less acute range. Retouch platforms on sites other than AT 37C were too few to permit characterization of angle trends (Tables 11-105 to 11-109).

Of the 40 or more cores, spent cores, utilized cores and tested cobbles reported from the valley structural sites in the general lithic listings, only three items are present in the special core analysis listings. There was one item each from AT 15C, AT 31C and AT 32C. These are discussed with the other special analysis cores in a separate section, below.

Formal tools from the valley structural stratum sites actually listed in the detailed formal analysis records included ten bifaces and a retouched item from four sites. The general lithic files indicate that approximately 20 formal tools and four retouched items (including nine bifaces and five points, as well as several uniface/scraper/chopper listings) were recognized in the initial study of these sites. Special analysis formal tools are discussed separately below.

A total of ten edges on eight debitage items from the valley structural sites were reported to have been utilized or retouched. Of these, three came from AT 15C, one was from AT 31C, two were from AT 2C and two came from AT 3C.

The AT 2C items included a type 1214 chalcedony with right convex edge use (unimarginal polish) on a 56 degree edge. The second item, made on type 1112 fossil wood, was coded as a utilized flake with right straight edge use (wear not coded) on a 70 degree edge co-occurring with left edge convex retouch on a 78 degree edge (no wear character coded). The retouch code is in conflict with the overall simple flake artifact code.

The items from AT 3C included a type 1040 flake and a type 1142 piece of small angular debris. Both bore codes indicating retouch (in conflict with the artifact type main code), but had no other data coded on retouch or wear placement or character.

The three items from AT 15C were all recorded as utilized flakes. The first was listed as a type 1214 flake having both left and right edge projections. The left edge angle was 60 degrees and use wear was unidirectional scarring; the right edge angle was 80 degrees and use w was bidirectional scarring and polish. The second i from AT 15C was on type 1014. It had 30 degree stra left edge bidirectional scarring and polish. The t item from AT 15C was on type 1054. It had straigh degree unimarginal edge scarring.

The item from AT 31C was logged as small angu debris (type 2) but coded as retouched on an edge to a degree angle (it should have been logged as type 3 retouched small angular debris). No edge shape or w were recorded for this item.

The incidence of apparent errors or deviations from specified protocol for recording of retouch and use w in these cases is high for three of the four sites c cussed. The same is true of use/retouch coding fr five other Atrisco sites in other analytical strata. Un corded wear on retouched edges may actually sig that no wear was seen, but no similar interpretatio zero codes for edge angle can be offered. All edge ang for used or retouched items should have been record The author would consider all utilization/retouch d from sites AT 2C, AT 3C and AT 31C, and perhaps fr the entire Atrisco sector, as not fully reliable for t reason.

In summary, the valley structural sites from Atris seem to represent two different tool and debitage pa terns. The first is present in AT 37C. The second m characterize all the remaining sites in this stratum. T AT 37C pattern emphasized biface reduction at t expense of core reduction, employed fossil wood mo often and involved the detachment of flakes from r touch platforms more often than from cortical platform These are all characteristics which were opposite those recorded from the other valley structural sites

There is little evidence that the association pattern bifaces, retouch platforms and faceted platforms flakes, and silicified wood debitage (implied for AT 37 entailed work on significantly more acute platform angl than did the contrastive association pattern of chalced nies, faceted and cortical platforms and cores, impli for the other structural valley sites. If the retouch fla platforms are properly an aspect of the biface-relat components of the AT 37C assemblage, one would ha expected a generally more acute range of platform angl on flakes with retouch platforms. Biface reduction generally carried out on significantly more acute pla form edges than is any other locally common form reduction. On AT 37C, only one of eight retouc platforms (an unfortunately small sample) had an ang of less than 60 degrees. The most acute of the angle da clusters for faceted platforms on this site lies in th range of 58 to 65 degrees.

Although the AT 37C pattern may be a valid one for Basketmaker III lithic assemblages in this area, one should not infer that the reduction product assemblage on AT 37C included a substantial biface reduction component. It might be a valid inference if the bifaces which actually were being worked on that site had relatively obtuse edges. Data on biface edge angles are not available to permit checking of this hypothesis. The author would speculate that bifacial core reduction (early stage biface reduction) should be inferred as a dominant mode of flake production for direct use at AT 37C.

Valley Floor Non-structural Sites

The Atrisco sites from valley context which had uncertain or no evidence for structural associations included five sites with assemblages sufficiently large to allow individual study (AT 1A, AT 3B, AT 27C, AT 28C and AT 29C). There were also eight additional sites of which each had few entries in the general lithic description listings (AT 2B, At 4B, AT 5B, AT 6B, AT 1C, AT 11C, AT 24C and AT 34C). These latter were pooled for discussion.

The richest data set came from AT 1A, which underwent extensive collection, including collection of grid-provenienced surface items. The grid collection effort on AT 1A was never completed; it is not known whether unrepresented grids were empty, omitted, or not collected. As a consequence, no spatial analysis is possible for these collections, which will be discussed as a single group.

Material type abundances in the valley non-structural sites indicate a rather clear subdivision of these sites into those dominated by type 1112-1113 fossil wood (AT 1A, AT 3B and AT 27C) as opposed to those dominated by Santa Fe/Pedernal cherts (AT 28C, AT 29C and the pooled small-sample sites). In all of these sites, one or the other of those material groups was dominant and the other of second abundance. Other materials present in lower frequencies on all sites included the type 1010 - 1016 fossiliferous cherts, the 1214 - 1215 chalcedonies with inclusions, and the type 1130 - 1150 fossil woods. Only 11 obsidian items were collected from these sites, eight of which came from AT 1A (Tables 11-110 to 11-115).

As was the case at the structural valley site AT 37C described above, the valley non-structural sites dominated by silicified wood tended to have lower relative frequencies of angular debris, lower frequencies of cores and much higher frequencies of bifaces than did the sites dominated by chalcedonies. This pattern is most evident at AT 1A, for which 61 bifaces and only 12 cores are reported in the general files. There is evidence in field notes that the general grid collection at AT 1A was heavily augmented by intensive collection of bifaces, accounting in part for the extremely high biface numbers. However, judging from the pattern of material type abundance from other sites and the abundance of fossil woods at AT 1A, it appears that biface counts would have been quite high even if additional collection of bifaces had not been done at AT 1A (Tables 11-116 to 11-121).

The abundance patterns for common groundstone types (i.e., manos and unidentifiable groundstone) did not follow the trend for chipped stone. Groundstone was relatively abundant (about 3% of the assemblages) at AT 3B and at AT 29C and intermediate in the pooled sparse sites (about 2% if one includes metate fragments), but much more rare (less than 1% or absent) at the other sites, including AT 1A. Other artifact types present in much lower abundance on these sites included projectile points (one on AT 1A and one on AT 2B), unifaces (three on AT 1A and one on AT 27C), handheld hoes (two on AT 6B) and hammerstones (one each on AT 1A, AT 2B and AT 1C and two each on AT 28C and AT 29C). THere were also metate fragments (two on AT 1A; one each on AT 6B, AT 1C and AT 34C).

As in the valley structural sites, bifaces tended to be made more often on fossil wood. Cores and angular debris were more often of Santa Fe/Pedernal chalcedony. Sites with substantial angular debris on fossil wood tended to have few or no bifaces. Bifaces were more commonly made on rare materials than were other artifact types in the valley non-structural sites. AT 1A bifaces of uncommon materials included one of type 1220 chalcedony with inclusions, two of type 1230 chalcedony with inclusions, one of type 1233 chalcedony with inclusions, one of type 1434 jasperoid chert and one of type 3523 obsidian. From AT 28C came a biface made on type 1660 chert. From the pooled sites came bifaces (one per material type) made of type 1042 chert, type 1430 jasperoid chert, type 1630 chert and type 2200 generic orthoquartzite. Compared to silicified wood (the commonest biface material group), none of these materials was present as other debitage in the sites in question in abundances as proportionally high as those implied by the presence of the bifaces.

Cortical abundance in these sites was relatively invariant (Tables 11-122 to 11-127). For the major Santa Fe/Pedernal and type 1112 - 1113 wood variants in AT 1A, AT 3B and AT 27C, 5% to 10% of all items had greater than 50% cortical coverage. The chalcedonies typically were somewhat more commonly cortical than the woods. Other materials probably did not differ significantly from this range of cortical abundance. The only items commonly judged as having high cortex frequencies were metaquartzites, conglomerates, vitrophyres and non-orthoquartzitic sandstones, none of which are useful knapping stone materials. [The reader will recall that cortex percentage was also coded for non-flaked lithic items such as manos and hammerstones in the GLP.] In the other sites, incidence of high cortical percentages for most materials, including the woods and the chalcedonies, ran rather higher (typically about 20%). Again, the non-knapping materials had high incidences of high cortex coverage on items.

Platforms on items from all sites other than AT 1A were most commonly faceted. On AT 1A, retouch platforms were most common, but faceted platforms were almost as abundant. Ground platforms were reported only from AT 1A, where they made up about 0.7% of the analyzable platform assemblage. Flake counts from AT 1A and AT 27C were high enough to allow examination of platform angle trends. In AT 1A, cortical platform angles ranged from 55 to 98 degrees, with a main peak of 84 degrees and subsidiary peaks of 70, 77 and 91 degrees. AT 1A faceted platforms ranged in angle from 35 to 104 degrees, with minor peaks at close intervals from 55 to 88 degrees and a major peak at about 79 degrees. Retouch platforms ranged from 45 to 92 degrees with minor peaks from 50 to 83 degrees and a major peak at about 80 degrees.

AT 27C trends were similar with the cortical main peak near 85 degrees, the faceted main peak near 83 degrees and the retouch main peak in the 72 to 77 degree range (Tables 11-128 to 11-133). On AT 27C, retouch platforms were about half as abundant as faceted platforms; on the remaining sites, cortical platforms were the second most abundant platform type.

Data from the other sites were pooled to improve resolution in angle distribution examination. In the other sites, cortical angles ranged rather uniformly from 57 to 123 degrees with no evident strong peaks. Faceted platforms in the other sites displayed fairly strong abundance peaks at 66, 75, 83 and 91 degrees. Retouch platform data were sparse for sites other than AT 1A and AT 27C, but the pooled data from the other sites indicated peaks of abundance at angles around 61, 68, 74 and 86 degrees.

There appears to be little evidence that platform angles for the three main analyzable platform types differed between sites, although cortical platforms are more variable in angle than are angles for the other two platform types. As was seen in the valley structural sites, there is little indication that sites with an apparently higher incidence of biface reduction had much more acute platform angles on analyzable flakes than did sites apparently dominated by core reduction. In all sites, most flakes had high platform angles, with little difference in platform angle distributions between co cal, faceted and retouch platforms.

Of the 24 cores, tested cobbles, core choppers, co hammerstones and core tools reported from individually analyzed valley non-structural sites in general lithic listings, only three pieces are described the core special descriptive analysis listings. A total 22 cores and core-combination items are described the general listings for the pooled valley non-structu sites with small collections. The Schutt core descripti files list a total of 24 items from these sites. Those items are discussed in a later section of this report.

Of the 81 chipped formal tools tabulated for the vall non-structural sites in the general lithic listings (' bifaces, three points, four unifaces and two hand hoe most also appear to be covered in the special formal to listings. The special formal tool listings include 77 iter (69 bifaces, three unifaces, three points, a graver and drill). The special listings formal tools will be describ in detail in a later section.

Ten retouched or utilized items, of which nine we flakes, were coded in the general lithic listings for AT 1. The flakes included six items utilized on the rig margin, one utilized on the distal end and two utilized o the left margin. Also listed was an item coded as retouched rock. This piece of Santa Fe chalcedony bo straight bidirectional retouch which produced an edg that measured 50 degrees, but for which no wear wa recorded.

The flakes used on the right margin were made o fossiliferous chalcedonic chert (type 1014 with tw items), jasperoid chert (type 1072 with one item), foss wood (type 1112 with one item), obsidian (type 3523 wit one item) and Santa Fe/Pedernal chalcedony (one item The chert and wood items all had sharp edges and bor bidirectional scarring: one item had a 28 degree concav edge, one a 38 degree straight edge, one a straight 4 degree edge and one had a 43 degree straight edge. Th Santa Fe item had an intermediate (57 degree) concav edge with bidirectional scarring. The obsidian piece ha a steep (82 degree) concave edge with unidirectiona scarring and polish.

The items modified on the left margin were made o fossiliferous chert 1016 (convex unidirectional scarrin on a 78 degree edge) and fossil wood 1112 (straight edge 43 degree angle, bidirectional scarring). The distall modified item was a fossil wood flake used as a endscraper; it had a convex edge which bore unidirectional scarring at an 86 degree angle.

Site AT 1C is listed as having one retouched flake of Pedernal chalcedony. This item was coded as a flake.

rather than a retouched flake, but it was also coded as having been retouched. No edge shape, angle, or wear were recorded for this last piece.

Site AT 5B had a right margin retouched flake with a straight 73 degree edge and no wear noted. This Santa Fe/Pedernal piece was coded as a simple flake but also coded as retouched, as was the case for the last item described above.

Site AT 6B had a "retouched rock" of Santa Fe/Pedernal which was coded as bearing a convex unimarginally retouched 67 degree edge. No wear was noted for this piece.

Site AT 27C had a left margin retouched fossiliferous chert item coded as a uniface. It bore unimarginal retouch on a convex 70 degree edge with no report of wear.

Site AT 34C had two modified items, both coded as common flakes but flagged as unimarginally retouched on convex edges. Neither had wear data coded. The first was a Pedernal chalcedony flake with a 66 degree right edge, and the second was a fossil wood type 1112 flake with 62 degree distal retouch.

The assemblage characteristics for sites AT 1A, AT 3B and AT 27C seem to resemble those described above for the Basketmaker III structural site AT 37C. All emphasized biface reduction at the expense of core reduction and all have rather high frequencies of fossil wood compared to Santa Fe/Pedernal. All three sites have high frequencies of retouch platforms, have rather little cortical debitage and all have relatively little angular debris. The remaining valley non-structural sites seem overall to resemble the valley structural sites other than AT 37C more closely in their higher incidence of Santa Fe/Pedernal, cores, angular debris, cortical reduction and cortical platforms.

As was also the case with the valley structural sites, the platform data for the Atrisco valley non-structural sites seem to indicate that the biface reduction pattern entailed work mostly on high edge angles, regardless of platform character. The result again seemed to be that little difference in noncortical platform preparation was apparent to discriminate biface from core reduction. The author would again speculate that this reduction pattern reflects the production for use of simple flake edges from bifacial cores or early stage bifaces.

Hill Slope Structural Sites

The valley floor sites whose lithic assemblages were described above are flanked to the east and west by the slopes of the Rio Puerco valley margins. These slopes are composed of interspersed bajadas, badland escarpments and secondary alluvial fans developed on the eroded underlying Santa Fe formation alluviums and occasional volcanic deposits (near Mesita Negra and Cerro Colorado) which make up the uplands. Many of the ridges along these slopes are covered by an aeolian mantle which ranges in depth from a few centimeters to many meters. Structural sites were found on these slopes interspersed with lithic reduction sites and quarry areas located on or near units of the Santa Fe gravels rich in chalcedony cobbles and fossil wood cobbles.

Only two hill slope structural sites had large collections, AT 12B and AT 38C. The only other hill slope structural site represented in the general lithic collections was AT 7C, which included only seven flakes.

The collections from the hill structural sites included exclusively flakes, angular debris, hammerstones, cores and groundstone (Tables 11-134, 11-135 and 11-136). The dominant material type at AT 38C was Santa Fe/Pedernal chalcedony (92 items; 7% with much cortex). This was true also at AT 12B (58 items; 22% with much cortex). AT 38C had more items (21) of fossil wood types 1112 and 1113 (14% with high cortex) than did AT 12B (five items of which one had high cortex). Other material present in more than trace amounts as chipped stone were type 1152 fossil wood (three items in At 38C), type 1214 chalcedony with inclusions (five items in AT 38C), type 1434 chalcedonic jasperoid chert (three items in AT 12B) and type 1600 generic gray chert (three in AT 12B).

Artifacts from these sites included, for AT 12B and AT 38C respectively, flakes (68, 106), angular debris (1, 15), cores (1, 4), a tested cobble (0, 1), hammers (2, 0), manos (1, 0), other groundstone (1, 2) and metate fragments (2, 0). All five cores were Santa Fe chalcedony; the tested cobble was type 1112 wood. The only mano was of vitrophyre (sic). An undiagnosed groundstone piece was of type 1112 wood; all other groundstone was of type 2000 generic sandstone. A total of 39 unworked rocks were also collected from these two sites. Unfortunately, only four of these were identified to material type (Santa Fe chalcedony). The debitage from AT 7C included five chalcedony flakes, a wood flake (type 1142) and an orthoquartzite flake (Tables 11-137 to 11-142).

The sparse data on platform types and angles from these sites indicate very similar reduction on the three sites. Of seven cortical platforms on AT 38C, five had angles in the range of 87 to 97 degrees. Faceted platforms on this site ranged in angle between 50 and 97 degrees, with the strongest clusters of angles at 68 and 82 degrees. The only retouch platform had an angle of 64 degrees. The platforms from AT 12B included 3 cortical platforms of about 62 degrees, 2 cortical platforms at 84 and 89 degrees, and 19 faceted platforms ranging in angle from 51 to 86 degrees, with peaks at 68 and around 80 degrees. The platforms from AT 7C included a cortical platform with a 67 degree strike angle and faceted platforms of 60, 62, 68, 81 and 82 degrees (Tables 11-143, 11-144 and 11-145).

Of the five cores and one tested cobble reported from this stratum, one single platform core from AT 12B was included in the detailed core analysis sample listings prepared by Schutt.

No formal chipped stone tools were collected from the three sites within this stratum.

One item from AT 38C was logged as a flake but flagged as a unimarginally retouched item. Edge shape, edge angle, and edge wear were not recorded.

Based on the data from the general lithic listings, there are no clear differences between the assemblages in hill slope structural sites and those chalcedony-dominated assemblages described above for valley structural and non-structural sites. The hill slope structural assemblages exhibit little within-stratum variation; all differences observed between AT 12B and AT 38C may be due to sampling effects. The sample from AT 7C is obviously too small for comparison.

Hill Slope Non-Structural Sites

Of the hill-slope sites for which little or no evidence of structures was found, a total of four sites had assemblages large enough for individual comparison: AT 8B, AT 21C, AT 35C and AT 36C. Sites with smaller assemblages were pooled for analysis; these included AT 2A, AT 3A, AT 9B, AT 10B, AT 11B, AT 4C, AT 6C, AT 8C, AT 9C, AT 12C, AT 13C, AT 16C, AT 17C, AT 18C, AT 19C, AT 20C, AT 22C and AT 32C.

On the basis of material type relative abundances, the hill slope non-structural sites appear to be differentiated into chalcedony/core sites and fossil wood/biface sites, just as were the valley sites described above (Tables 11-146 to 11-150). Sites AT 8B, AT 21C and the pooled small-sample sites were dominated heavily or almost completely by Santa Fe/Pedernal chalcedony. Site AT 35C had almost twice as much fossil wood types 1112-1113 as chalcedony and also a high proportion of wood types 1130-1142. Site AT 36C had an unusual mixture of these two patterns, with almost equal counts for chalcedonies (71, Santa Fe/Pedernal) and woods (85, types 1112-1113).

The larger sites had essentially equal proportions of high (more than 50% coverage) cortex for Santa Fe/Pedernal and for wood types 1112-1113. AT 36C had ap[illegible] mately equal proportions of cortex levels greate[illegible] half for Santa Fe/Pedernal (21%) and for the co[illegible] woods (22%). Site AT 35C had high cortex levels [illegible] of its common chalcedonies and also on its co[illegible] woods. AT 8B had a tiny sample of woods (two item[illegible] a 17% proportion of high cortex items for chalced[illegible] AT 21B had a 33% cortical fraction for chalcedoni[illegible] an 11% fraction (on only nine items) for woods[illegible] pooled small-sample sites had a 20% high-corte[illegible] tion for chalcedonies and a 15% fraction for woods. [illegible] likely effects of sample size and collection procedu[illegible] the smaller samples are considered, there are n[illegible] vincing grounds for concluding that any of these[illegible] differ from any of the others in cortex abundan[illegible] common materials (Tables 11-151 to 11-155).

Artifact type relative abundances in the hill slope[illegible] structural sites were not strongly different from [illegible] seen in other strata. As always, debitage was [illegible] common than cores or tools; in these sites, an[illegible] debris always outnumbered any single tool type. [illegible] sites with dominant chalcedony debitage, cores [illegible] more abundant than bifaces; in AT 35C, with its [illegible] abundant silicified wood, the reverse was true. Si[illegible] 36C presented an intermediate case; it had seven bi[illegible] and five cores (Tables 11-156 to 11-160).

Groundstone was absent from AT 8B. Sites AT 21[illegible] AT 36C each had only one groundstone item. A m[illegible] fragment and a flake from a groundstone object [illegible] listed from AT 35C. The pooled small-sample site[illegible] nine groundstone items (seven manos and two un[illegible] tifiable groundstone pieces). This abundan[illegible] groundstone may reflect either the presence on [illegible] sites of groundstone furniture, or that pooling [illegible] sites in the manner selected was unwarranted.

Rarer artifacts from the hill slope non-structural [illegible] included a tested core from AT 21C, a preform fro[illegible] 36C and a burin from AT 8B. The pooled sites yi[illegible] two projectile points, a uniface, a burin, two te[illegible] cobble cores, two exhausted cores, a core/hammers[illegible] and four hammerstones. There was also an art[illegible] coded as "other," about which no other data are a[illegible] able.

Site AT 35C had more retouch platforms than all o[illegible] diagnosable platform types together. Very few cor[illegible] platforms were found on this site. Faceted platfo[illegible] were about half as abundant as retouch platforms. [illegible] ground platforms, with angles of 78 and 84 degr[illegible] were listed. Cortical platform angles clustered aro[illegible] 85 degrees. Faceted platforms had apparent peak[illegible] abundance at 70, 78, 82 and 85 degrees. Retc[illegible] platforms had apparent peaks at 67, 72, 77, 82 an[illegible] degrees (Table 11-161).

ite AT 36C was more different from AT 35C in platform haracter than the similarity in material abundance ould have suggested. Cortical platforms were as bundant as retouch platforms (each about a third of the ollection). Ground platforms were 17% of the analyzable ollection and faceted platforms were slightly less abun-ant than ground platforms. Unfortunately, the platform ngles from this intriguing and apparently unique site eem not to have been measured (Table 11-162).

ite AT 21C is a relatively typical site in its lithic platform haracteristics. It had mostly faceted platforms (15), ith peak abundances near 80 and 85 degrees. Fewer ortical (4) and retouch (5) platforms were present. ortical platforms tended toward higher angles (range of 2 to 110 degrees) than did faceted platforms (75 to 86 egrees [see Table 11-163]).

he small-sample pooled sites had a distribution similar) that at AT 21C. Faceted platforms were about four mes as common as cortical or retouch platforms. ortical platforms ranged in angle from 65 to 110 egrees, with possible peaks at 74, 78 and 85 degrees. etouch platform angles ranged from 60 to 120 degrees ne entry of five degrees is probably an error), with eaks at 70 and 76 degrees. Faceted platform angles anged from 40 to 110 degrees (the codes of 801 and 871 egrees are clearly errors), with a major peak at 80 egrees and minor peaks near 60, 69, 75, 80, 83 and 97 egrees (Table 11-164).

ite AT 8B had only one retouch platform, 13 faceted latforms, and six cortical platforms. Platform angles or cortical platforms ranged from 59 to 77 degrees. latform angles for faceted platforms ranged from 64 to 7 degrees, with a possible peak near 82 degrees (Table 1-165).

f the 44 cores, three tested cobbles, two exhausted ores and single core/hammerstone listed in the general nalysis codes for the hill slope non-structural sites, nly 15 cores were coded in the special core analysis ata files. Of these, none were from AT 21C, AT 35C, or T 36C. The fourth individually-studied site, AT 8B, had wo of five cores represented. The small-sample pooled ite core collection, by contrast, was represented by 13 ores from nine sites out of a possible 27 cores from 18 ites. Site AT 10B had three items listed in the special les but only one item in the general files. This suggests hat an unrecorded re-examination of the Atrisco collec-ions occurred. The 15 cores coded in the special nalysis are discussed in more detail in the next section f this report.

f the 53 bifaces and ten or so other formal tools from he non-structural hill slope sites, it seems that almost ll were selected for detailed formal descriptive analysis by Schutt. Her files contain records for 51 bifaces, four projectile points and a preform, three unifaces, a wedge and a denticulate from these sites. Formal tools coded in detail by Schutt are discussed in a later section of this report.

A total of eight items from five of the hill slope non-structural sites were coded as bearing retouch or wear. These included a biface, a uniface, a mano and five flakes. The mano, a generic metaquartzite tool found on AT 6C, was flagged as being of use code 4 (an undocu-mented code) and as bearing pecking and abrasion. No other data were entered for this piece. The uniface, a Pedernal chalcedony piece from AT 10B, was recorded as bearing no retouch, but as having unidirectional round-ing on the 70 degree convex (left?) edge. The AT 35C biface, of type 1112 wood, is also coded as utilized rather than as retouched; it is listed as having a straight edge with an edge angle of 54 degrees, and as bearing bidirectional rounding.

The flakes were described as follows. A type 1434 chert flake from AT 10B was coded as a common flake, but flagged as bearing retouch on a 90 degree left convex edge, with no wear noted. A Santa Fe chalcedony flake from AT 12C was also coded as a simple flake, logged as a retouched flake, and described as bearing 65 degree retouch with no wear on its left convex edge. In com-ments, this item appears to be described further as a notching flake, although its dimensions are given as 43 by 38 by 20 millimeters in the listing. An apparently identical item, with the same confusing codes, was recorded from AT 36C; it differs from the last example only in the edge angle (77 degrees) and dimensions (57 by 28 by 18 millimeters). This author is not able to interpret these large items as notching flakes; perhaps the codes were intended to describe notched flakes.

Two other flakes from AT 36C were also coded as simple flakes, flagged as retouched and reported to have no visible wear. One, of type 1112 wood, was shown as having unimarginal left retouch (with a 66 degree edge). The second, of type 1214 chalcedony with inclusions, is shown as having unimarginal 87 degree convex retouch on the right edge. This last item is also flagged in a special field as being angular debris.

The utilization and retouch codes for the non-structural hill slope sites seem to be damaged data. The records just described do not follow the conventions originally laid down in the general lithic analysis data coding protocol. Many of the recoded observations appear to be counter-intuitive.

The sites of the Atrisco hillslope non-structural stratum appear to represent examples of the same dichotomy of pattern described previously for the other Atrisco analytical strata. AT 35C and, to a lesser degree, AT 36C are dominated by bifaces, silicified wood and a combination of faceted and retouch platforms. They may have more angular debris than do similar sites in other strata. AT 36C has an anomalous abundance of ground platforms which seem to replace retouch platforms on this site. The lack of any platform angle data makes difficult any further assessment of this speculation. The remaining sites have the contrasting pattern of dominance by Santa Fe/Pedernal chalcedony, cores and a combination of cortical and faceted platforms, a pattern also recognized consistently in other strata.

On the whole, the sites in this stratum seem to have an incidence of items with high cortex coverage which is as high or higher than is typical of either wood-dominated or chalcedony-dominated sites in other analytical strata. Groundstone items were generally rare when considered on a site-by-site basis. Perhaps this reflects an emphasis on lithic materials extraction and/or hunting-related work, rather than on plant food-getting activities, in these sites.

Metric Data Patterns in the Atrisco Flake Collections

The reader will note that flake dimensional statistics, presented with individual assemblage or stratum descriptions for Ball and Placitas, were omitted in the site and stratum descriptions in Atrisco. These were originally computed in the same manner as the other areas, but the discovery of patterning related to material type and reduction trajectory suggested an alternative approach. That approach was to examine the trends in common materials in chalcedony-dominated vs. wood-dominated assemblages regardless of stratum. This comparison will now be explored.

For this analysis, the assemblages of flakes of Santa Fe/Pedernal chalcedony and of the common conchoidally-fracturing fossil wood type 1112-13 which were fully recorded were divided into two groups. One group contains flakes from sites dominated by chalcedonies; the other has flakes from sites in which conchoidal woods were of the same or greater order of abundance as chalcedonies. Simple statistics were calculated for the weight, length, width and thickness of all flakes chosen as above, and again for only those flakes coded as complete. All other materials were excluded from these comparisons as having number/diversity ratios too low for robust analysis, and also because the patterns described in the previous discussions seem to be clearly definable only in terms of the common woods and of Santa Fe/Pedernal chalcedonies.

In an earlier section, the author expressed reserva on the ability of even the most competent ana reliably to distinguish complete flakes from flake ments. In the Atrisco data, these concerns were b out.

In the Atrisco data set, the mean length of all fl regardless of completeness as coded, was never than 90% (chalcedonies, both strata) of the mean le of complete flakes, and hence not significantly diffe In the case of fossil wood in sites dominated by f wood, the ratio of mean lengths for all flakes comp to whole flakes was 0.98, a patently nonsignifi value. The ratio for fossil wood in sites dominate chalcedony was 0.94, indicating no significant d ence.

Comparisons of weight means have the effect that n differences in linear dimensions are exaggerated t order of the cube of the difference. In these com sons, a similar trend was found. All wood flake wood-dominated sites averaged 90% as heavy as whole flakes alone. All wood flakes in chalced dominated sites averaged 85% as heavy as did w flakes in the same setting. Chalcedony flakes ov averaged 66% and 76% as heavy as whole flakes a in wood-dominated and chalcedony-dominated s respectively. To determine the linear estimate equ lents of these weight trends, one need only comput weight-ratio cube roots; they are 0.97, 0.95, 0.87 0.91, listed in the same order as the weight ratios. approach might best be thought of as modeling weight ratios as cubed linear ratios; i.e., estima weight as proportional to the product of length X w X thickness.

Similar ratios may be calculated for width and th ness; these are not shown. The pattern is the sa regardless of the measure. Complete flakes are average, only a little larger than are comparably-sam flakes judged to have been broken.

To place these figures in perspective, only 30 to 35 the flakes from wood-dominated sites were judged t complete by the analysts who coded the Atrisco ger data set. Only 40% of the chalcedony and 53% of wood flakes from chalcedony-dominated sites had s larly been judged to be complete.

In the author's opinion, these patterns can be rea ably interpreted only as indicating that a great n complete flakes were judged to be fragmentary, and v versa. Of course, the partial flake category prob contains more partial flakes than does the comp flake category, and the reverse. The important poi that either (a) the broken Atrisco flakes represe omplete flake population of substantially greater typi-al dimensions than the flakes reported as complete, or lse (b) distinguishing complete from partial flakes is too ifficult to permit it to be done reliably. The first ypothesis is marginally plausible; the second hypoth-sis is far more likely to be correct, given what is known f reduction behavior.

n the interest of comparability, the author has provided tatistics both for complete flake samples and for all akes in the associated tables (Tables 11-166 and 11-67).

xamining trends in flake size between materials and cross site groups divided by dominant material type, ne notes that fossil wood flakes are on average larger han chalcedony flakes in sites dominated by chalcedo-ies. In sites dominated by woods, however, chalcedony akes are consistently larger than are wood flakes.)verall, chalcedony-dominated sites have flakes of both aterial groups; these average 40% larger than flakes n wood-dominated sites. If the dominant material type f the site is ignored and all flakes analyzed by material roup only, then there are no significant differences etween overall mean sizes for wood and for chalcedony akes.

his pattern would appear to demonstrate that two ubstantially different technologies operated in the trisco study area. Neither of these two technologies vas focused specifically at quarry, farming, or habita-ion site use. Both technologies appear generally in all ettings and also with and without associated struc-ures.

he first technology was directed toward the production f rather small flakes, many from bifacial cores. It electively used fossil woods as the preferred material ype. When chalcedony was reduced, it tended to roduce somewhat larger flakes than did fossil wood. Chalcedony may have been reduced somewhat more ften using a non-bifacial (i.e., ordinary) core reduction ystem than was fossil wood. Care was typically taken o continue the reduction of cores, both bifacial and rdinary, beyond the stage of decortication.

Platforms were set up on non-cortical surfaces, many of vhich were judged by the analysts to be retouch plat-orms. This probably means only that platforms were of he multiple-facet, unabraded/unworn type. It is un-ikely that genuine formal tool retouch flakes would ever e as abundant as they are in these sites. Although the echnology was strongly bifacial, few flakes of any sort ad the characteristically low platform angles of typical iface trimming or thinning flakes. This indicates that nost bifaces were treated primarily, or at least initially, as a sort of discoidal core workable over both major faces.

The second technology contrasted strongly with the first. It was directed toward the production of rather larger flakes, mostly from cobble cores retaining significant cortex. It selectively used Santa Fe/Pedernal as the preferred material. When wood was reduced, it tended to produce flakes which were significantly larger than the flakes derived from chalcedony cores. Fossil wood was commonly reduced using a core technology not very different from that applied to chalcedony. Less care was taken to prolong the usefulness of cores, perhaps partly because the overall larger flakes which were desired were less easily produced from the typically smaller decorticated cores possible with the locally available cobbles. Platforms were most commonly faceted, but cortical platforms much outnumbered retouch platforms. The technology was characteristically core-oriented, but the platforms set up on cores were not much more obtuse (abrupt) than the platforms typical of the first technological pattern.

These alternate patterns may have temporal significance, with the bifacial pattern being earlier. However, if this is true, it does not account for the apparent reluctance of the people who practiced the biface technology to exploit the locally abundant chalcedonies to produce large tools. The driving factor for the differences in technology described here is not known, but it may well relate to a need for smaller flakes by the biface technicians and for larger and heavier flakes by the core technology folk. There can be little doubt that both technologies were generally known in all time periods. The mobility argument sometimes advanced to account for biface reduction as the technological norm cannot fully account for the patterns detailed here. Biface reduction was practiced at AT 37C by people who lived in structures of some permanence and who clearly had few mobility constraints while actually in residence at the site.

The technological differences detailed above may relate to a temporal, seasonal, or other shift or variation in overall subsistence. If we assume that a wide range in degree of agricultural dependence is represented in these collections, then we may account for some of the differences by noting that foragers encounter a greater and less predictable diversity of cutting tasks than do farmers. In the foraging case, flakes having sharp edges are more desirable; the flakes can be blunted if a more abrupt edge is required. In the farming case, the need is for easily made, durable tools large enough to permit the repetitive application of force to bulk-processed materials (corn, cornstalks, squash rinds, beans harvested as whole plants for drying, etc.).

Holding source cobble size constant, one can produce larger, somewhat less-sharp flakes by driving flakes from a cobble core with a hammerstone. The flakes produced are large, they drive deeply into the core and they consequently have typical edge angles in the 35 to 60 degree range. From the same cobble, trimmed to use as a biface-discoidal core, one may produce many more, smaller flakes with much sharper (10 to 45 degree) edge angles. These flakes are well suited as cutting tools where initial sharpness and cutting precision is desired, but they are not durable. Nor are they easily held where much force is repetitively applied to refractory materials for long periods in a session.

Foragers should prefer biface technology, using the product flakes for small precision jobs and the bifaces themselves for jobs requiring repetitive force. Farmers should prefer core technology, using more heavy flakes for both light and heavy cutting and with fewer precision flakes overall. The busier, less mobile farmer must also have fully appreciated the less demanding material quality and size constraints imposed by simple cobble core technology, compared with the greater material selection demands of full biface technology.

The Atrisco Area Special Core Analysis

As was noted above, the special analysis files prepared by Schutt did not include all the cores collected from the Atrisco sector. A total of 44 cores from sites and six cores collected as isolates were analyzed. Of these, almost a fifth (nine cases) came from AT 4B, a small-sample valley non-structural site. Other valley non-structural sites and their sample complements were: AT 1A (two cores), AT 2B (two cores), AT 5B (one core), AT 6B (three cores), AT 1C (three cores), AT 24C (one core), AT 29C (one core) and AT 34C (three cores). Valley structural sites included in the sample were: AT 15C (one core), AT 31C (one core) and AT 32C (one core). Hill structural sites were represented only by a single core from AT 12B. Hill non-structural sites included in Schutt's analysis listings were: AT 2A (one core), AT 3A (one core), AT 8B (two cores), AT 10B (one core), AT 4C (one core), AT 9C (four cores), AT 12C (two cores), AT 17C (one core), AT 18C (one core) and AT 33C (one core).

Material type 1054 (typical Santa Fe chalcedony) accounted for the bulk of the cores (33 cases). Wood type 1112 accounted for another six cases. The only other material type represented by more than one case was type 1600 gray chert, with two items. Material types represented by only one item were: 1022 cream chert, 1050 white Santa Fe chalcedonic chert, 1060 red jasperoid chert, 1109 splintery fossil wood, 1130 palm wood, 1150 jasperoid wood, 1231 chalcedony w dendrites and 1434 upper Morrison-like jasperoi

From the type 1054 material were made 18 multip cores, five single platform cores, the only bifacial the only exhausted multiple platform core, an exh single platform core and seven of the tested c Type 1112 cores included five multiple platform and a single platform exhausted core. Type 160 were one multiplatform and one single platform The only other single platform core was made 1060. One tested cobble was of type 1022. A items and all other materials occurred a multiplatform cores.

Cortex on multiplatform cores was distributed lows: none (seven cases), 1 to 25% (14 cases), 26 (five cases) and 51 to 75% (four cases). Cortex on platform cores was distributed as follows: non case), 0 to 25% (one case), 51 to 75% (four cases) to 99% (one case). Cortex on tested cobbles was d uted as follows: 26 to 50% (three cases!), 51 to 75 cases) and 76 to 99% (three cases). All other type of low (0 to 25%) cortex coverage.

The distribution of number of flakes per platf tabulated in Table 11-168. It is evident that multiplatform cores had only one flake struck pe form and that cores that produced more than two per platform were anomalous. The small sam single platform cores was typically more produc flakes from a given platform facet, averaging over flakes per platform. This figure would be m considerably if the tested cobbles were included in platform cores, as perhaps they should be. cobbles all reported one flake per platform. Two eight tested cobbles, however, listed two platform core, for a total of ten observations. The one bifac reportedly had three flakes but only one platform sibly a miscode). The exhausted multiplatform co only one flake struck from each of its three platf The exhausted single platform cores produced fou five flakes each before exhaustion.

Reported lengths of flakes produced from multipla cores were examined. Lengths inferred for sc flakes from type 1054 Santa Fe chalcedony multipla cores ranged in length from 13 to 43 millimeters. of abundance were noted at 16, 18, 20, 22, 28 a millimeters inferred length. It is likely that only th 28 and 35 millimeters peaks are significant. Mean scar length was 24.76 millimeters with a sample dard deviation of 7.83 millimeters (Table 11-169).

Reported values of inferred lengths measured for scars from type 1112 conchoidal wood multipla cores were also examined (Table 11-169). They ranged from 15 to 39 millimeters length, with apparent peaks at 14, 18, 25, 28 and 32 millimeters inferred length. None of these peaks was clearly significant. Mean inferred flake length for these scars was 23.43 millimeters with a sample standard deviation of 7.15 millimeters.

These figures are from scars measured on cores drawn mostly from sites which fall into the chalcedony-dominated category. They are, on average, about two millimeters shorter than the comparable mean complete flake lengths for the two material types (see previous section), but they exhibit considerably lower standard deviations than do the samples of complete flakes. The greater variance of the flake measurements relative to the flake measurements inferred from scar lengths probably indicates that most flake samples contained both small (biface, retouch and shatter) flakes, large flakes whose scars could not be measured and flakes from single platform cores. A total of 20 single-platform core flake scars was measured by Schutt. They ranged in length from 12 to 51 millimeters and averaged 26.75 millimeters, with a sample standard deviation of 8.74 millimeters

The slightly disjointed distribution of single-platform flakes and multiplatform flakes, when intermixed with each other and with flakes from tested cobbles, could easily account for most of the differences in means and standard deviations observed between multiplatform core flake scars and actual complete flake measurements in the Atrisco data. One might conclude that the cores and the product flakes in the Atrisco chalcedony-dominated and small-sample sites are consistent one with another. This was not clearly the case at Placitas and it was clearly not the case at Ball. Evidently, it is not unreasonable to infer that the Atrisco sites' occupants may actually have supplied their flake needs locally, either in the sites actually studied in this project or else in sites very like them. At Ball, it seemed likely that many of the flakes for which measurements were reported in the general data files had been struck from cores much larger than those analyzed by Schutt.

The same claim of consistency between flakes and bifaces for biface sites cannot be made so strongly. In visits to the Atrisco project area, the author has seen numerous biface flakes and several rough bifaces which he would consider to be functional cores. More such items were collected in later work (carried out by Rio Grande Consultants, Inc.) at AT 35C and other sites described in this report (Matthew Schmader, personal communication; Bertram 1988b; Bertram n.d.c). There can be little doubt that many of the bifaces described as formal tools in the detailed analysis should have been viewed as functional cores or spent cores recycled as tools, and their flake scar measurements recorded accordingly. Most scholars would agree that flake production is a major early aspect of the biface reduction trajectory.

The Atrisco Area Formal Tool Analysis

A total of 151 formal tools from 23 sites of the Atrisco sector underwent coding and special descriptive analysis by Schutt. It appears that almost all chipped stone formal tools from Atrisco were analyzed; exceptions were limited mostly to projectile points. Very little provenience information was available in the formal tool coded files. Exact level and locus provenience was coded for only eight artifacts. The following discussion ignores provenience data at resolutions greater than the site level.

Unlike the Placitas and Ball assemblages, very few illustrations were located for formal Atrisco chipped stone tools; no photographs or drawings are incorporated into this section. The author (Bertram, this volume; Bertram and Burgett, this volume) has discussed the typology and characteristics of projectile points from the Albuquerque area at some length. The reader should consult his discussions in those chapters for details of the appearance and typology of the Atrisco points. Other Atrisco artifacts may be presumed to resemble the Placitas and Ball examples of the same types.

The great majority of Atrisco formal tools were made on Santa Fe/Pedernal chalcedonic cherts or on conchoidal fossil wood types 1112 and 1113. The relative proportions of these materials varied according to the assemblage characteristics of the sites, as was discussed above in consideration of the GLP data from Atrisco. The analytical divisions used in the author's GLP analysis, that is between valley floor and hillslope sites, between structural and non-structural sites, and between chalcedony/core and fossil wood/biface sites, were maintained for the special formal tool analysis. Tables 11-170, 11-171 and 11-172 list the tools reported by Schutt by pooled material type (Santa Fe/ Pedernal, conchoidal wood, obsidian and other materials) according to the character of their provenience as samples from hill, valley, structural, non-structural, wood-dominated, or chalcedony-dominated sites. Sites with very small collections were pooled, as was the case in the GLP study above.

All of the special analysis Atrisco formal tools were completely decorticated with the exception of two biface blanks (10% and 60% cortex), two unifaces (also 10% and 60% cortex) and a wedge (90% cortex). All but six of the artifacts made of wood, chalcedony, chert, or other heat-treatable materials were reported to have been successfully heat-treated (two not heat-treated, two failures, one uncertain). Of course, the few obsidian and metaquartzite items were not heat-treated.

Sites judged to be dominated by the fossil wood/biface/retouch platform complex in the GLP analysis had typically many more artifacts of fossil wood than of other material types. In non-structural sites, the great majority of these tools were classified by Schutt as late-stage bifaces or biface tools. In the smaller sample from AT 37C (the only wood-dominated valley structural site) and from AT 36C (the possibly mixed wood/chalcedony-dominant hill non-structural site), earlier stages of biface reduction seemed to be comparatively much more common, although sample sizes for these two sites were unfortunately low. In all of these sites other than AT 36C, later-stage biface tools tended to be made more often on fossil wood. Biface tools made on any other material tended to be most often classifiable as blanks or early stage bifaces.

Small-sample pooled sites and chalcedony-dominant sites also had rather small pooled samples, which were in both cases dominated by tools made on Santa Fe/Pedernal. In these site categories, there appeared to be a more even distribution of frequencies for the different sequential reduction/refinement stages defined by Schutt. In the small-sample valley pooled sites, there was even a tendency for only very early and very late reduction stages to be recovered, with Schutt's late-stage biface type being the rarest biface stage recorded.

Tools other than typical bifaces were rare in the special formal tool data base from Atrisco. A total of seven unifaces, a drill, a graver, a wedge, a denticulate and a unimarginally and extensively retouched flake were reported from the collection.

Breakage displayed an interesting pattern in the Atrisco formal tool collection. Reported as complete items were two of nine biface blanks, two of 39 early-stage bifaces and two of eight biface-projectile points. All 41 of the late-stage bifaces and all 42 of the biface-bifacial tools (the latest non-point biface reduction stages in Schutt's system) are reported to be fragmentary. The author has not been able to determine how Schutt's fragmentation and complete(ed)ness criteria were applied in these cases. He is struck by the observation that the degree to which a biface fragment would appear regularized (i.e., late-stage/complete[d] in Schutt's system) must be related to its degree of fragmentation. The less edge remaining on an object for one to examine, the less likelihood one has of observing significant edge irregularities on that object, and therefore the greater the likelihood that it will be perceived as regularized [...] hence classified as being late stage/complete[d]).

It seems likely, therefore, that Schutt's classific[...] tended to classify smaller fragments as belonging [...] later reduction stages and more complete (i.e., [...] reduced) pieces as belonging in the earlier stages. [...]natively, the probability of breakage through u[...] through reduction errors undoubtedly increase[...] biface reduction and regularization continued. [...] might well expect only broken pieces of the later-s[...] higher-investment bifaces on these sites.

The reports of wear from 32 of the 151 tools describ[...] Schutt may offer some insight into this interpr[...] problem (Table 11-173). Wear was reported as "pri[...] wear" if it was wear resulting from the planned eve[...] use of the tool, as the author understands Sch[...] intent. Primary wear was invariably on items class[...] as non-biface tools (i.e., on unifaces, a denticula[...] retouched flake), on late-stage bifaces (one case), [...] items classified as biface tools (terminal stage bifac[...] Schutt's system) or on a projectile point (one case[...]

The reported cases of secondary wear (of unspec[...] character) occurred on two early bifaces, a late b[...] and on a possibly miscoded item listed as an early-[...] biface/projectile point. Why the wear in these [...] cases was coded as secondary is not known. In [...] author's view, it is to be expected that earlier b[...] stages would commonly exhibit primary (i.e., nor[...] planned, expected) wear of a variety of types on a [...] range of edge shapes and angles.

Data on size characteristics (Table 11-174) of the [...]ous tool types reported from these collections indi[...] that fragmentary bifaces are commonly not very m[...] smaller than items coded as complete but otherwi[...] comparable type. The maximum value for width of [...] stage biface fragments (161 millimeters) would see[...] be a coding error, as would the thickness maximum [...] projectile point fragments (28 millimeters). The re[...] will note very little variation in the size of com[...] unifaces. Perhaps this indicates standardization of [...] tool in the Atrisco assemblages. There is rather [...] variation in the size of complete bifaces inferred fro[...] statistical range of fragment sizes reported.

The ranges of lengths, widths and thicknesses of bi[...] fragments of different reduction stages are consiste[...] much smaller than are the comparable size data [...] unbroken but otherwise comparable items. While [...] observation is expected for length and perhaps exp[...]able for width, it is unanticipated for thickness. [...] author would have thought that most biface fragm[...] would tend to be nearly as thick as complete biface[...]

the same reduction stage. However, the unexpected pattern may indicate nothing more profound than that thinner examples of earlier stages of biface reduction are more likely to break than are thicker examples as reduction continues.

Interestingly, the inferred typical length and width ranges of bifaces are consistent with the observed mean dimensions of complete flakes (see the GLP analysis section above). A typical larger biface flake is, in the author's experience, on the order of half as long as the width of the biface core from which it was struck. It is typically about a fifth as wide as the biface was long. The mean dimensions of Atrisco fossil wood and chalcedony flakes from biface/fossil wood-dominated sites would imply (using these speculative proportions) the presence of biface cores having sizes on the order of 28 to 31 millimeters wide and 60 to 75 millimeters long. These estimates are near the range of observed lengths for complete blanks and early bifaces (49 to 94 millimeters long), and also the mean widths for complete and fragmentary blanks (39.0 and 32.3 millimeters respectively) and complete and fragmentary early-stage bifaces (44.0 and 27.7 millimeters respectively) from the Atrisco sites. As far as can be judged, these estimates of biface flake sizes match the typical flakes for the biface-wood sites about as well as the estimates from core product flake scar lengths match the typical flakes from chalcedony-core dominated sites (refer back to the Atrisco core special analysis section above).

Schutt recorded only two of her several wear types in the course of the Atrisco analysis; these were unidirectional hard wear and bidirectional (intensity unspecified) wear. Unidirectional hard wear was about equally common on bifaces and on other tools. Functional (i.e., uneroded or fresh) edge angles were not recorded, but use angles (i.e., the commonly worn angle of the actual use locus) for this wear type were typically obtuse (47 to 80 degrees) for unifaces. The early stage biface with secondary unidirectional wear had an angle of 60 degrees, as did the marginally retouched flake, the projectile point and one biface tool. The late-stage biface had (secondary) unidirectional wear on an edge angle of 37 degrees. The remaining four biface tools with unidirectional hard wear had edge angles of 32 to 42 degrees.

Schutt found bidirectional wear only on bifaces and the single denticulate fragment. The denticulate and the second (secondarily worn?) early-stage biface had wear angles of 25 degrees. A late-stage biface had a wear angle of 38 degrees. The (miscoded?) early biface/point had a wear angle of 37 degrees. The 15 remaining worn biface tools ranged in worn edge angle from 28 to 40 degrees, with 28 and 37 degrees being the edge angles most commonly reported.

It seems noteworthy that relatively few of the flake platforms reported from the Atrisco sites had edge angles as small as the use angles typically reported for the worn Atrisco bifaces, even though the use angles may be assumed to be more obtuse (because they were more abraded and worn) than the other edge angles of the bifaces in question. This fact can be interpreted in several ways. First, it may be that few bifaces were ever reduced or resharpened on these sites; this hypothesis seems *a priori* unlikely. Secondly, it may be that core reduction was so much more common than biface reduction that the biface reduction flake numbers were simply swamped by the much-more-abundant core flakes, with their generally more obtuse platforms. This second hypothesis also seems counter-intuitive to the author.

Finally, it may be that bifaces were routinely dulled by beveling "retouch" in preparation for the next round of reduction. In this case, the measured platform angles of the product flakes (if measured near the platform-dorsum edge) would have much more obtuse platform angles than did the biface from which they were struck (before beveling, that is). The author would expect this hypothesis to be strongly verified by more detailed analysis of flake platform morphology and by refit studies, should these ever be carried out on the Atrisco collections. In his experience, most platform preparation for biface reduction is not done by grinding, but by beveling. The resulting platform angles, if measured <u>very near the platform-dorsum margin</u>, will lie in the neighborhood of 50 to 75 degrees. They will produce flakes having platforms classifiable generally (under the Chapman-Schutt and Fisher-Legare-GLP definitions) as <u>retouch</u> platforms, or as multi-facet platforms under most modern protocols (e.g., the discussions at the first Ghost Ranch Lithic Concordance Conference, currently being prepared for publication). Lesser frequencies of collapsed platforms, stepped platforms and single facet platforms (facet platforms in the Chapman-Schutt and GLP usages) will also be produced in typical reduction of this sort. These patterns will hold whether the reduction is done using hard hammer or soft hammer (baton) reduction techniques.

In summary, the Atrisco formal tools analyzed by Schutt seem to verify the observations made above in the GLP Atrisco analysis: sites dominated by fossil wood debitage, facet and retouch platforms, and bifaces tended to have high proportions of late-stage (and perhaps fragmentary) bifaces, made most commonly of fossil wood. Sites with dominantly Santa Fe/Pedernal debitage, cortical and facet platforms, and cores tended to have more early stage (or perhaps less fragmentary) bifaces and bifaces made on Santa Fe/Pedernal chalcedonies and cherts. The sites which deviated farthest from this pattern were the problematic or mixed strategy site, AT 36C, and the small-sample pooled sites. The edges reported as worn by Schutt may provide some insight into use techniques for bifaces and non-biface tools in the Atrisco sites. In general, acute edges tended more often to exhibit cutting wear, but hard unidirectional (i.e., scraper) wear was also present, especially on incompletely regularized (and/or perhaps more intact) bifaces and on a point. Wear on earlier-stage (less fragmented?) bifaces was interpreted by Schutt as secondary wear, while wear on later-stage bifaces was almost always interpreted by Schutt as primary wear.

The Atrisco Groundstone Special Analysis

Of the many items of groundstone recovered at Atrisco, it appears that only three were ever fully analyzed. These all came from AT 2C. They will now be described.

The first item is a fragmentary two-hand mano, of medium-grain generic metaquartzite. It had two convex grinding surfaces, and was 103 by 73 by 48 millimeters in size. The second item is a probable mano fragment, of coarse generic metaquartzite. It had one convex surface, and was 65 by 65 by 44 millimeters in size. The third item is a probable metate fragment, coded as being made of fine grained vitrophyre, and therefore almost surely actually made of basalt. It had one concave surface, and was 99 by 52 by 24 millimeters in size.

Atrisco General Summary

There seems to be little difference among samples from Atrisco when viewed as assemblages from structural vs. non-structural sites, or as assemblages from hill slope vs. valley floor sites. There are, however, profound differences which crosscut the topographic and structural dimensions. These differences relate to the reduction technology employed to provide flakes and cutting tools by the prehistoric residents of this area.

One assemblage type is dominated by the reduction of Santa Fe/Pedernal chalcedonies and chert, with lesser frequencies of fossil woods. Reduction is core-based. Platforms are mostly of the cortical and (single) facet types. Bifaces are rare, and those that are present are commonly made on chalcedony.

The second assemblage type is dominated by the reduction of fossil woods, almost exclusively of the conchoidally-fracturing co-types 1112 and 1113; Santa Fe/Pedernal occurs as a secondary material type. Reduction is predominantly biface-based. Platforms are mostly (single) facet or retouch (i.e., multi-facet) in type. Bifaces are more common than are other core types, and most of them, especially the more formalized ones, a made on fossil wood. Most bifaces are type 1112; t later stage ones tend to be made a little more often rarer or more exotic materials.

Table 11-175 contains comparisons of the differe classes of Atrisco sites made in terms of common chippe stones artifact type frequencies, status biface-dominant or core-dominant assemblages, top graphic placement and association with structu remains. Due to the uncertainty of collection procedu uniformity, no effort will be made in this report examine the more subtle differences between the va ous strata shown in the table, but the reader should no that differences are present. The overwhelming trend for sites to segregate according to whether they a biface-dominant or core-dominant. The reader will no that the different strata tend also to vary (to a less degree) in their abundances of small angular debr scrapers, unifaces, ordinary cores and exhausted core all of which are formally rather similar types. It is like that these lesser variations are meaningful. Futu studies which can maintain closer control over sampli procedures may obtain valuable insights into the h versus valley and structural versus non-structural pa terns suggested in the Atrisco data.

It is unclear whether the biface-based and core-base Atrisco technologies are chronologically distinct. Ce tainly the PaleoIndian, Archaic and earlier Formati sites elsewhere in New Mexico tend to have a high biface reduction fraction than do later Formative site However, other interpretations can also be advance which can account equally well for the patterning d scribed.

Simple seasonal variation in mobility, for exampl might produce assemblages from summer farming sit in which tools were made by busy people on locall available cobbles, where materials were selected proportion to immediate availability and where produ tion of edges was done by the quickest method availab (i.e., simple core reduction). Non-farming season occ pations might reflect much higher mobility, le immediate time pressure, the need for more reliable ar versatile tools and greater emphasis on logistic huntin In this case the biface-based assemblages may refle late summer retooling for the next season's activitie together with dumping of the old, used-up tools picke up on the last year's forays and with the inclusion actual hunting camp occupations during periods whe the local area was relatively abandoned.

Some of the biface-reducing occupations may indee have been Archaic or early Formative, but there is litt justification in the Atrisco data for the inference that a ere. It is equally reasonable to suppose that gathering frays by Archaic groups would often have expediently rduced local materials to provide cutting edges which ere abandoned on site after use. These core/chalcedony assemblages need not differ in any important gard from expedient core/chalcedony farming assemlages produced thousands of years later. These lithic ajectories alone have no chronometric implications, but coupled with better dating and a stronger theory of the contexts in which bifaces versus cores would be preferentially used (as is presented in nascent form by Kelly [1988], for example), the vivid trajectory differences in the Atrisco sites may eventually provide valuable data for the understanding of Archaic, Formative and later adaptations in the Rio Puerco Valley.

Chapter 12 • Ceramics

A. H. Warren and Dan Warren

Introduction

This study focused primarily on identification of pottery types, possible source areas, and temper types among ceramic samples collected from the Albuquerque project areas. Once pottery types were identified for the different survey areas, efforts were made to determine the temper type or types for each pottery type. Upon identification of the temper material, usually crushed rock, the temper composition could be compared to the geological formations and available mineral resources in the general vicinity. If the tempering materials did not occur in the area where the ceramics were collected, this would indicate in some instances that the ceramics were manufactured in other areas. Dates of possible manufacture were also suggested for most pottery types. Ceramic dates were based primarily upon design, paint types, vessel form, rim type and other construction characteristics.

Atrisco

The Atrisco survey area, located along the Rio Puerco, is characterized by numerous sedimentary deposits. Most of the sediments are derived from aeolean processes. Some volcanic formations are present nearby, such as the Cerro Colorado volcanic plug just south of Interstate 40, and the basaltic flows and volcanoes on Albuquerque's west mesa. Nevertheless, sedimentary sandstones are predominant among temper types for the Atrisco ceramics. It is believed that many of these ceramics were made locally. However, sedimentary deposits similar to those found in the Atrisco survey area occur over a widespread area to the west and northwest in New Mexico. This factor makes it somewhat difficult to define source areas in this region.

The central Rio Puerco Valley is characterized by high windswept ridges and plains, with sand dunes and barren grasslands on the high surfaces of Ceja Mesa to the east, and broad barren flats on the bajada or valley floor accompanied by deep vertical-walled gullies and wide sandy and shallow arroyos. Badlands occur frequently at higher elevations. The meandering, tree-lined channel of the Rio Puerco, with vertical walls and intermittent flows of muddy water, is the dominant feature of the local area.

The higher ridges bordering the Rio Puerco are at altitudes of about 5600 feet, while in the vicinity of the Rio Puerco Trading Post, the river channel is at 5280 feet. The high mesa east of the Rio Puerco valley has been variously called Llano de Albuquerque, Ceja Mesa, and "West Mesa." The mesa is underlain by sediments of the Santa Fe Formation (Tertiary-early Pleistocene) and post-Santa Fe deposits of Ortiz gravel capped by a well-developed caliche and numerous sand dunes.

The Rio Puerco is the major drainage in the central Rio Puerco valley and flows almost due south to join the Rio Grande at Bernardo, New Mexico. Its headwaters are in the Nacimiento Mountains in northern New Mexico. Although it contains a permanent stream of water in its upper reaches, the flow becomes intermittent in its central channel. All of its tributaries have ephemeral channels and carry water only after a rainfall, with the exception of the Rio San Jose which is fed at least part of the year by springs.

Major landmarks in the central Rio Puerco valley include La Mesita Negra, a faulted basalt sill, and Cerro Colorado, an igneous intrusive on the east side of the river south of Interstate 40. Mesa Gigante lies to the northwest and Lucero Mesa to the southwest. The rolling Llanos del Rio Puerco border the west side of the Rio Puerco valley.

Within the valley there are numerous low ridges or *lomas* that extend from the edge of the greater valley toward the Rio Puerco. The valley may have widths between bedrock exposures varying from 1.5 kilometers at the Rio Puerco Trading Post to more than four kilometers to the north and south. The width of the *caja del rio*, or box of the river, ranges from less than 200 meters to more than 1,000 meters in its middle reaches.

The Rocks of the Middle Rio Puerco Valley

The oldest rocks exposed in the central Rio Puerco valley are sandstones, shales and mudstones of the Upper Cretaceous. Within the study area, the Upper Cretaceous rocks are confined to the western side of the valley, although immediately north of Rio Puerco Trading Post and site AT 31C, a small outcrop of the Cretaceous rocks can be seen on the east wall of the *caja del rio*. Clay deposits of possible pottery quality and yellow ochre were noted in the deposits north of this site.

A few small outcrops of the Zia Member of the lower Santa Fe formation occur about 15 miles north of the trading post. The Zia sandstones are generally light gray, buff, or pink, and are characterized by concretionary forms, many tubular, and others in ball forms. One

---

Editor's Note: This chapter was prepared primarily by A. H. Warren prior to late 1986. Additional material, mainly tables, was added in 1990 by Dan Warren, who worked under the supervision of the senior author.

outcrop in this area contained large cobbles or clasts of glassy rhyolite or intermediate volcanic rocks suitable for artifact production. The glass volcanic rocks are uncommon in the middle Rio Puerco and middle Rio Grande Valleys, but do occur in later gravel deposits and were utilized by early occupants of the Rio Puerco in tool production.

As in the Rio Grande Valley, the middle and upper Santa Fe Formation beds constitute the bulk of the rocks and sediments in the valley of the Rio Puerco. These include fine-grained basin deposits, including numerous volcanic ash beds both fresh and altered, and the pebbly-sand deposits of the Ceja Member of the Santa Fe.

Post-Santa Fe sediments include the Ortiz gravel, and extensive sand dunes overlying the Ortiz gravel stratigraphically along the Ceja del Rio Puerco. Above the Ortiz gravel and underlying the dune blankets, the caliche of a well-developed soil forms a prominent scarp overlooking the Rio Puerco from the east. This white scarp has been named the *Ceja del Rio Puerco*.

Igneous rocks of the central Rio Puerco include the red igneous and altered sediments of Cerro Colorado, which is a prominent landmark southeast of the Rio Puerco Trading Post; the tilted basalt flow or sill east of the trading post; the Benavidez diatreme, which forms a mesa in the Rio Puerco valley north of the Sandoval County line; and the Cat Hills, a volcanic flow in the Ceja Mesa west of Los Lunas, New Mexico.

Late Pleistocene and Holocene Geology

Following the deposition of the Ortiz gravel, probably during the early Pleistocene, a soil developed on the basin surface resulting in a well-developed caliche which is now exposed along the scarps of Ceja Mesa (Llano de Albuquerque). Sometime during the Pleistocene, extensive faulting took place in the Rio Puerco and Albuquerque basins. Although there is evidence that the Rio Grande had been a through-flowing river prior to the faulting, the Rio Puerco channel was undoubtedly formed by numerous north-trending faults.

Faulting appears to have dropped portions of the caliche deposits and the underlying Ortiz channel gravel down into what is now the Rio Puerco. The gravel deposits have since been eroded to the extent that they now constitute ridges extending out on the valley floor of the Rio Puerco. Post-faulting channels may also appear as ridges of reworked Ortiz and Ceja gravels, as faulting has apparently continued intermittently throughout the late Pleistocene period.

Within the lower Rio Puerco, from State Highway 6 s to Ladron Mountain, the occurrence of obsidian cob from the Mt.Taylor area indicates that the gravel de its in which the obsidian is found were laid dow ancient channels flowing from the northwest to southeast, joining the Rio Grande prior to the estab ment of the Rio Puerco channel. Although the Mt. Ta obsidian does not occur in the Ortiz gravel nort Highway 6, it is otherwise stratigraphically and li logically consistent with the Ortiz gravel of the lowe Puerco.

Other post-fault deposits include the bajada deposi valley fill, which are aggradational, and alluvial deposits composed of material eroded from the Mesa or the Llanos del Rio Puerco highlands. Ec sands may be present on hillslopes, as thin blanket the bajada, and as falling or climbing dunes within box of the Rio Puerco.

Geological Resources of the Middle Rio Puerco

A primary resource of the middle Rio Puerco valley is lithic materials available for tool production. The C gravel, which crops out in many localities along the Puerco valley or is redeposited in channel and allu fan deposits, contains one of the most important sou of flaked stone raw material in the Southwest.

The chert most characteristic of the lithic material the Ortiz gravel is chalcedonic, with a clear to mi opaque matrix with varying amounts of black dend inclusions. Red, yellow and milky inclusions may be present, and overall colors may range from c colorless to black (lithic codes 1050-1054). Sim chalcedonies occur on the southern slope of C Colorado.

Another common chert is a yellow-brown jasper v olive brown chalcedonic inclusions. Isogonic band may be present and the natural cortex is generall light-creamy tan (code 1073). There appears to b gradual transition from this chert type to yellow-br jasper with black mossy inclusions (1072); red purple shades may also be present. Silicified wood varying colors are present in the Ortiz gravel and generally of good knapping quality.

Red mossy agate (code 1430), probably weathered fr the Morrison formation of Jurassic times, which cr out extensively along the eastern San Juan Basin another common lithic material occurring in the O gravel. Quartzitic sandstone cobbles of knapping qu ity also are common in the gravel (code 2205); these also from the Morrison.

Large clasts of sandstone, limestone, basalt and granite may be common in the Ortiz gravel, indicating nearby proveniences for these materials. Many of these are suitable for metates or building materials. Occasionally, the sandstones of the Santa Fe Formation will be indurated at varying levels in the exposures. An outcrop of ash fall tuff south of Cerro Colorado occurs in thin tabular form, frequently cherty (code 1503), but also altered to siltstone or mudstone. Its color is off-white, occasionally with pink or light gray tinges (code 2252). This material is frequently found on sites in the area, but its use by prehistoric inhabitants is not certain. Slabby sandstones may also occur at various elevations within the Santa Fe outcrops on higher valley slopes.

Clays that may be suitable for pottery-making were noted in the outcrops of the upper Cretaceous. Some of the clays are colored with limonite and could be used for pigments. Ironstone concretions also occur in the Ortiz gravel.

Pottery of the Middle Rio Puerco

Potsherds were recovered from at least 30 sites and 14 isolated finds in the Middle Rio Puerco during surveys and excavations of the Elena Gallegos Project in 1981 and 1982. The ceramics span a time period from A.D. 500, or earlier, to perhaps as late as A.D. 1900. Potsherds were sparse at many of the sites, but did provide information concerning periods of occupation in the Rio Puerco valley.

The scarcity of pottery at many of the sites may indicate brief occupations, which suggests mobility among the early inhabitants. The characteristics of paste and temper suggest that imported ceramics come particularly from the Rio Salado drainage basin, or perhaps from the Acoma area to the west. White-firing clays are common in both areas and appear to be from the upper Cretaceous formations. Brown-firing clays are also available in the Rio Salado drainage and were apparently selected to produce utility wares. Major occupations were noted during the Basketmaker III period, about A.D. 500 to 875, and in the Puebloan era from about A.D. 1050 to 1350. Three historic sites, dated about A.D. 1700 to 1900, had ceramics produced by Hispanic potters.

The pottery types commonly found in the area are shown in Table 12-1 starting on page 262. Table 12-2, provided for reference, shows the Rio Grande glazeware chronology.

A catalog and description of isolated sherds from the Atrisco sector is given in Table 12-41, at the end of the Atrisco section of this report. This is followed by Table 12-42, which gives the lithic codes of the Atrisco study area.

Site AT 1A

A total of 28 potsherds was collected from the surface of AT 1A. The site has been described elsewhere in this volume by Jack Bertram.

Two, and possibly three, different temporal ceramic groups were identified at the site. The earlier group dates between A.D. 500 and 875 and includes Lino Gray, Kana'a Gray and early Kiatuthlanna Black-on-white with crushed sandstone temper. Kiatuthlanna B/w of a later period generally includes crushed sherd temper.

Neckbanded ware, Kana'a Gray, is an early Basketmaker III period utility ware that apparently was produced well into the 1200s and 1300s. The one potsherd of Kana'a Gray is tempered with coarse-grained sandstone and may be from an early Basketmaker III period vessel or from a later period (Table 12-3).

Site AT 3B

A total of 139 identifiable potsherds was recovered from AT 3B, dating between A.D. 950 and about 1400, with best dates about A.D. 1050 to 1200 (Table 12-4). Thirty two of the potsherds were analyzed for temper and source areas, indicating that most of the sherds were produced in the Rio Salado and Upper Little Colorado regions (Table 12-5). However, eight utility sherds contained Tijeras schist temper, indicating contact with villages in the Tijeras Canyon area. The presence of Corona Corrugated with Tijeras schist temper at the Rio Puerco sites, including AT 3B, suggests that distribution of this type was part of an east-west exchange system.

One sherd of Reserve Black-on-white with lavender glaze-paint may be from a vessel produced in eastern Arizona. Other sherds with white-firing clays are probably from vessels produced with Cretaceous clays in either the upper Little Colorado valley or in the Rio Salado drainage south of Acoma.

Site AT 5B

One sherd of Acoma Polychrome was examined from this site; three other sherds are apparently from the same vessel. The sherd examined measures about 5.5 by 10.0 centimeters, and is from an oval-shaped jar. The sherd is abraded on one edge, but may have been broken during or after utilization.

Table 12-1. Pottery Types of the Atrisco Area, Middle Rio Puerco Valley, New Mexico (modified after Mera [1 1943]; Breternitz [1966]; Dittert and Ruppe [1951], and others).

Pottery Type	Dates (A.D.)	Distinguishing Attributes
Basketmaker Wares		
San Marcial B/w*	500-875?	White to cream paste; often contains white to black residual clay plates or pellets. Temper coarse-grained: crushed sandstone, horneblende latite; rhyolite tuff; paint: black, brown, or red mine designs include fine parallel lines, ticking, sawteeth, chevrons, cu motifs; large solids; interior poorly to well polished.
Kiatuthlanna B/w (early)	500-750	White to cream paste; crushed sandstone temper; motifs similar to San Marcial but with a wider range of motifs; chalky dull clay with white clay pellets.
White Mound B/w	500-850	White to cream paste; gritty surface with coarse grains of quartz; motifs are large triangles pendent from rims; chevrons; ticked lines, painted rims; "Zs".
Lino Gray	500-875	Plainware, unpolished; coarse grained sandstone temper; colors of paste range from white, tan, gray, cream, orange to red; walls indurated; not slipped; forms bowls, jars, tecomates.
Lino Polished	500-650	Plainware, polished surfaces + fugitive red.
Lino Smudged	500-650	Plainware, interior of bowls smudged.
Lino Red	500-660+	Plainware, red slipped; sandstone temper; coarse-grained.
Kana'a Gray	500-1300+	Neckbanded; not polished; temper varied — coarse to fine-grain sandstone; surface is rough; scrape marks common; Kana's style persists into the A.D. 1300s.
La Plata B/w	500-850?	White to cream paste; mineral paint; rough surfaces + red exterior pigment; sandstone temper; motifs geometric: often isolated: framed crosses; dots enclosed by parallel lines; "Zs"; pendent triangles, lines, flags, etc. May have black, green glaze designs (Hayes 1964).
Brownwares		
Alma Plain	500-1300+	Tan to brown paste; temper usually rhyolite or other volcanic rock; surfaces of vessels polished; forms include bowls, jars, and *tecomat* Vessel colors probably due to colors of volcanic clays used in production.
Alma Plain, washboard	as above	As above. Alma Plain with smeared neckbanding.
Brownware, polished	500-1400	As above.
Brownware, smudged	as above	Interior of vessels smudged and polished; occasionally exteriors are smudged.

*Synonyms in part: Kiatuthlanna B/w (early); La Plata B/w; and White Mound B/w

Table 12-1. Pottery Types of the Atrisco Area, Middle Rio Puerco Valley, New Mexico (modified after Mera [1935, 1943]; Breternitz [1966]; Dittert and Ruppe [1951], and others) (Continued)

Pottery Type	Dates (A.D.)	Distinguishing Attributes
Brownware, undifferentiated		
El Paso Brown	900-1400	Paste friable; buff to light or medium brown, occasionally dark red; temper fragments are coarse igneous rock; jar and bowl forms.
Los Lunas Smudged	1175-1400	Paste usually light brown; fine-grained temper inclusions of friable igneous rock; bowl forms with narrow bands and tooled punctate motifs. Highly polished smudged interior (bowls).
Pitoche Banded	1050-1150	Paste as Los Lunas Smudged; coils 5-8 mm; smoothed but not obliterated giving clapboard effect; interior smoothed to well-polished; temper friable igneous rock.
Pilares Banded	?1150-1275	Paste and temper similar to Pitoche Banded; ribs or bands narrow, 3-4mm; slight polish over ribs; walls ca. 5mm.
Redwares		
La Plata Black-on-red	800-1000	Mineral paint designs on orange-red to red surface; includes fine-line hatching; temper: hornblende dacite or latite.
Puerco B/r	1000-1200	Red slips on interior and exterior of bowls; mineral paint designs, interior only; temper white, gray, red sherd + quartz grains; motifs solid lines, triangles, checkerboard, fine-parallel lines pendent from rim.
St. John's Polychrome	1175-1300	Red or orange slips on both sides of bowls, exterior of jars; interior motifs are interlocked and hatched bands on interiors; chalky white exterior paint in wide line motifs; mineral paint interior, brown to black.
Mineral Paint Wares		
Red Mesa Black-on-white	850-1150	Mineral paint designs: pendent dots on lines, triangles; interlocking scrolls; curvilinear triangular solids. Usually white slipped on decorated surfaces; temper finely crushed sherd and sandstone temper.
Cortez B/w	900-1000	Mineral paint designs, mainly ticked or scalloped frets or scrolls similar to Red Mesa B/w; also squiggle hatching as on Kiatuthlanna B/w.
Gallup B/w (early)	900-1150	Mineral paint framed hatching; framing lines same width as hatch lines; sherd and sandstone temper.
Gallup B/w	1000-1125	Framing lines heavier than hatching; heavy black matte paint; often black paint on squared rims.
Cebolleta B/w	950-1100	Designs are opposed hatched and solid elements; white polished surfaces; temper is crushed sherd and sand grains with fragments of black shale particles.
Escavada B/w	950-1150+	White, uneven surfaces; mineral black motifs are large solids.

Table 12-1. Pottery Types of the Atrisco Area, Middle Rio Puerco Valley, New Mexico (modified after Mera [19 1943]; Breternitz [1966]; Dittert and Ruppe [1951], and others) (Continued)

Pottery Type	Dates (A.D.)	Distinguishing Attributes
Reserve B/w	950-1125	White paste; framed hatching + solid opposing motifs; mineral pai
Kiatuthlanna B/w (late)	950-1250	White paste; mineral paint; fine line and checkerboard designs; squiggle hatched elements; sawtooth and rectangular scrolls.
Puerco B/w	1010-1125+	Black mineral paint on white surface; pendent lines from rim; parallel wide lines; stepped triangles; Puerco and Kiatuthlanna B/w may have influenced Snowflake B/w.
Kwahe'e B/w	1050-1250	Black to rust-red paint; motifs include geometric solids, checker board, chevrons, triangles; framed hatching. Streaky white slip; usually gray paste; north Rio Grande.
Snowflake B/w	1100-1250	Black mineral, often glaze paint; white paste + clay pellets or oblate plates; complex well-executed motifs, closely spaced.
Tularosa B/w	1100-1300+	Black mineral paint, may be glazed; paste creamy white; temper coarse sherd and quartz grains; opposing solid and hatched elements; small key figures.
Socorro Black-on-white	1050-1175	Mineral paint motifs in black, red-brown, or yellow brown; thin wal ca. 5 mm; mineral paint has tendency to craze; designs include closely spaced solid elements, stepped frets, triangles, wide lines, checkerboards; temper crushed sherd + igneous rock (latite, rhyoli sandstone, etc.). Associated with Pitoche Banded.
Socorro B/w (late)	1175-1350	See above; associated with Pilares Banded, Los Lunas Smudged.
Carbon-painted Wares		
Chuska Black-on-white	1000-1125	A carbon-paint type produced in the Chuska Valley; tempered with crushed trachyte and potsherds. Decorated with diagonal hatching framed; occasional cross-hatching.
Santa Fe Black-on-white	1225-1350+	Carbon-paint ware + slip; finely textured, compact paste; fine-grained temper, often vitric tuff or fine-grained sandstone; varied motifs. Paste gray to white or blue-gray.
Wiyo Black-on-white	1300-1400	Black solid designs on interior of bowls; carbon-paint; vitric tuff temper; also fine-grained sandstone; + clay pellets; silver mica; or crystal pumice temper. Paste tan, gray to dull greenish; slip same color as paste.
Galisteo Black-on-white	1250-1350	Carbon-paint designs; polished, often crazed surfaces; white slippec squared rims; solid or hatched designs, pendent dots, checkerboarc temper crushed sherd + rock temper.
Glaze-paint Wares		
San Clemente Glaze-Polychrome	1325-1425	Glaze-paint designs on interior bowls; usually red exterior slip, white or tan interior slip; crushed rock and sherd temper. Direct rims.

Table 12-1. Pottery Types of the Atrisco Area, Middle Rio Puerco Valley, New Mexico (modified after Mera [1935, 1943]; Breternitz [1966]; Dittert and Ruppe [1951], and others) (Continued)

Pottery Type	Dates (A.D.)	Distinguishing Attributes
Cieneguilla Glaze on-yellow	1325-1425	Glaze-paint design on interior; occasional red matte motif framed by glaze-paint. Crushed rock and sherd temper; direct rims.
Body sherds, glaze-paint	1300-1700+	Redware, glaze-on-cream + red; glaze-on-white; + red matte outlined by glaze paint; glaze polychrome; glaze-on-pink; crushed rock temper; crushed sherd in early glaze wares.
Historic Wares		
Acoma Polychrome	?1850-1950?	Historic Acoma pottery is characterized by a cream-colored paste and crushed sherd temper. Matte paints are black, red, white. Associated with historic glass, iron, etc.
Casitas Red Casitas Red-on-brown	1750-1900?	Historic redwares are characterized by relatively thicker walls, coarse sandstone temper; Red-on-buff sherds are unique to the historic period post-dating A.D. 1700.
Manzano Black	1750-1900?	A smudged black ware, thin to thick walled, and with temper tradition similar to other Historic Hispanic pottery.
Carnuel Plain	1700-1900?	Thick walled jars; rough exterior walls of vessels, rarely smoothed; jars; coarse-grained sandstone temper common.
Utility Wares - Gray		
Kana's Gray		See above, this table.
Gallina Gray, washboard	?1200-1350?	A gray utility ware, plain; conical base? May have washboard; occasional punctate or incised treatment; sandstone temper, medium-grained, subangular, colorless grains.
Tseh So Corrugated	900-1050+	Coils wide, indented deeply; upper part of jars; temper sandstone; gray paste.
Tohatchi Banded	900-1075+	Coils ca. 7 to 10 mm; may be tooled between coils; zoning or patterning; also incised lines, occasional fingernail punctations; temper medium to coarse sandstone; occasional crushed sherd temper.
Chaco Corrugated	1050-1300+	Corrugated oblique indented style; 4-7 mm band widths; + geometric patterns; gray paste; medium to coarse crushed sandstone temper; synonyms: Tusayan Corrugated; Coolidge Corrugated; Deadman's Corrugated; overall corrugations; jar forms mainly.
Mancos Corrugated	900-1300+	Five varieties include: (1) large indented coils; (2) Tseh So style; (3) smeared indented; (4) patterned with indented, unindented coils; (5) oblique ridging, Payan style. Temper includes crushed igneous, metamorphic, and sedimentary (sandstone) rock.

Table 12-1. Pottery Types of the Atrisco Area, Middle Rio Puerco Valley, New Mexico (modified after Mera [1935, 1943]; Breternitz [1966]; Dittert and Ruppe [1951], and others) (Continued)

Pottery Type	Dates (A.D.)	Distinguishing Attributes
Corona Corrugated	1225-1460	A smeared indented utility ware produced in a number of localiti Synonymous with several other utility types including Tesuque, Prieta, Pajarito, and probably Ochoa Smeared Indented. The latt is considered to be indigenous to southeastern New Mexico. Originally, the utility ware was designated as Corona Rubbed-rib d and Corona Rubbed-indented (Mera 1935).
Corona Plain	1450-1670	The plainware paste is identical to Corona Corrugated, ranging from buff to reddish brown. The temper is fine-grained igneous rock. The Corona Corrugated is tempered mainly with quartz mi schist, while Corona Plain is tempered mainly (74%) with a dike rock, biotite felsite.
Ochoa Indented	1375-1425	The utility ware, Ochoa Indented, has been found mainly in soutl eastern NM, and is tempered with sandstone or crushed caliche.
Rio Grande Plain	1300-1700	This utility type is mainly associated with glaze-paint wares in central and northern New Mexico; interiors are often well-polishe The type is associated with Rio Grande glaze-paint wares.

Table 12-2. Chronological Periods of the Rio Grande Glazes (modified from Mera [1933]).

Group	Type Name	Date of Manufacture (A.D.) estimated
Pre-A	Los Padillas G-P	?1300 to 1325
A	Arenal G-P	?1315 to 1350?
A	Agua Fria G/r	?1315 to 1425?
A	San Clemente G-P	1325 to 1425
A	Cieneguilla G/y, G-P	1325 to 1425
B	Largo G/y, G-P	1400 to 1450
C	Espinoso G-P Pottery Mound G-P	1425 to 1500
D	San Lazaro G-P	1490 to 1515
E	Puaray G-P (early)	1515 to 1600
E - F	Puaray G-P (late)	1600 to 1650
E & F	Pecos G-P	515 to 1600
F	Kotyiti G/y, G/r, G-P	1650 to 1700

The temper consists of fragments of cream-to-o fractures of crushed sherd in a white paste, anc tains plastic residual clay plates from Upper Creta clay. The vessel was slipped with a white paste coı ing flecks of silvery-white miabout

The white paste is hackly, coarse textured and indurated. Spalls mar the exterior surface. The dead white with silver mica flecks.

The painted design appears to be of a bird, done in motifs, and with black-outlining red-paint motifs. 19th to early 20th century date is suggested for pr tion. The probable production source is Acoma P

Acoma Polychrome has been reported from two south of the Rio Puerco Trading Post: LA 27938 a unrecorded site. The unrecorded site includes th of an adobe structure and the foundations of an structure in the vicinity of Bench Mark #5277. A historic site, LA 27938, is an apparent Hispani located on the west bank of the Rio Puerco abou kilometers south of the Rio Puerco Trading Post. ruins of a two-room rectangular and a circular stru are present. Sherds noted appear to be Carnue No Acoma potsherds were found at LA 27938.

'able 12-3. Pottery From AT 1A.

Pottery Type	Vessel Form		Paint Type	Time Range
	Bowl	Jar		
Lino Gray		13	Mineral black	A.D. 500-875
Kiatuthlanna B/w	7		Mineral brown	500-750
Kiatuthlanna B/w	1		Mineral brown	500-750
Kana'a Gray, ca. 5mm		1		500-1300
Mineral/white	1	2		
Socorro B/w		2		1050-1350?
Santa Fe B/w	1		Carbon	1225-1350
TOTALS	10	18		

'able 12-4. Pottery From AT 3B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Escavada Black-on-white	950-1150+	West Central NM	4		4
Reserve Black-on-white	950-1125	As above		2	2
Cebolleta B/w	950-1100	As above		1	1
Puerco B/w	1010-1125+	As above		2	2
Socorro B/w	1050-1350	As above	5	2	7
Chuska B/w	1000-1125	Northwest NM	1		1
Tularosa B/w	1100-1300	West Central NM	1		1
Pilares Banded	1150-1275	As above		3	3
Los Lunas Smudged	1175-1400	As above	1		1
Santa Fe B/w	1225-1350	North Central NM		1	1
Wiyo B/w	1300-1400	As above	1		1
Mineral-on-white	Unknown	Unknown	14	4	18
Carbon-on-white	Unknown	Unknown	1	1	2
Kana'a Gray	500-1300	Unknown		3	3
Chaco Corrugated	1050-1300	Unknown		34	34
Corona Corrugated	1225-1460	Unknown		54	54
Plainware, unidentified		Unknown		5	5
Brownware, smudged		West Central NM		1	1
TOTALS			28	113	141

Table 12-5. Pottery and Temper Classifications of Selected Sherds, AT 3B.

Pottery Type	Temper Definition and Description	Suggested Source Area
Escavada B/w bowl sherds	Fractures of fine-grained white sandstone (2125?); white to light gray paste; red-brown paint.	Rio Salado drainage; an Upper Little Colorado
Reserve B/w jar	Temper and paint as above; paste light orange to light gray.	As above
Reserve B/w jar sherd	Crushed sherd temper; residual clay plates; white to light gray paste; dark brown mineral paint.	As above
Chuska B/w bowl sherd	Crushed sherd temper with Chuska trachyte fragments; white, tan to black paste.	Chuska Valley (?)
Puerco B/w bowl sherd	Fractures of fine-grained Upper Cretaceous sandstone, Mesaverde Group (?), code 2140; crushed sherd; white paste; red-brown paint design.	Rio Salado, Upper Little Colorado drainage areas
Puerco B/w, jar	Temper as above; dark brown paint; solid designs.,	As above
Snowflake B/w bowl sherd	Temper consists of fine fragments of sherd in a white to light gray paste; fine-grained quartz and vitreous, clear feldspar.	As above
Socorro B/w bowl sherd	Hornblende latite temper, Datil Formation, with black hornblende prisms; clear quartz; fragments of sherds; fractures of fine-grained sandstone; residual clay plates, white to black, indicating Upper Cretaceous clays; black paint (codes 3267-70).	Rio Salado drainage (?)
Socorro B/w jar sherds	Temper and clay as above; mineral paint dark brown to reddish brown.	As above
Socorro B/w bowl, jar	Fractures of fine-grained Upper Cretaceous sandstone (2140) and crushed sherd temper in white paste; red-brown paint motifs.	As above
Tularosa B/w bowl sherd	Coarse fragments (1-2mm) of white sherd temper; grading to gray; black residual clay plates.	Upper Little Colorado drainage
Kana'a Gray jar sherd	Very coarse white sherd temper in white paste; bands circa 7.0 mm	Upper Little Colorado or Rio Salado drainages
Chaco Corrugated jar sherd	Coarse (1.0 mm) sherd temper; paste dark brown, weathers white; bands 5 mm. See synonyms below.	As above
Chaco Corrugated jar sherd	Very coarse fragments of white sherd (1.0-2.0 mm); in black clay. See synonyms below.	As above
Chaco Corrugated jar sherd	Temper as above; tan clay weathers white; (synonyms Tusayan, Coolidge, Deadman's Corrugated).	As above
Corona Corrugated jar sherds	Mica schist temper (Tijeras Schist); clay orange-red. (Synonyms, Tesuque, Prieta smeared indented).	Tijeras and/or Coyote canyons
Corona Corrugated jar sherds	Tijeras Schist; paste is red-brown.	As above
Pitoche Banded jar sherd	Coarse to very coarse sherd temper (1.0-2.0 mm); paste white with light brown core; bands 7 mm.	Upper Little Colorado or Rio Salado drainages
Pilares Banded jar sherd	Tempered with fine-grained sandstone (2043) and crushed white sherd; bands 3.5 mm; tan paste.	As above
Los Lunas Smudged	As above; light brown to light red paste.	As above

Table 12-6. Pottery From AT 6B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Socorro Black-on-white	1050-1350	West Central NM		3	3
Chaco Corrugated	1050-1300+	As above?		16	16
Snowflake B/w	1100-1250	Upper Little Colorado	1		1
Mineral/white				1	1
Santa Fe Black-on-white	1225-1350	West Central NM (?)	3		3
Rio Grande Plain	1300-1700	Varied sources		10	10
TOTALS			4	30	34

Site AT 6B

This site consists of a sherd and lithic scatter covering about 80 square meters. A total of 34 sherds was collected from the site (Table 12-6). Five of these were examined for temper types.

FS 5-1: This Snowflake Black-on-white sherd had been utilized (abraded) on one edge and had slight abrasion on a second edge. The sherd had a black mineral-paint design consisting of dotted cross-hatching on a reddish undercoat. The paste is white, with an even block fracture; the surface appears to be floated. The temper consists of crushed white sherd, and sparse-clear to smoky-gray quartz, less than 0.2 millimeter. The source area is probably the Upper Little Colorado.

FS 7-1: This Santa Fe Black-on-white bowl sherd with a carbon-paint motif has a streaky light gray surface; silvery mica flecks were noted on the bowl interior; the temper consisted of light- to dark-gray crushed sherd, clear angular, sparse quartz grains, and a trace of minute black hornblende laths. Aplastic, platy, medium-gray clay fragments are present. The source area may be either the Upper Little Colorado or the Rio Salado drainage, and in particular the geographic areas where pottery clays are suitable for carbon-paint motifs.

FS 16-1: This sherd of Socorro Black-on-white with heavy solid designs in finely crazed, black subglazed paint, has white-to-gray, partly vitrified sherd temper. The paste is medium-gray with fritted clay paste.

Table 12-7. Pottery From AT 8B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Lino Gray (polished neck sherd)	500-875	Rio Grande Valley		2	2
Los Lunas Smudged	1175-1400	West Central NM	1		1
Corona Corrugated (micaceous)	1225-1460	Central NM		4	4
Corona Corrugated (micaceous)	1225-1460	Tijeras Canyon; Manzano Mountains		1	1
Mineral/white				1	1
TOTALS			1	8	9

Table 12-8. Pottery From AT 11B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Socorro B/w	1050-1350	West Central NM	8		8
Brownware, plain		As above		2	2
TOTALS			8	2	10

FS 11-1 and 11-2: These two sherds of Chaco Corrugated date about A.D. 1050 to1300. Narrow bands range from two to five millimeters The paste is light tan to buff, gray, and dark brown. The temper consists of crushed white to light gray sherd, contrasting with the dark paste; fragments of hematite, limonite, and magnetite are mixed with light-gray quartz grains, about 0.5 millimeter in diameter. Fractures of fine-grained light tan sandstone are also present.

The sherds have silvery-mica in the slip and paste. Most characteristics are white sherd fragments in a gray paste.

In summary, all the sherds from AT 6B appear to have been produced in west-central New Mexico, or the Rio Salado drainage basin. The one Santa Fe Black-on-white sherd with white paste but gray surfaces is unusual.

Hornblende prisms in some of the sherds tend to confirm a west-central New Mexico origin. Hornblende latite of the Datil Formation is a common temper type in this area, while the white pastes of the Upper Cretaceous clays were commonly used prehistorically by Anasazi potters.

Site AT 8B

A total of nine potsherds was collected from this including Lino Gray, Corona Corrugated, and one of Los Lunas Smudged (Table 12-7). Six of nine s from AT 8B were examined for temper and oth tributes.

FS 3.1: This Lino Gray sherd with polish on the jar had a white paste and was tempered with co grained sandstone. Temper grains included high-temperature quartz, smoky quartz, orange spar and hematite fragments. These temper inclu appear to be from the volcanic sands of the Ban Formation (Tertiary). The vessel wall was four mil ters thick. The white clay suggests that the vesse have been constructed with white-firing Upper C ceous clays. The temper suggests production in th Salado valley.

FS 1.1: This utility sherd has interior polish paral the rim and coils(?) and polish marks on higher pa corrugations. The clay is black with a dark red brown core, hackly and easily fractured.

Table 12-9. Pottery From AT 12B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
San Clemente G-P	1315-1425	Cochiti area (?)	2		2
Cieneguilla G/y	1375-1450	Tonque Pueblo (?)	1		1
Glazeware G-P			2	1	3
Glazeware, red				1	1
Glazeware, pink				1	1
Unidentified				3	3
TOTALS			5	6	11

Table 12-10. Pottery From AT 1C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Kiatuthlanna B/w (late)	950-1250	Upper Little Colorado	1		1
Socorro B/w	1050-1350	West Central NM	7	5	12
Whiteware			1		1
Mineral/white				6	6
Los Lunas Smudged	1175-1400	West Central NM	1		1
Chaco Corrugated	1050-1300	As above?		2	2
Pitoche Banded	1050-1150	As above		1	1
Pilares Banded	1150-1275	As above		1	1
Brownware	500-1400	As above	1	2	3
Brownware, smudged	500-1400	As above	1	1	2
TOTALS			12	18	30

The temper is quartz mica schist, probably from the Manzano Mountains, possibly Coyote Canyon. The temper matrix is very finely granular with minute black specks, xenoblastic quartz, feldspar crystals, and minute flecks of silver and gold mica.

FS 2.1, 2.3, 2.4: These three sherds of Corona corrugated tempered with Tijeras Schist have nearly obliterated indented coils.

FS 3.1: This sherd of Los Lunas Smudged has a smudged black interior and rhyolite or latite of the Datil volcanics of central and west-central New Mexico. The temper quartz with acute angles, black hornblende prisms and icy feldspar in a light red matrix.

Site AT 11B

Ten potsherds were collected from Atrisco Site AT 11B, representing two pottery types: Socorro Black-on-white and plain smoothed brownware (Table 12-8).

The eight sherds of the Socorro Black-on-white were restorable. The motif is a checkerboard and wide-line design in brownish-black mineral paint. The temper includes crushed sherd, quartz grains and black hornblende prisms, probably from the Datil volcanics. The two sherds of plain, smoothed brownware were tempered with crushed red and black scoria, probably also from west central New Mexico.

Site AT 12B

Eleven potsherds from Group A glaze-paint vessels were collected from this site (Table 12-9). At least two vessels are represented, including a San Clemente Glaze-Polychrome bowl and a Cieneguilla Glaze-Polychrome bowl. Five radiocarbon dates were obtained at the site; however, only one date, A.D. 1410 ±70, corresponds with the glaze-paint pottery types present.

The tempering material of three of the sherds was examined; apparently two of the sherds came from the same vessel.

FS 6.1;10-1: These two sherds of a San Clemente Glaze-Polychrome vessel were slipped white on the interior and red on the exterior. The temper is described as (1) crushed sherd, fine fragments, white to gray; (2) fragments of red vesicular basalt; and (3) altered feldspar(?). Although vessels of San Clemente Glaze-Polychrome may occur earlier in the Group A sequence than Cieneguilla Glaze-on-yellow, the type did persist into the early 1400s.

FS 23.1: This Cieneguilla Glaze-on-yellow bowl sherd has an eroded white slip. The temper is the hornblende latite used by potters of Tonque Pueblo (LA240). The paste color is pale red-brown (10R5/4).

Table 12-11. Pottery From AT 2C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Tota
San Marcial B/w	500-875	Middle Rio Grande	4		4
Lino Gray	500-875	As above		14	14
Socorro B/w	1050-1350	West Central NM	5	8	13
Mineral/white			1	1	2
Whiteware			1		1
St. John's Polychrome	1175-1300	Upper Little Colorado	2	1	3
Los Lunas Smudged	1175-1400	West Central NM	1		1
Pilares Banded	1150-1275	As above		6	6
Chaco Corrugated	1050-1300	Undetermined		1	1
Corona Corrugated	1225-1460	Undetermined		2	2
Brownware		Undetermined		2	2
Brownware Smudged	Undetermined	2		2	
TOTALS			16	35	51

Table 12-12. Pottery From AT 3C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Tota
Red Mesa B/w	850-1150	West Central NM		1	1
Cortez B/w (affinis)	900-1000	Unknown		2	2
Cebolleta B/w	950-1100	West Central NM	1		1
Socorro B/w	1050-1350	As above	1	6	7
Mineral/white, whiteware				1	1
Santa Fe B/w	1225-1350	Rio Grande Valley?	1	2	3
Carbon/white				1	1
St. John's Polychrome	1175-1300	Upper Little Colorado	2		2
Kana'a Banded	500-1300	Unknown		1	1
Tseh So Corrugated(?)	900-1050	Unknown		1	1
Pitoche Banded	1050-1150	West Central NM		2	2
Pitoche Banded (white)	1050-1150	As above?		1	1
Pilares Banded	1150-1275	As above		5	5
Los Lunas Smudged	1175-1400	As above		1	1
Chaco Corrugated	1050-1300	Unknown		3	3
Corona Corrugated (mica)	1225-1460	Tesuque Canyon		2	2
Corrugated, unidentified				2	2
TOTALS			6	30	36

'able 12-13. Pottery From AT 4C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Plainware, utility	Unknown	Unknown		1	1
Los Lunas Smudged	1175-1400	West Central NM	1		1
Pilares Banded	1150-1275	As above		2	2
TOTALS			1	3	4

;ite AT 1C

'he pottery from AT 1C is a sparse assemblage of ›otsherds from Socorro Black-on-white vessels and ıssociated brownware jars and bowls, dating between ı.D. 1050 and 1300. A late Kiatuthlanna B/w bowl herd is tempered with Chinle Sandstone, which is a ommon temper in the San Mateo and Upper Little :olorado areas. The presence of rounded grains of clay ›ellets suggests a western source for the Kiathuthlanna essel; the residual clay particles from the San Mateo ırea are usually platy. Although the potsherds were :ollected from two areas at the site, no cultural or :hronological differences were noted. A total of 30 herds are tabulated in Table 12-10.

;ite AT 2C

ıt least two temporal components can be recognized at ıT 2C. An early Basketmaker component is suggested ›y the presence of Lino Gray and San Marcial Black-on-vhite, and dates about A.D. 500 to 875. A later :omponent, dating between A.D. 1150 and 1400, is characterized by ceramics originating in west-central New Mexico, and includes Socorro Black-on-white and associated brownware utilities (Table 12-11).

Site AT 3C

A total of 37 potsherds was collected from AT 3C. Although there is considerable diversity within this assemblage, most of the types fall within the Pueblo III period of the Pecos Classification or the Coalition period (A.D. 1200 to 1325), and date A.D. 1050 to 1325 (Kidder 1927; Wendorf & Reed 1955) (Table 12-12).

Site AT 4C

Only four potsherds were collected from this site, representing a utility plainware, Pilares Banded, and Los Lunas Smudged (Table 12-13).

Despite the sparsity of potsherds, the four sherds may very well be of the same time period, dating somewhere between A.D. 1150 and 1400. It should be noted that at

'able 12-14. Pottery From AT 6C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Kiatuthlanna B/w (late)	950-1250	Upper Little Colorado		1	1
Cebolleta B/w	950-1100	As above, or Rio Salado		1	1
Socorro B/w	1175-1350	As above	2	12	14
Mineral/white			7	6	13
Pilares Banded	1150-1275	Rio Salado		10	10
Los Lunas Smudged	1175-1400	Rio Salado	3		3
Chaco Corrugated (late)	1050-1300	Upper Little Colorado		1	1
Brownware, unidentified		Rio Salado		8	8
Plainware, unidentified				8	8
TOTALS			12	47	59

least two of the three vessels represented were constructed with white-firing clays, probably of the Upper Cretaceous strata that are common both in the upper Salado drainage and in the Upper Little Colorado. One sherd of unidentified plainware has a yellow-firing paste, a not-uncommon occurrence in clays from the Upper Cretaceous strata.

Site AT 5C

One sherd of Kana'a Neckbanded, dating A.D. 500 to 1300, was found at this site.

Site AT 6C

Fifty-nine potsherds were recovered from this site; all appear to date between A.D. 1150 and 1400 (Table 12-14).

Fifteen of the sherds were analyzed for temper and paste descriptions (Table 12-15). The analysis of the 15 sherds indicates that the pottery was produced in a diverse environment or by a mixed group of potters in west-central New Mexico and the upper Salado drainage basin. The predominance of white wares suggests use of the white-firing clays of the Upper Cretaceous sediments in those areas.

No centers of manufacture of the pottery were identified, although general geographic areas are suggested. The brown-firing clays used to produce the utility wares of west-central New Mexico undoubtedly came from the volcanic provinces, while the white-firing pottery was produced with clays of the Upper Cretaceous sediments. The two provinces are separated approximately by the Rio Salado.

Site AT 7C

Only nine potsherds were recovered from AT 7C, five of which were from Socorro Black-on-white bowls and jars. These five sherds were tempered with crushed sherd and minerals from hornblende latite of the Datil Volcanics (lithic Code 3267). At least two vessels are represented among these five sherds (Table 12-16).

One utility ware sherd of Corona Corrugated was tempered with schist, probably from the Tijeras Canyon area, suggesting distribution from east to west, as well as from west-central New Mexico to the Rio Puerco Valley.

The pottery types present at the site range from about A.D. 1050 to 1300±.

Site AT 9C

At least five different pottery types were identified a
site, among a total of eleven sherds. All sherds were
jar forms. Sandstone temper occurred in all el
sherds, suggesting a relatively early date, between
750 and 1050 (Table 12-17).

All of the eleven potsherds were tempered with med
to coarse-grained sandstone. The coarse-grained s
stone has colored, rounded grains, occasionally
high quartz crystals. This suggests that some o
original vessels may have been produced in the
Grande or Rio Puerco valleys, in particular where
Ceja Member of the Bandelier Tuff is available. It is
possible that more than one temporal period is re
sented.

Site AT 11C

The pottery from AT 11C is an assemblage of 41 his
sherds which date between A.D. 1750 and 1925, or l
(Table 12-18). Thirteen sherds were examined for t
per types and possible source area (Table 12-19).

The 41 potsherds from AT 11C represent a minimu
at least eight different vessels, seven of which
historic. At least one jar of Socorro B/w with hornble
latite of the Datil Volcanics is represented. A sherd f
an Acoma Polychrome jar may be from the early 19

At least six Hispanic vessels are represented at the
The limited number of vessel types and the wall th
nesses, ranging from six to eight millimeters, indica
post 1860 occupation.

The earliest founding date for the settlement of
Atrisco Grant is A.D. 1703. By A.D. 1744 there v
more than 100 families living in the Rio Grande Valle
Atrisco and Albuquerque (Greenleaf 1967).

In 1763, Lorenzo de Santillanes kept 700 sheep and
rams on the Rio Puerco ranch west of the villag
Atrisco (Greenleaf 1967). Other Atrisco shepherds
tablished corrals and ranches during the 17
However, by 1774, all villages and ranches along the
Puerco had been abandoned following attacks by
Navajo. It was almost a century later, in 1864, that
defeat of the Navajo secured the flocks of the Atrisque
along the Rio Puerco.

The potsherds from AT 11C are in all probability fro
post 1864 occupation. Historic pottery from the 17
in general has thinner walls than vessels from AT 1
and a wider range of pottery types is common.

Table 12-15. Pottery and Temper Classifications of Selected Sherds, AT 6C, Middle Rio Puerco.

Pottery Type	Temper Definition and Description	Suggested Source
Kiatuthlanna B/w small jar	Temper: Lt. gray to white sherd+ fine-grained (0.25 mm) quartz; sandstone fractures (1.0 mm) abundant; clay pellets, light gray to oblate (to 1.0 mm); black paint, slightly crazed; sawteeth pendent from rim.	Upper Little Colorado or Upper Rio Salado
Socorro B/w jar	Temper is crushed white sherd (0.2-1.0 mm), 50-60%; clear rounded quartz grains, 20-30%; fragments, angular, of pinkish-gray welded tuff?; and traces of light gray, rhombic fildspar; the paint is medium brown, limonitic and is absorbed by the clay.	Upper Rio Salado West Central N.M.
Socorro B/w jar	Sherd temper is white, irregular to angular with traces of fine-grained (0.1-0.2 mm) quartz. The paste is white to light gray with flecks of silvery mica. Large geometric motifs are painted with reddish brown, spalled mineral paint.	As above
Socorro B/w jar	Angular fragments of white sherd, 0.2-1.0 mm make up 70 to 80% of the temper with 20-30% consisting of clear, subround to subangular high temperature quartz; the clay paste is white, dense and hard with a medium gray core; the break is conchoidal to hackly; flecks of silver mica indicate Cretaceous clay. The paint is red brown to moderate brown (5YR3/4); the motif is solid with pendant ticking.	Upper Rio Salado
Socorro B/w jar	The temper is about 50% crushed sherd, white to gray (0.2-0.5 mm); and 50% clear, subrounded quartz grains, (0.2-0.5 mm). Sparse hornblende crystals point to production in or about the Datil volcanics (intermediate). The paste is white to light gray and the paint is black to lt. gray, crazed mineral paint.	Upper Rio Salado
Socorro B/w bowl	Fine to coarse-grained quartz, medium-grained light gray, icy - feldspar, and crushed lt. gray sherd are present; the paste is light gray; surfaces are well-polished; motifs are painted with red-brown mineral paint; the design has wide-line framed hatching.	Upper Rio Salado West Central N.M.
Whiteware jar	This sherd is tempered mainly with coarse fragments of crushed lt. gray sherd; and clear angular quartz. The very light gray paste includes residual clay plates; slip is carbon stained and polished; it is noted that similar clays occur in the San Mateo area.	As above
Pilares Banded jar	The temper is mainly crushed rhyolite (Hell's Mesa?), and includes subangular, equant quartz; feldspar, including moon stone and sanidine, clear; black hornblende prisms, magnetite octahedrons, and gold biotite. The paste is dark gray to moderate brown (5YR4/4) and has a granular, friable texture; the coils are narrow and are not indented.	West Central N.M., Rio Salado south
Pilares Banded jar	Hornblende latite of the Datil Formation is predominant in this potsherd; in addition is subangular quartz with partial crystal faces; unidentified rounded grains(?) of red color; biotite traces; the paste is dark gray to dark yellow brown and granular; the sherd has corrugated banding 2.5 to 3 mm wide.	West Central N.M. as above
Pilares Banded tooled punctate	The two sherds are tempered with white sherd (1) fragments and fine-grained colored sandstone (Lithic code 2043);Rio Salado-Rio Puerco drainages(?). The paste is white with a gray core.	West Central N.M. or Rio Salado
Los Lunas Smudged	The sherd of Los Lunas Smudged was tempered mainly with Upper Cretaceous Sandstone and crushed sherd; however, minerals from the Datil Formation, including black hornblende laths are also present. The clay is light yellow brown with light gray core; the interior of the vessel is smudged.	As above

Table 12-16. Pottery From AT 7C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Socorro B/w	1050-1350	West Central NM	2	3	5
Mineral/white				1	1
Corona Corrugated (Tijeras Schist)	1225-1460	Tijeras Canyon?		1	1
Chaco Corrugated	1050-1300±	West Central NM?		1	1
Plainware			1		1
TOTALS			3	6	9

Table 12-17. Pottery From AT 9C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Tota
Lino Gray	500-875	Rio Puerco Valley?		3	3
Kiatuthlanna B/w (early)	500-750	West Central NM?		4	4
Washboard Corrugated	500-1350?	Unknown		1	1
Chaco Corrugated	1050-1300	Middle Rio Grande?		2	2
Brownware, smudged	500-1400	West Central NM		1?	1
TOTALS			0	11	11

Table 12-18. Pottery From AT 11C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Socorro Black-on-white	1050-1350	West Central NM	3	3	
Acoma Polychrome	?1850-1950	Acoma area		1	1
Casitas Red-on-brown	1750-1900	Atrisco or Rio Puerco	1		1
Casitas Red	1750-1900	As above?	4		4
Manzano Black	1750-1900	As above?		1	1
Carnuel Plain	1700-1900	As above or Rio Grande		20	20
Redware polished	1750-1900	As above		1	1
Buffware polished	1750-1900	As above		8	8
TOTAL			5	34	39

_able 12-19. Pottery and Temper Classification of Selected Sherds, AT 11C, Middle Rio Puerco.

-'ottery Type	Temper Definition and Description	Suggested Source
ocorro B/w and grayware, 1 jar, 2 bowls	Quartz, clear vitreous with acute angles (35%); crushed white sherd, angular (45%); black hornblende prisms to 0.5 mm (5%); silvery mica in paste; mottled gray polished slip; brown-black crazed mineral paint; motif is opposing parallel lines with pendant dots. Hornblende latite temper.	Rio Salado drainage; Datil Formation
:asitas Red-on-brown bowl, hemispherical	Quartz sandstone temper, subround to round grains; 0.1 - 0.5 mm, 80-90%; residual medium gray (N6) clay particles and patches; traces caliche; black grains (5-10%); paste red-orange (10R6/6); finely granular; stone-stroked parallel to rim; walls 6 mm.	Rio Puerco valley?
:asitas Red 1 jar rim	Spec. 30-1: Redware polished; open deep bowl, temper; same as 32.1 + snail shell; wall 6.25 mm; one edge of sherd abraded; fine to med. sand.	As above?
	Spec. 11.1: Redware jar sherd(?); temper as 20.1 above; Spec. 32.1: Redware bowl rim; wall 6 mm. Fine to medium grained sandstone.	Undetermined
/lanzano Black closed form	Temper: Medium to coarse-grained, subangular to angular, clear to lt. gray quartz; lt. gray to orange chert fragments, 5%; clay lt. brown (5YR6/6) interior; med. lt. gray (N6) paste; granular, vitrified; smudged, polished black exterior.	Rio Puerco or Middle Rio Grande?
:arnuel Plain jar	Wide mouth jar with slightly everted rim; temper is Ceja Mb. .Tsf. sandstone: clear to smoky quartz±doubly terminated quartz crystals; white, red mossy, black, lt. orange chalcedony; icy clear chatoyant feldspar (1-2 mm); also 12 sherds.	As above
3uffware red jar base?)	Temper is coarse sandstone, Ceja Mb? + hornblende, as above; earthy hematite; indurated; paste lt. red (mod. reddish orange, 10YR6/6; hard, even to hackly fracture.	Rio Puerco Valley?

Table 12-20. Pottery From AT 12C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Casitas Red-on-brown hemispherical	1700-1900	Middle Rio Grande	2		2
Carnuel Plain	1700-1900	As above?		2	2
Kana'a Gray(?)	?	Upper Rio Salado or Upper Colorado	2		2
TOTALS			4	2	6

An occasional occurrence of small snail shells in the paste of historic Hispanic pottery types suggests that cienega clays rather than clays obtained from named geological formations were used by Hispanic potters. Examination of the inclusions of many thousands of Puebloan potsherds has yet to disclose any small snail shells in Pueblo pottery. Other Hispanic pottery with small land snails includes sherds of Carnuel Plain, in Tijeras Canyon, and near Las Huertas, north of Placitas, New Mexico.

The one potsherd of Acoma Polychrome found at AT 11C resembles a vessel pictured by Harlow (1973: Plate 28a). However, production dates are not substantiated at this time.

Site AT 12C

Three vessels are represented in this small assemblage of six sherds (Table 12-20). Two of these are historic Hispanic types while the third vessel appears to be a historic utility jar resembling somewhat the style of Kana'a Gray.

Casitas R/b and Carnuel Plain appear to be nineteenth century Hispanic wares, possibly produced in the Albuquerque area. The Kana'a Gray (?) sherds fit together. The vessel that they are from was tempered with coarse angular fragments of white sherd, possibly from Acoma or the Zuni area. The wide fillets give the appearance of the earlier Kana'a Gray; the production date remains in question at this time.

A fragment of white snail shell (Table 12-21) is characteristic of pottery made by Hispanic potters. Snail shell inclusions indicate use of local unconsolidated clays along streams. Pueblo potters invariably select clays from older, sedimentary beds.

Site AT 13C

AT 13C is a sparse assemblage of lithic flakes and potsherds. Two whiteware sherds from a closed form have an exterior polish and appear to be from Sc Black-on-white jars. A plain utility ware from a gra jar may be Lino Gray, or possibly a sherd from the of a grayware utility jar.

Site AT 14C

A total of 33 potsherds was recovered from th structures at AT 14C, representing a minimum different pottery vessels. Several sherds have utiliz including a drill hole and pigment stains. Dates from about A.D. 1050 to 1300± (Table 12-22).

A redware bowl sherd with polished surfaces ha remnant of a drilled hole, probably for mending a cra vessel. A Socorro Black-on-white rim sherd has a br edge perpendicular to the rim, with striations paral the worked edge. A third worked sherd is a fragme a Socorro B/w bowl with abrasion opposite the rir

Site AT 15C

All of the 49 potsherds from this site were examine temper types and variations (Table 12-23). Thes cluded 15 Kiatuthlanna B/w and 12 Red Mesa sherds. Although the temper types are variable wi the assemblage, they are consistent with the prehis wares indigenous to the southern and southeastern Juan Basin, including Lobo Mesa, the eastern Red M Valley and the Grants or San Mateo areas. The ass blage ranges from about A.D. 850 to around A.D. 1 Two of the Red Mesa B/w sherds had been utilized on edge.

Two radiocarbon dates were obtained from the site, 575±135 and A.D. 835±190 (Bertram, this volume). dates appear to be earlier than the estimates based u associated pottery types, although the A.D. 835 seems to overlap with the earlier range of estimated d based upon previously established dating of the pot types.

Table 12-21. Pottery and Temper Classification of a Selected Sherd, AT 12C.

Pottery Type	Temper Definition and Description	Suggested Source
Casitas Red-on-brown	Sandstone temper, code 2051; clear quartz grains;also lt. orange, white, polished; fragment of a white snail shell, 2.0 mm; curved; clay lt. orange to medium gray; broadline red paint around inside and exterior of bowl.	Middle Rio Grande?

Table 12-22. Pottery From AT 14C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Puerco B/r	1000-1200	West Central NM	2		2
Socorro B/w	1050-1350	As above	9	7	16
Tularosa B/w	1100-1300	As above	1	1	
Mineral/white				3	3
Whiteware			1		1
Los Lunas Smudged	1175-1400	West Central NM	1		1
Kana'a Gray	500-1300	As above?		1	1
Tseh So Corrugated	900-1050±	As above?		2	2
Chaco Corrugated	1050-1300	As above?		1	1
Pitoche Banded	1050-1150	West Central NM		2	2
Pilares(?) Banded	1150-1275	As above			
Redware, polished		As above	1	1	
Brownware		As above	1		1
Brownware, smudged interior		As above		1	1
TOTALS			16	17	33

Table 12-23. Pottery From AT 15C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Kiatuthlanna B/w (late)	950-1250	Puerco River valley; Upper Little Colorado	11	3	14
Kiatuthlanna/Red Mesa B/w	As above	As above		1	1
Red Mesa B/w	850-1150	As above	3	5	8
Red Mesa B/w Cortez style	850-1150	Lobo Mesa, E. Red Mesa Valley; San Mateo-Acoma		4	4
Escavada B/w	950-1150±	Puerco River valley	1		1
Puerco B/w	1010-1125±	E. Red Mesa Valley		1	1
Mineral/white				3	3
Tohatchi Banded	900-1075±	As above		9	9
Tseh So Corrugated	900-1050	As above		2	2
Kana'a Gray	500-1300			5	5
Corona Corrugated	1225-1460			1	1
TOTALS			15	34	49

The site is located on the left bank of the Rio Puerco, a little less than two kilometers south of Interstate 40. The area is a grassland with sparse junipers on nearby ridges, and riparian growth along the floodplain. The use of old wood for building a fire could account for the difference in the age of the charcoal specimens and the estimated pottery type ranges.

Eight different sandstones and one kind of quartz mica schist were identified in the potsherds from the site. A brief description of the temper types is given in Table 12-24. In addition to sandstone and other rock, crushed sherd fragments are also usually present (Table 12-25).

It is not possible to determine the exact sources of manufacture of many of these sherds; those with sandstone tempers were identified by cross-referencing the characteristics of the temper with known sandstones in west-central and northwestern New Mexico. Research on known outcrops of temper materials has not been ca out in west-central New Mexico. Because sandstones have uniform characteristics over wide areas, some o assumptions made here will require future study testing.

The black-on-white wares of Pueblo II and early Pueb age of the Anasazi region of northwestern New Mexic typically tempered with a combination of crushed sl and rock. Sandstone is the main rock used in the south of Tohatchi and Crownpoint. Igneous rock commonly used in the northern part of the San J Basin, although sandstone was also used in the Juan area. Although sandstone temper may be n difficult to identify than igneous or metamorphic r temper, most of the sedimentary formations have cha teristics that can be described and recognized in potsherds. The source areas of the ceramics produ with sandstones will require more tedious examinatio

Table 12-24. Major Temper Types Occurring in Potsherds From AT 15C.

Lithic Code	Definition of Temper Varieties	Geographic Source
2040	Sandstone, fine-grained, subangular grains; ± sherd	Undifferentiated
2043- 2053 2083	Sandstone, Ceja Member (TSF); fine-grained to medium- and coarse-grained; subangular to rounded; varicolored grains; may have dipyramidal quartz crystals.	Rio Grande Valley
2092 2022	Sandstone: medium to coarse-grained; rounded quartz grains; ± fractures of magnetitic, hematitic, or white fine-grained sandstones; ± white clay pellets ca. 0.25 mm.; also angular fragments of white to gray sherd.	Puerco River Valley; Upper Little Colorac
2112	Sandstone, Morrison Formation (?); pink chalcedonic cement. Grains medium to coarse; icy white to lt. gray.	Red Mesa Valley
2113	Sandstone, Chinle Formation (?); quartz clear; rounded to subangular; crushed sherd, white to gray; feldspar clear to light gray; clay pellets or plates; ± hematite inclusions.	Red Mesa Valley; Upper Little Colorac
2125	Sandstone, Upper Cretaceous; fine-grained sandstone with white powdery cement; ± residual clay plates; occasionally limonitic, magnititic or hematitic cement, powdery.	As above
2140	Upper Cretaceous sandstones, without white cement; may have clay plate inclusions; also traces of black hornblende, in paste?	As above
2150	Gallup Sandstone, Upper Cretaceous; may have crystal overgrowths; occasional magnetite plate inclusions.	Puerco River Valley or Red Mesa Valley
4560	Quartz mica schist; silver, gold flakes of mica; ca. 3 mm.; smoky to milky subangular to subround quartz; light pink feldspar, 0.5 mm.	Rio Grande Valley axial gravel?

ıble 12-25. Pottery and Temper Classifications of Selected Sherds, AT 15C, Middle Rio Puerco.

Pottery Type	Temper Definition and Description	Suggested Source
Kiatuthlanna B/w bowl sherds	Code 2113, Chinle Sandstone(?) temper. Framed "squiggle" hachures; +sherd temper.	East Red Mesa Valley-San Mateo area
Kiatuthlanna B/w jar	As above.	As above
Kiatuthlanna B/w bowl	As above; framed hachures and solids.	As above
Kiatuthlanna B/w bowl	Code 2113; Chinle Sandstone temper(?); design interlocking scrolls; crushed sherd.	East Red Mesa Valley
Kiatuthlanna B/w bowl	Code 2113; Chinle Sandstone temper(?); tan clay; crushed sherd.	Upper Little Colorado?
Kiatuthlanna B/w bowl sherds	Code 2113; Chinle Sandstone temper(?); sherd; Solid designs framed with rickrack.	As above
Kiatuthlanna B/w jar sherd	Temper code 2150, Gallup sandstone; + sherd; Framed squiggle lines design.	Lobo Mesa
Kiatuthlanna B/w bowl rim	Temper 2140; + sherd; dotted triangles design.	San Juan Basin, SE
Kiatuthlanna B/w bowl sherds	Temper 2040; fine gr. sandstone, sherd. "Barbed wire" or ticked line design.	As above?
Kiatuthlanna B/w bowl, jar	Temper 2140 + iron cement, coarse sherd. Parallel squiggle line designs.	San Juan Basin SE
Kiatuthlanna B/w jar sherd	Temper 2150; Gallup Sandstone?, parallel squiggle lines design.	As above
Kiatuthlanna/ Red Mesa B/w jar sherd	Temper 2113, Chinle SE; nested chevrons.	Red Mesa Valley?
Red Mesa B/w jar rim	Temper code 2092, with iron oxide cement; dotted solids & scrolls.	Lobo Mesa; East San Juan Basin; Upper Rio Puerco
Red Mesa B/w jar sherd	Temper 2092, above; dotted solids, fine parallel line designs.	As above
Red Mesa B/w jar sherd	Temper code 2113, Chinle SS; dotted solid, fine-line designs; fritted clay; sherd temper.	E. Red Mesa Valley
Red Mesa B/w ?	Temper 2113; dotted solid designs & triangles, with framing lines; with sherd temper; edge abraded.	As above; or Acoma area
Red Mesa B/w jar sherd	Temper as above; dotted solid designs & lines. One edge abraded; plus sherd temper.	San Mateo/Acoma area Basin
Red Mesa B/w	Temper code 2113, Chinle Sandstone; plus sherd temper; solid geometric designs with fine framing lines; red-black paint	Acoma area?
Red Mesa B/w bowl sherd	Temper 2150 + crushed sherd; clay plates, dark brown paint; silver mica on surface; solid design	E. Red Mesa Valley

Table 12-25. Pottery and Temper Classifications of Selected Sherds, AT 15C, Middle Rio Puerco. (Continue

Pottery Type	Temper Definition and Description	Suggested Source
Red Mesa B/w? tiny sherd	Temper 2043; dark red paint; clay plates in paste	Rio Puerco Valley? or Upper Little Colora
Red Mesa B/w bowl sherd	Temper 2150 + crystal faces; solid geometric design; silver mica in paste	San Mateo area?
Red Mesa B/w	Temper 2150 & coarse sherd; designs dotted solids, ticked lines; hematite fragments in clay; red paint	S. San Juan Basin?
Escavada B/w bowl	Temper 2125; designs opposing sawteeth in red-brown mineral paint; silty clay; clay pellets	Rio Puerco Valley?
Puerco B/w jar sherd	Temper 2113; designs parallel lines; dark brown-black paint	East Red Mesa Valley
Mineral/white jar sherd	Temper as above; one black mineral paint line	Unknown
Mineral/gray jar sherds	Temper as above; dotted solid design (Red Mesa); abundant silver mica in slip	San Mateo area?
Corrugated Banded jar	Temper 2140; bands 6 to 9 mm; bands faintly indented;	N.W. New Mexico; Lobo Mesa(?)
Tohatchi Banded jar	Temper 2150; bands 11 to 12 mm; beveled at base of band	As above
Tohatchi Banded jar rim	Temper 2112, Morrison Fm. sandstone; light orange	E. San Juan Basin? or Red Mesa Valley
Tseh So Corrugated	Temper 2112, as above, wide indented scallops	As above
Tohatchi Banded	Temper as above; bands 11 mm wide; clay brown to black, weathers white	S.E. San Juan Basin
Corona Corrugated	Temper 2092, with red, black fine ss; hematite fragments	S.E. San Juan Basin; upper Rio Puerco Valle
Tohatchi Banded	Temper 2150; bands 14 mm, smooth edges	As above
Tohatchi Banded	Temper as above; similar to Pilares Banded, 5-6 mm	As above
Tohatchi Banded	As above, bands 8 mm; crystal overgrowths on quartz	As above
Tohatchi Banded	As above, bands 11-12 mm	As above
Tohatchi Banded	Temper 2113; bands 6-8 mm, incised lines & dots design on zig-zag across bands	As above
Tohatchi Banded	Temper 4560, mica schist; bands 8-9 mm	Rio Grande Valley?

potsherds from a number of sites through time and space. Not all clays are pottery clays, and these need to be tested by firing samples.

Among the Upper Cretaceous clays of the San Juan Basin and the Upper Little Colorado, not all the clays are completely plastic; small pellets or plates of clay remained in vessel walls, possibly serving as temper clay pellets or plates did not have the carbon drive and appear as black inclusions in the pottery. black inclusions have occasionally been mistake fragments of basalt.

able 12-26. Pottery From AT 17C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Socorro B/w	1050-1350	West Central NM		2	2
Brownware, polished	500-1400?	Middle Rio Grande		1	1
TOTALS				3	3

he utility wares were usually tempered with coarse-rained sandstones, but in the Upper Little Colorado rea, crushed sherd, often white, was frequently used in ie production of cooking pots.

ite AT 17C

nly three potsherds were found at this site, all dating etween A.D. 900 and 1350 (Table 12-26). In combina-on, however, the sherds may range from A.D. 1050 to 350.

ne polished brownware sherd cannot be named by ottery type. However, the sherd is tempered with coarse agments of mica schist, suggesting a production source ither in the Tijeras Canyon or Manzano Mountains. A iird source for white mica schist is in the Ladron lountains. Micaceous schist can also be found in the lo Grande Valley gravel deposits.

ite AT 18C

his site consisted of a sparse scatter of sherds and flakes t two locations; five potsherds were collected and ana-yzed (Table 12-27). A date range of A.D. 1250 to 1350 is uggested.

One jar sherd of a Socorro Black-on-white vessel was examined in detail for temper type. Its design is a classic Reserve Black-on-white style with opposing solid motifs and framed hatching. The paint is dark reddish brown mineral on a glossy surface, and has the very fine crazing that is characteristic of this pottery type. This Socorro B/w jar sherd had been utilized on one edge; the striations are nearly perpendicular to the sherd wall. It was tempered with crushed sherd and hornblende latite of the Datil Volcanics. Clear quartz (0.25 mm in size), traces of vitreous feldspar, and minute black hornblende prisms are characteristic of the temper of west-central New Mexico.

Socorro B/w is characterized by fine workmanship, including walls which are consistently of equal thickness throughout the vessel, well-executed designs, and fine-grained temper fragments. Although temper types of Socorro B/w vary, as do those of most prehistoric vessels, the fragments are usually always finely ground. The paste of the Socorro B/w jar sherd is very light gray, finely-granular, and compact with a conchoidal fracture and medium gray core.

Residual clay plates are present in this Socorro B/w sherd. These are probably residual fragments of platy Cretaceous clay and are not more than one millimeter long.

able 12-27. Pottery From AT 18C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Socorro B/w	1050-1300	Upper Rio Salado		1	1
Santa Fe B/w	1225-1350	Middle Rio Grande (?)	1		1
Galisteo B/w	1250-1350	As above(?)	1		1
Mineral/white	Unknown	Unknown		1	1
Whiteware	1050-1350?	Crushed sherd, igneous? (Datil volcanics, latite)		1	1
TOTALS			2	3	5

Table 12-28. Pottery From AT 19C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Tota
Santa Fe B/w	1225-1350±	Central Rio Grande Valley		1	1
Whiteware (Santa Fe B/w?)		As above		1	1
Corona? Corrugated (micaceous)	1225-1460	Tijeras Canyon; Manzano Mountains		1	1
Rio Grande Micaceous	1300-1700	As above; also Rio Grande Valley		1	1
TOTALS			0	4	4

It has been estimated that Socorro B/w was produced in west-central New Mexico between A.D. 1050 and 1350 (Breternitz 1966).

Site AT 19C

Two of the four potsherds from AT 19C are utility wares with mica schist temper, from either Tijeras Canyon or the Manzano Mountains. Two whiteware sherds include one decorated Santa Fe Black-on-white jar sherd and one plain whiteware piece, with temper similar to the Santa Fe sherd (Table 12-28).

The four sherds appear to belong to one period of occupation at AT 19C, dating within the period of A.D. 1225 to about 1350.

Site AT 21C

Thirteen potsherds were collected at AT 21C, only one of which was a decorated sherd (Table 12-29). The one jar sherd of Socorro Black-on-white is the only decorated sherd at the site. Five sherds of Tohatchi Bande seven sherds of grayware utility indicate that the collected a minimum of three vessels from this These have a date range from A.D. 900 to at least

The one jar sherd of Socorro Black-on-white is tem with hornblende latite from the Datil volcanics of central New Mexico, indicating production in that

Four sherds of Tohatchi Banded were tempered witl coarse fragments of crushed sherd, similar to the of the vessel. Aplastic fragments of dark gray particles or plates are present and sparse subrou quartz grains, clear to light gray, were also noted.

One grayware utility sherd contained temper fragn of fine-grained magnetitic sandstone; poorly sorted s stone; fine-grained limonitic sandstone; fine-gra hematitic sandstone; subangular, clear, coarse-gra quartz; and fragments of light gray chert(?). T temper types appear to be from the Cretaceous s stone of the Upper Rio Salado, west-central New Me possibly south of Tres Hermanas Mesa.

Table 12-29. Pottery From AT 21C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Socorro B/w	1050-1175	West Central NM		1	1
Tohatchi Banded	900-1075	As above, or Upper Little Colorado		5	5
Grayware, utility		West Central NM		7	7
TOTALS			0	13	13

Table 12-30. Pottery From AT 24C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Lino Red	500-660±	Upper Rio Puerco; Rio San Jose; Rio Salado(?)		1	1
Mineral/white	(?)	As above?		2	2
Lino Gray	500-875	As above		19	19
TOTALS			0	22	22

Site AT 22C

This site had a sparse scatter of flakes and one sherd of La Plata Black-on-red. This red-bowl rim was tempered with hornblende diorite, characteristic of the redwares of the San Juan region or the Four Corners area.

The date for the La Plata B/r sherd is A.D. 800 to 1000. La Plata Black-on-red was a widely distributed pottery type in the Southwest.

Site AT 24C

This site is located approximately one mile north of Interstate 40. Most of the potsherds are from jar forms and have white paste and sandstone temper; the probable source is the Upper Rio Salado drainage. However, white-firing clays of Upper Cretaceous sediments are available north and west of the site, so that local production of pottery is possible. White-firing clays occur in the upper reaches of the Rio Puerco and along the Rio San Jose as well (Mera 1935). One Lino Red jar sherd was collected at the site (Table 12-30).

Three of the sherds from the site were examined for temper materials; all appear to have been produced from white-firing clays, probably obtained from outcrops of Upper Cretaceous sediments.

The one Lino Red sherd has a white, hackly paste with irregular fractures and flecks of silvery mica. The temper includes coarse-grained, clear to light gray quartz, usually subangular with some edge rounding. The slip is earthy red (grayish red: 5YR4/2) and is weathered.

Lino Red was first named and described by Wendorf (1954) as a red-slipped Lino Gray. The same or similar ware was later named "Tallohogan Red" by Daifuku (1961). Lino Red is basically synonymous with "Woodruff Red" as well, a Basketmaker type first described by Haury in 1940. The latter is described as having fine-grained sandstone temper, however.

Lino Red sherds occurred at Chaco Canyon, where the Basketmaker III period was roughly dated between A.D. 400 to 500 and about A.D. 725 to 750 (Hayes 1981).

Table 12-31. Pottery From AT 25C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Kiatuthlanna B/w (early)	500-750	Upper Rio Salado (?)	2		2
Mineral/white	Unknown			1	1
Whiteware	Unknown			2	2
Lino Gray	500-875	Rio Grande Valley		25	25
TOTALS			2	28	30

One Lino Gray sherd has white-firing clay with silvery mica in the matrix. Temper grains include rounded and polished grains of quartz; white chatoyant feldspar; red-brown hematite fragments; chalcedony with yellow mossy inclusions; and siltstone fragments with white cement and with red cement. The manufacturing source may be along the Rio Salado drainage.

Another Lino Gray sherd from AT 24C is from a closed form with a neck, and has white-firing clay. Temper grains include coarse sand; clear quartz; vitreous, clear feldspar; light-red to gray welded tuff matrix; hematite fragments; and black and gray perlitic glass fragments. These inclusions suggest an origin along the Rio Salado in west-central New Mexico, where both white-firing clays and hematitic sandstones are available.

Site AT 25C

The sherds from this site are all of the Basketmaker III period of the Pecos Classification (Kidder 1927), with estimated dates from A.D. 500 to 600+. Twenty-five of the 30 sherds are Lino Gray with sandstone temper (Table 12-31). Six of the sherds were examined in detail for temper.

The six sherds examined for temper from the site all had white-firing clays, indicating production in the vicinity of outcrops of Upper Cretaceous clays, but close to outcrops of volcanic rocks and sandstones used for temper.

The main difference among the Basketmaker decorated wares appears to be surface finish, which is polished and smooth if the clay shrinkage is low, but rough and uneven if the clay shrinkage is high. Clays with high shrinkage will leave coarse temper grains protruding on polished surfaces. In addition, the finer the grain size, the easier it is to achieve and maintain a polished surface.

The decorated and utility wares are generally produced with white-firing clays, however, one of the four Lino Gray sherds fired light brown or brownish-red, probably d to the iron content in the clay.

In general, Basketmaker III pottery of the Cibola area in the past been dated about A.D. 500 to 750, or late 1981, Hayes suggested dates at Chaco Canyon fror 400s, based upon revised tree-ring dates.

Four of the Lino Gray sherds from AT 25C were anal for temper. They are from closed forms. The temp from a coarse-grained, friable sandstone with gr ranging from 1.0 to 2.0 mm, probably from uncon dated volcanic sediments. Quartz grains are smoky clear, high-temperature crystals. Sandstone fragm have hematitic cement. Grains of chalcedony inc mossy red-orange, gray, light gray and dark-brown qu Crystals of light-orange feldspar may be present. B volcanic glass, as well as perlitic and light-gray bar obsidian, may be present. The paste is white, stri dull and well-indurated, with colors ranging from bu light red.

A bowl sherd of Kiatuthlanna Black-on-white has f ments of limonitic sandstone and includes cl subangular quartz grains. The paste is white, granular and slightly vuggy. The paint is limonitic, li to yellow-brown. Motifs consist of parallel lines yellow-brown limonitic paint. The probable source o original vessel is west-central New Mexico.

Another bowl sherd with black, thick, crazed paint c be classed as Kiatuthlanna B/w or La Plata B/w, acc ing to the design of fine parallel lines and solid triang motif. The temper consists of a light gray vitrophyre black specks, obsidian fragments, high tempera quartz and vitreous and clear feldspar. The matrix o vitrophyre ranges to black glass. The past is white, de and has an even fracture; the walls are about millimeters thick. The slip has pearly mica flakes on exterior of the bowl only. The paint is thick, black crazed. The source area is most likely west-central Mexico.

Table 12-32. Pottery From AT 28C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Mineral/white	500-875	Undetermined	1		1
Lino Gray	500-875	Rio Salado Valley		2	2
Brown, Undiff.	500-875+	As above?		2	2
TOTALS			1	4	5

Table 12-33. Pottery From AT 29C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Klatuthlanna B/w (late)	950-1250	West Central NM	2	6	8
Red Mesa B/w	850-1150	As above		1	1
Mineral/white	?		2	11	13
Tohatchi Banded	900-1075	As above		25	25
Whiteware, plain			2	2	4
Unidentified			1		1
TOTALS			7	45	52

Site AT 26C

The three sherds found at this site appear to be from a Casitas Red bowl, which was tempered with fine-grained sandstone of the Ceja Member of the Santa Fe Formation.

Site AT 28C

This site was a small ceramic and lithic scatter located on the right (west) bank of the Rio Puerco, about two kilometers northwest of the Rio Puerco Trading Post. The suggested date range is from A.D. 500 to 875±. Lino Gray is the only identified pottery type (Table 12-32).

Three of the five sherds from this site were examined for temper, including two Lino Gray sherds and one unidentified brownware sherd.

The two Lino Gray sherds were tempered with coarse grains of vitreous quartz with occasional pink, light gray and light orange quartz grains; plus white chatoyant feldspar and pink and gray shades of feldspar; ferruginous grains; and light-orange chalcedony grains.

A brownware sherd from a closed vessel form has a smoothed exterior. The past is dark reddish brown (5YR3/2) with light-red weathered surfaces (5YR6/4). The temper consists of fine grains of sand and sandstone fractures, with hematitic grains as above.

The combinations of temper and paste suggest production in the area of outcrops of volcanic clays, probably along the Rio Salado. The temper grains may be from the rhyolites of the Datil Formation of west-central New Mexico.

Site AT 29C

AT 29C is located about one mile northwest of the Rio Puerco Trading Post. Fifty-two sherds from decorated and utility wares were recovered from the site area (Table 12-33). These sherds indicate that the site was occupied some time between A.D. 850 and 1150, or later. Klatuthlanna B/w (late), one sherd of Red Mesa B/w, and 25 sherds of Tohatchi Banded indicate intrusives from west-central New Mexico.

Ten sherds of Klatuthlanna and Tohatchi Banded, and one bowl sherd that may be considered La Plata B/w or Klatuthlanna B/w, were studied. The one bowl sherd has coarse-grained sandstone temper, and could be considered La Plata B/w on the basis of the temper grain size. However, there is no specific dividing line for the grain size of the two pottery types. The bowl sherd in question contains fragments of Gallup Sandstone (2150), with limonite and hematite fragments. This temper is common in the upper Little Colorado and Rio Salado areas.

One sherd of Klatuthlanna B/w was tempered with crushed sherd similar to its clay paste; fine-grained, subangular quartz, and vitreous to icy feldspar rhombs; and aplastic clay plates of gray to black colors which were probably residual clay particles. The sherd is a bowl rim.

Five other Klatuthlanna B/w potsherds are similar in temper to the above specimen. Designs include fine-line chevrons, and fine-line and triangle solids in dark brown, limonitic, fugitive paint. The clay paste has flecks of silvery mica, probably of Upper Cretaceous sediments. Residual aplastic plates of clay occur in the five sherds.

Table 12-34. Pottery From AT 31C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
San Marcial B/w	500-875?	West Central NM	11	7	18
Lino Polished	500-650	As above		1	1
Lino Smudged	500-650	As above		28	28
Lino Red	500-660±	As above		1	1
Lino Gray	500-875	As above	5	146	151
Brown Smudged	?	As above		2	2
Alma Washboard	500-1300	As above		1	1
Redware, polished	500-660±	As above		2	2
Whiteware	As above	As above		2?	2
Plainware	As above	As above		8	8
Socorro B/w	1050-1350	As above		3	3
TOTALS			16	201	217

Two Tohatchi Banded jar sherds are tempered with quartz grains that may have crystal faces. These grains are very coarse, clear, smoky, and white, with earthy fragments of hematite. Residual dark-gray clay plates are present in the clay; the paste is white-firing with medium cores.

One Tohatchi Banded jar sherd has temper as above plus light gray to icy feldspar grains and caliche fragments. The bands are smeared, and are about ten millimeters wide.

Site AT 31C

All the sherds from this site appear to belong to the Basketmaker III period, except for three sherds of Socorro B/w (Table 12-34). Temper and paste characteristics suggest that the vessels were produced in west-central New Mexico, probably within the Rio Salado and Alamocito Creek drainage systems, and northward to Acoma and the San Mateo region (Table 12-35).

A radiocarbon date obtained at the site provides one of the earliest dates for the Basketmaker III period in the middle Rio Grande area: A.D. 500±113 (Bertram, this volume). The date appears to be consistent with dates reported in the Mogollon area ranging from about A.D. 200 to around A.D. 400 (LeBlanc 1980).

As yet, there has been little evidence of production of Basketmaker III pottery in the Rio Puerco valley, although extensive outcrops of Upper Cretaceous s ments are present to the west of the Puerco.

In general, white-firing clays crop out in west-cer New Mexico along the southern perimeter of the Juan Basin. The main localities include the area sc of Zuni, the Red Mesa Valley, the Acoma and Cebol areas, and the Rio Salado and the upper Little Colo basins.

Mera (1935) reported extensive distributions of Lino C and associated wares along the Rio Puerco and San drainages. San Marcial B/w pottery has been foun far south as Elephant Butte lake and at least as far n as Nambe Pueblo.

There are numerous problems relating to classifica within the prehistoric whitewares of the Cibola bra that need resolution, although it is not within the sc of this report to deal with those problems. In 1958, Cibola White Ware Conference considered San Mar Black-on-white to be a variety of White Mound Black white, although San Marcial was first named and descr by Mera (1935). It is possible that all the Basketmak potsherds at AT 31C may be intrusive to the Rio Pu Valley. However, temper analysis in Table 12-35 c suggest that much of the pottery was produced in w central New Mexico. On the other hand, no exten study of temper types in either west-central New Me or along the Rio Grande has yet been undertaken.

Table 12-35. Pottery and Temper Classifications of Selected Sherds, AT 31C.

Pottery Type	Temper Definition and Description	Suggested Source
Alma Washboard jar sherd	Temper: hornblende latite of the Datil volcanics well polished on interior and exterior; buff surface; paste is light red to dark gray interior; undulations or "washboard" 6 to 7.5 mm.	West-central NM: Rio Salado drainage
Lino Gray jar	Sandstone temper, fine, rounded, colored grains (code 2043); ovoid white clay pellets; vitreous feldspar, black hornblende; magnetite granules Clay: white with gray core	Upper Little Colorado; west central New Mexico
Lino Gray jar	Temper: clear and colored subangular quartz grains (code 2052); sandstone fracture, 2 mm; quartz, round; aplastic black to white clay plates; Clay: light to dark gray.	West central New Mexico? (or Upper Rio Puerco)?
Lino Gray jar	Temper: very coarse grains of quartz, icy feldspar, chalcedony; ironstone grains; white clay paste	As above
Lino Gray jar	Temper: coarse and fine grains of lt. gray quartz; sandstone fractures; lt. gray clay plates; paste is white, cream	As above
Lino Gray jar	Temper: as above + rounded, colored quartz; also limonite fragments; Spec. #289.1 has an exterior slip of fine grains of quartz. White paste, gray core	As above
Lino Gray jar	Temper: medium grains of quartz, clear and colored; subrounded. White clay paste, lt. gray core. Aplastic clay plates	As above
Lino Gray jar	Temper: very coarse, smoky quartz grains, white feldspar (Code 2150); paste dark brown; surface weathers white; vessel smoothed	As above?
Lino Gray	Temper: coarse clear quartz, icy white feldspar; fine-grained hematitic sandstone fractures.	As above
Lino Gray	Temper: quartz grains, clear, colorless, rounded. Clay white to dark gray, with aplastic black clay plates	West central New Mexico?
Lino Red jar	Temper: coarse grained quartz, fractures of fine-grained hematitic sandstone: slip dark red; paste, light orange	As above? or Upper Rio Puerco (?)
Redware jar	Temper: hornblende latite (Datil Fm?), and quartz grains, fine; polished red surfaces	As above
Lino Smudged jar	Temper: fine-grained sand grains abundant. Paste white to very light gray; polished, smudged surface	As above
Lino Smudged jar	Temper: coarse quartz and fractures of white, fine-grained sandstone; paste white to yellow brown; exterior surface smoothed, slight polish	As above
San Marcial B/w bowl rim	Temper: hornblende latite (Datil Fm?); abundant white clay plates; white to medium gray paste; paint black, rim black	As above

Table 12-35. Pottery and Temper Classifications of Selected Sherds, AT 31C. (Continued)

Pottery Type	Temper Definition and Description	Suggested Source
San Marcial B/w (?) jar sherd	Temper: coarse quartz grains, colored; earthy hematite fragments; clay plates; solid design; polished surface; black mineral paint; paste lt. to medium gray; no slip	As above
San Marcial B/w jar	Temper: hornblende latite grains; solid red-brown paint; surface polished; paste light gray	As above
San Marcial B/w bowl	Temper: hornblende latite grains; clay plates; red-black paint, heavy parallel lines; vitreous lt. red and lt. gray latite fragments?	As above
San Marcial B/w bowl	Temper: quartz grains, clear and colors; clay plates; + hematite fragments; paste lt. to dark gray; paint dark red-brown; design cross-hatching	As above
San Marcial B/w bowl	Temper: fine grained quartz grains; clay plates. Paste white, hackly. Paint red-brown, medium line geometric.	West central New Mexico
San Marcial B/w jar	Temper: hornblende latite (Datil Fm.); abundant white clay plates; dark brown mineral paint. Paste, white, hackly.	As above
San Marcial B/w jar sherds	Temper: fine grained quartz grains; clay plates; high temperature quartz. Paste is white; designs in black mineral paint, chevrons framing solids.	As above
Socorro B/w jar sherds	Temper: hornblende latite minerals + caliche fragments. Paste light medium-gray, blocky; paint dark brown-black; design Reserve style	As above
Lino Gray Neckbanded jar	Temper: sand grains, medium; high quartz, icy feldspar; abundant clay plates; white clay with brown core. Neck bands, circa 8 mm, smeared and nearly obliterated.	As above

Table 12-36. Pottery From AT 32C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Red Mesa B/w	850-1150	Red Mesa Valley or San Mateo	6	10	16
Kiatuthlanna B/w	950-1250	As above		2	2
Tohatchi Banded	900-1075	As above		11	11
Mineral/white			2	7	9
Brownware, polished			1		1
Plainware, undifferentiated			2	1	3
TOTALS			11	31	42

Table 12-37. Pottery From AT 37C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Lino Gray	500-875?	Rio Salado; Rio Puerco	2	13	15
Plainware	?	Unknown		2	2
Redware (?)	500-660±	Rio San Jose or upper Rio Puerco	1		1
TOTALS			3	15	18

Table 12-38. Pottery and Temper Classification of Selected Sherds, AT 37C.

Pottery Type	Temper Definition and Description	Suggested Source
Lino Gray Jar	Temper consists of coarse-grained, rounded, polished grains ± dipyramidal crystals; light gray quartz; fine-grained sandstone fractures with red hematitic cement; feldspar crystals are chatoyant clear to pale blue; traces of black hornblende prisms. The paste is cream-colored; very coarse clay plates to 7 mm are present.	The Rio Salado
Lino Gray Jar	Temper is similar to above; paste is white; the core is gray.	
Lino Gray Jar (?)	The temper is similar to Spec. 1.1; the sherd appears to have a light reddish orange slip on the exterior; the interior of the sherd is smoothed.	

Table 12-39. Pottery From AT 38C.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Kiatuthlanna B/w	950-1250	Acoma & San Mateo areas?	4	3	7
Red Mesa B/w	850-1150	As above		11	11
Escavada B/w	950-1150	As above		6	6
Cortez B/w	900-1000	Unknown		1	1
Puerco B/w	1010-1125	Acoma or San Mateo		7	7
Gallup B/w (early)	950-1150	As above	5	26	31
Whiteware	?	?	9	46	55
Mineral/white	?	?	14	5	19
Mesa Verde B/w(?)	?	?		2	2
Chaco Corrugated	1050-1300	?		150	150
Pitoche Banded	1050-1150	Rio Salado Area		3	3
Corrugated Indented	900-1075	?		3	3
Kana'a Gray	500-1300	?		9	9
Washboard, jar	As above	?		1	1
Plain, undifferentiated		?	5	48	53
TOTALS			37	321	358

Table 12-40. Pottery and Temper Classifications of Selected Potsherds, AT 38C.

Pottery Type	Temper Type and Description	Suggested Source
Kiatuthlanna B/w bowl rim	Temper: Crushed white sherd in white paste; sparse fine grains of clear quartz; yellow brown mineral paint.	Unknown
Kiatuthlanna B/w bowl	Temper: Crushed sherd, lt. gray, same as paste; fine grains of quartz, clear; paste lt. gray, blocky; silver mica in slip; black mineral paint.	Acoma area?
Kiatuthlanna B/w jar sherd	Temper: Crushed lt. gray sherd; quartz, medium grained, clear, limonite fragments; silver mica in slip; black mineral paint.	
Kiatuthlanna B/w bowl	Temper: Very fine-grained quartz; paste is white with lt. brown core.	Rio Salado(?)
Kiatuthlanna B/w bowl	Temper: Crushed white sherd and fractures of fine grained white sandstone; black mineral paint; one edge abraded.	
Escavada B/w jar sherds	Temper: Crushed sherd, angular gray; white, fine-grained sandstone fractures; iron oxide fragments; incised saw mark on edge of spec. 17.3	Rio Salado(?)
Gallup B/w (early?) 1 jar; 2 bowl sherds	Temper: Crushed sherd, white, 1 mm or less; fine-grained white sandstone fractures; aplastic clay plates; paste white to dark gray.	San Mateo region(
Gallup B/w (early?) jar	Temper: Crushed white sherd temper, 1 mm or less; sparse quartz, fine grained; 0.25 mm; mineral paint; white to medium gray paste.	
Gallup B/w (early) jar sherds	Temper: Crushed white sherd, gray; white fine-grained sandstone fractures; iron oxide fragments; silver mica in slip; mineral paint.	
Gallup B/w (early?) jar	Temper: Crushed white sherd; 0.25 mm; quartz, fine-grained; paste white; black mineral paint.	San Mateo area(?)
Puerco B/w jar	Temper: Crushed sherd, white; white micaceous slip; lt. brown hackly paste.	
Puerco B/w jar	Temper: Crushed sherd; fractures of fine-grained white sandstone; limonite fragments; paste light gray to buff.	Upper Rio Salado?
Mesa Verde B/w jar	Temper: Very fine-grained sandstone (UpperCretaceous): and finely crushed sherd temper; gray clay plates in light gray paste; surface highly polished; carbon paint.	Upper Rio Puerco?
Chaco Corrugated Oblique Indented jar	Temper: Quartz, very coarse, subanuglar, clearto smoky or milky, 2-4 mm grains; ± gray feldspar; fine-grained sandstone fractures with white cement; aplastic clay plates, dark gray to 4 mm. Paste lt. gray (N7); well-indurated with sparse silver mica inclusion; bands 3-5 mm.	
Chaco Corrugated Oblique Indented jar, one lug	Temper: Quartz, very coarse, gray, clear; highquartz crystals; sandstone fragments with red, black, white cement; feldspar, lt. gray, chatoyant; ironstone grains, red, black; clay plates.	probably the Rio Salado.
Chaco Corrugated jar	Temper: Morrison Sandstone (2113) with pink chalcedonic cement; quartz rounded to subangular; clear to smoky; 1-2 mm; feldspar is icy gray, twinned and chatoyant; light light gray polished chert grains; the clay is very light gray and hackly.	Red Mesa Valley
Tohatchi Banded jar	Temper: Crushed sherd, white; quartz grains, medium; rounded, clear to light smoky; feldspar clear, fine to medium grains. Paste weathers white on surface; core is lt. brown to light gray; wide banding (14 mm); slightly scalloped.	

Table 12-41. Pottery Types of Atrisco Isolated Finds, Elena Gallegos Project (North to South).

Pottery Type	Form	Dates A.D.	Sources of Pottery Types and Temper
Los Lunas Smudged	Bowl	1175-1400	West Central NM; temper Hornblende Latite
Grayware? (2 sherds)	jar		Middle Rio Grande?; temper volcanic sandstone
Chaco Corrugated	jar	1050-1300	As above; temper 2083; Ceja sandstone temper
Lino Gray	jar	500-875	As above; temper 2475, volcanic sandstone
Gallup B/w?	bowl	1000-1125	West Central NM; Temper sherd & quartz (0103-68)
Whiteware	jar		West Central NM; Temper sherd + coarse quartz
Whiteware, polished	jar		As above; sandstone temper, med. grained (2051)
Grayware, BM III?	jar?		Middle Rio Grande; temper coarse sandstone (2083)
Whiteware, polished	jar		As above; sandstone temper (2080-52)
Grayware	jar		As above; sandstone temper (2080-59)
Grayware	jar		As above; coarse sandstone temper (2080-70)
Socorro B/w? (3 sherds)	bowl	1050-1350	West central New Mexico; sherd + clay pellets for temper
Socorro B/w	jar	1050-1350	West central NM; hornblende latite temper (3267-02)
Socorro B/w	jar	1050-1350	West central NM; sandstone and sherd temper
Socorro B/w	bowl	1050-1350	As above; hornblende latite temper
Mineral/white	bowl		As above; fine-grained sandstone & sherd temper

Site AT 32C

Of a total of 36 potsherds, only 24 sherds from AT 32C could be identified by type. Three types were identified including Kiatuthlanna B/w, Red Mesa B/w, and Tohatchi Banded (Table 12-36). The time frame ranges from A.D. 850 to 1250, with an estimated date for the site between A.D. 850 and 1075. The pottery types could have come from almost anywhere in the Red Mesa Valley or Cibola area.

Site AT 34C

Only two whiteware bowl sherds were recovered from this site. One sherd was tempered with volcanic sandstone (code 2477), including rounded, colored quartz grains and grains of high quartz. The source of the sandstone may be the Bandelier Tuff sediments. The second sherd was tempered with fragments of granitic or intermediate grains of an intermediate igneous rock containing feldspar, gold-colored mica and pyroxene crystals. Both of these temper types appear to be of local origin in the Rio Puerco or Rio Grande areas.

Site AT 37C

This site is located about one mile south of the Rio Puerco Trading Post and consists of a thin scatter of potsherds, lithic debris, and ground stone. The potsherds recovered indicate a Basketmaker period occupation (Table 12-37).

Table 12-42. Lithic Analysis Codes, Atrisco Survey Area.

Code	Classification and Description	Source
1010	Chert, fossiliferous, undifferentiated	Not determined
1011	Chert, fossiliferous; conchoidal fracture; luster waxy to dull; colors range from cream to light red; has inclusions of small circular or crescentic fossils, often of tiny vitreous, colorless quartz crystals, 0.5 to 5.0 mm in diam; occurs cobbles with abundant percussion marks.	In gravel of Santa Fe Fm. along the Rio Puerco and Rio Grande; In gravel of the Nacimiento, Ojo Alamo formations; San Juan River terrace gravel.
1016	Chert, fossiliferous. Gray, tan, banded	San Andres formation, Zuni Mts., Sacramento Mts., etc.
1030	Chert, black, undifferentiated.	In upper Santa Fe Fm gravel, as polished pebbles, west of Rio Puerco.
1035	Chert, black, banded; dull luster	Probably from Mancos Shale
1046	Chert, green, undifferentiated	
1050	Chert, white	Nearest source to LA 13669 1051 is gravel
1051	Chert, white with black dendritic inclusions	of the Santa Fe 1052 Fm, west and east of
1052	Chalcedony, clear, colorless to light yellow	Rio Puerco; also found in Rio Grande Valley
1053	Chalcedony, clear with black inclusions	in Santa Fe Fm; and as lag gravel on high surfaces flanking the Jemez Mts., possibly same age as Pedernal Chert. The following cherts and chalcedony are gradational from one to another, and are probably all the same source: 1050-1053, 1098, 1099, 1214, 1215.
1054	Chalcedony, includes 1050-53, 1214, 1215, 1098 and 1099	High surface gravel, Santa Fe Fm.
1060	Chert, red jasper	Santa Fe Fm. gravel, at site
1070	Chert, yellow-brown jasper	Santa Fe Fm. gravel, at site
1072	Chert, yellow brown, brown jasper with black mossy inclusions, grades to red	
1073	Chert, yellow brown with olive brown chalcedony inclusions	Cochiti, Zia area
1075	Chert, dark brown, misc.	
1110	Silicified wood, dark colors, dull luster Correo	Santa Fe Fm; also Chinle Fm. (Triassic) near
1111	Silicified wood, dark colors, vascular rays	Nacimiento Fm., San JuanBasin
1112	Silicified wood, brown, gray, waxy luster, conchoidal fracture	Santa Fe Fm. gravel, local
1113	Silicified wood, light colors, variegated, waxy luster; conchoidal fracture	As above
1140	Silicified wood, light colors, white, chalcedonic, undifferentiated (one color)	
1150	Silicified wood, yellow brown, jasper	As above, probably; also common in San Juan Basin

able 12-42. Lithic Analysis Codes, Atrisco Survey Area. (Continued)

Code	Classification and Description	Source
1221	Chalcedony, clear abundant yellow mossy inclusions (moss jasper) misc.	
1230	Chalcedony, clear with sparse red inclusions, misc.	
1231	Chalcedony, clear with abundant red inclusions (moss jasper), misc.	
1392	Opal, lt. gray to brown, banded; nodules in vitric tuff.	La Mesita Negra, New Mexico
1436	Chert, subsumes 1430, 1431 and 1432. Morrison "agate"	
1503	Porcellanite, slabby vitric tuff, cherty	Rio Puerco corral, H. Gray, vitric tuff
1600	Chert, light gray, undifferentiated	Undetermined
1615	Chert, dark gray with red inclusions, misc.	
1632	Chert, cream colored, green tints; red-brown core	Placitas, New Mexico
1640	Chert, light orange	
1660	Chert, light tan or buff	
2000	Sandstone, undifferentiated	
2010	Sandstone, fine grained, indurated, massive, undiff.	
2015	Sandstone, very fine grained (less than 0.125), undiff.	
2070	Sandstone, medium to coarse grained, indurated, cobbles, undiff.	
2091	Sandstone, limonitic, undiff.	
2112	Sandstone, coarse grained, pink, with chalcedonic cement; Prewitt Mb.	Morrison Fm., Prewitt area
2113	Sandstone, Chinle ss	
2122	Sandstone, Flagstone (red) Triassic rocks	
2200	Quartzitic sandstone, misc.	
2205	Quartzitic sandstone, white-buff, orange to red, fine grained, even conchoidal fracture	NE New Mexico, Morrison Fm.
2220	Quartzitic sandstone, coarse grained, red, high gravel	Chaco area
2221	Quartzitic sandstone, high surface gravel mottled gray-tan	San Juan Basin
2250	Siltstone, undifferentiated	
2252	Siltstone, mudstone, sandstone, white, pink, thin slabby	
2600	Mudstone	Santa Fe Fm. gravel, local

Table 12-42. Lithic Analysis Codes, Atrisco Survey Area. (Continued)

Code	Classification and Description	Source
2700	Limestone, undifferentiated	
2770	Caliche	
2911	Concretions, limonitic, sandy	
2912	Concretion, hematitic, or ironstone, usually sandy	
3001	Aplite, light colored, fine grained, sugary textured igneous rock	
3010	Felsite, aphanitic (rhyolite); light colored volcanic rock	
3030	Intermediate and Syenitic rocks, aphanitic (trachyte) Felsophyre	
3035	Intermediate and Syenitic rocks, felsophyre	
3036	Intermediate igneous, felsophyre and hb	
3070	Porphyry, granitic	
3075	Porphyry, intermediate, felsic	
3266	Latite, hornblende, undiff.	
3401	Basalt, finely crystalline, platy	
3431	Basalt, scoria, reddish gray, low density	Cochiti area (temper)
3451	Basalt, olivine, vesicular	
3520	Obsidian, Jemez Mts., clear with brown tinges; undifferentiated	Jemez Mts.
3527	Obsidian, clear, gray or brown streaks and mossy inclusions with fine white specks	
3652	Perlite (welded pumice), white, etc.	Peralta Canyon; Jemez
3700	Vitrophyre, black, dense, glassy ground mass, conchoidal fracture	Various sources, including Jemez Mts., Grants area
3730	Vitrophyre, rhyolitic, red, grays, purples, etc.; glassy welded	Canoncito Reservation Rio Puerco (outcrop Zia Fm.)
3740	Vitrophyre, intermediate, glassy	
4000	Quartzite, undifferentiated	
4005	Quartzite, misc. cobbles	
4006	Quartzite, pebble	
4510	Schist, hornblende (schistose)	
5011	Quartz (rock); milky; polished pebbles, vitreous luster on fresh break, uneven fracture	Upper Morrison Fm., Canada Ojo, near Mesa Cocina

Two jar sherds and one bowl sherd of Lino Gray were recovered from this site. All three had similar temper including fractures of fine-grained hematitic sandstone (Table 12-38). The suggested source of the pottery is the Rio Salado valley, although pottery from the Rio Puerco is also a possibility as little is known of the temper of that area. Since none of the earlier polished pottery is present at AT 37C, the sherds may date to the A.D. 800s.

Site AT 38C

A minimum of 21 vessels was represented by a total of 360 sherds at this site, which is located approximately one mile south of Cerro Colorado and two miles southeast of the Rio Puerco Trading Post. The pottery types range in time from approximately A.D. 850 to about 1150 (Table 12-39). At least 20 variations of temper are present, and appear to be mainly from the general Acoma region (Table 12-40).

The suggested source areas of the pots represented by the potsherds found at this site are in most cases best guesses. When the initial examination of the pottery from the Atrisco sites was made, few data were available from archeological sites in the upper Rio Puerco Valley, such as the Guadalupe Ruin to the north. Fortunately, it has been possible to examine some sherds from the Rio Salado in west-central New Mexico. In particular, an attempt was made to determine the sources of pottery tempered with fractures of fine-grained sandstone with white, yellow, red and black pigments. Although the exact source of manufacture of the pottery is unknown, at least generalized sources in the valley of the Rio Salado are indicated. Farther to the north in the San Mateo region, pottery vessels with white paste and residual plates of white clay are characteristic. Silvery flecks of mica are also common in both the slips and the clay bodies of pottery of that area.

The decorated mineral-painted ware from AT 38C is an early variety of Gallup Black-on-white which has framed hachures with framing lines the same width as the hachures. Association with Kiatuthlanna Black-on-white, Red Mesa Black-on-white, Escavada B/w, Cortez(?) B/w, Puerco Black-on-white, early Gallup B/w, Pitoche Banded and Chaco Corrugated suggest that the assemblage dates from about A.D. 900 to about A.D. 1150. Pippen (1979) has reported the time of manufacture and use of Gallup Black-on-white at the Guadalupe Ruin in the upper Rio Puerco valley as being between A.D. 1000 and 1125. Because the period of production of a particular pottery type very often varies from one place to another throughout the Southwest, these suggested dates are, at most, estimates. Decorated jar sherds with vertical longitudinal hatching were classed as Puerco Black-on-white. Sherds with large solids were classed as Escavada B/w, while chevrons, zigzag lines, and volutes were considered to indicate Kiatuthlanna Black-on-white.

Ball Ranch

Pottery of the Ball Ranch Survey and the Espinaso Ridge Site, LA 278

The area encompassed by the Ball Ranch archeological survey was located north of the Arroyo de Los Tanos and just north of the Ball Ranch headquarters.

Petrographic studies of the tempering materials of the Rio Grande glaze-paint wares were first undertaken more than 50 years ago by Anna O. Shepard at Pecos Pueblo (1936, 1942). These investigations laid the groundwork for all subsequent technological investigations of prehistoric and historic ceramics from archeological sites.

Subsequent studies established centers of manufacture and distribution patterns of glaze-paint wares in the upper Middle Rio Grande area (Warren 1967, 1974). The information derived from these studies that pertains to the ceramics of the Ball Ranch survey is included in the following section. The locations of the major Rio Grande pueblos referred to in this report are shown in Map 12-1. LA numbers refer to Laboratory of Anthropology site files.

Guidelines for determining local production at a particular pueblo were established by Shepard (1936, 1942) and Warren (1974, 1977b). For instance, a high percentage of a temper type at a site, with decreasing percentages as distance away from the site increases, usually indicates local production. Regional studies are essential to make such determinations, however. Too often in the past a high percent of a particular temper type has been taken as proof that the pottery was made at a particular pueblo. In addition to the patterns established by temper frequencies within a pottery type at an archeological site, local manufacture may be inferred if:

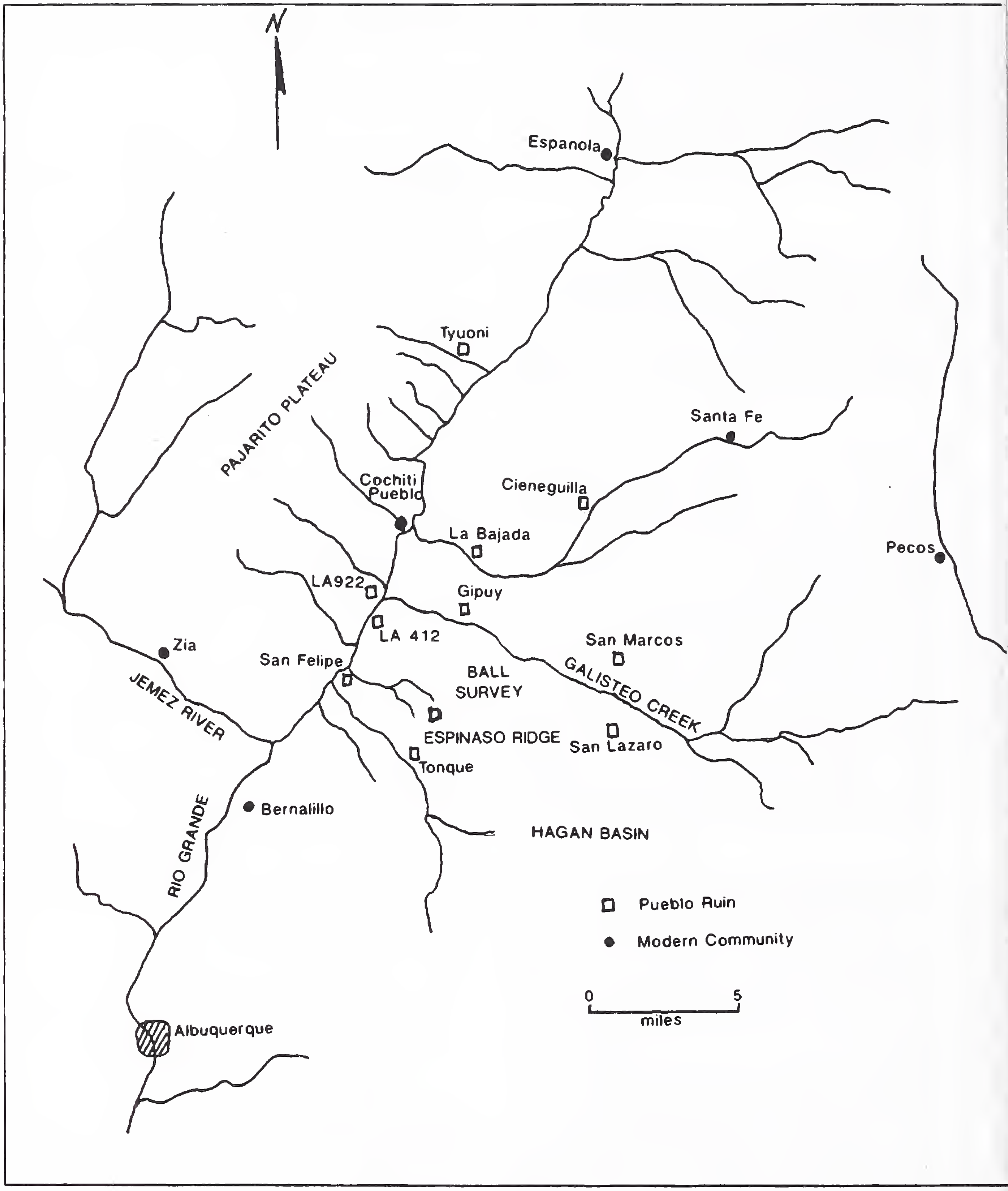
(a) the temper occurs at this site only;

(b) temper source materials are available nearby, or if rock specimens of the temper occur at the site;

(c) the same temper is used throughout the entire occupation of a site;

(d) the percent of tradeware is relatively low;

(e) the ware is found in decreasing amounts at other sites with increased distance away from the suggested source; or



Map 12-1. Area of the Ball Ranch survey, showing major nearby pueblos.

(f) if other archeological evidence indicates pottery manufacture at the site.

Regional patterns of pottery-making and distribution can only be established after hundreds of identifiable potsherds from each site within the archeological area have been analyzed by temper and by type. The results of a number of source-area studies in the Santo Domingo and Galisteo basins have been published elsewhere and are used in this report to assist in the interpretation of the pottery of the Ball Survey (Warren 1968, 1970, 1974, 1977b, 1979a, 1979c, 1979d). The pottery and temper study of the ceramics from Espinaso Ridge (LA 278), a large pueblo on the Ball Ranch, is published here for the first time. The site was located and recorded by H. P. Mera in 1940; glaze-paint groups A through D were reported.

Although not within the Ball Ranch survey area, LA 278 is located about one mile west of the ranch headquarters between Espinaso Ridge and the Arroyo de Los Tanos. Tonque Pueblo is located about five miles to the south.

A total of 296 glaze-paint rims from LA 278 was examined for temper and slip color for each pottery type, including Group A types, Agua Fria Glaze-on-red, San Clemente Glaze-Polychrome, and Espinoso Glaze-Polychrome. Eight sherds of utility ware, Rio Grande Gray, were also examined for temper type.

The rock used for temper in the Group A glaze-paint wares believed to have been produced at LA 278 is a hornblende latite from the Espinaso Volcanics. This is the same rock that was used by potters at Tonque Pueblo. However, the clay used at Espinaso Ridge, or LA 278, is reddish-brown and contains moderate amounts of gold-colored mica. The latter may be conspicuous on the unslipped surfaces of the Group A vessels produced at the site. The hornblende latite is described in the following paragraphs along with numerous other temper varieties that were identified in the pottery from the Ball Ranch survey. The optical properties of the rocks used for temper have been published elsewhere.

The data presented here on LA 278 were compiled by the senior author (A. H. Warren) in 1984, and are based on fieldwork done several years earlier. The LA 278 data are published here because of their relevance to the Ball Ranch survey. Gratitude is expressed to Mrs. Ball for granting permission to investigate the site.

The Temper Materials of the Pottery of the Upper Middle Rio Grande Area

The Espinaso Volcanics

The latitic tuffs, flows and intrusive rocks of the Espinaso Volcanics (Oligocene) were originally described by Charles E. Stearns (1953) in the Tonque and Galisteo areas of New Mexico. Outcrops are extensive throughout the area, but most are characterized by prisms of hornblende or pyroxene. Variations within the volcanic series are generally great enough to distinguish areal differences in the rocks used for temper.

Hornblende latite is fine-grained and characterized by shiny, black prisms of hornblende, which are generally less than 0.5 millimeter in length. Light green, clear prisms of pyroxene and vitreous feldspar rhombs are also distinguishable under a low-power stereoscopic microscope. The hornblende latite used by Tonque Pueblo (LA 240) potters is conspicuous in a light buff to cream-colored paste, giving a "salt-and-pepper" aspect on a fresh fracture. Similar temper was used by San Cristobal (LA 80) potters, but clays used there were white to light gray. The hornblende latite temper at the Espinaso Ridge Pueblo is characterized by a reddish-brown paste and inclusions of gold-colored miabout

Pottery produced in the late 17th and early 18th centuries, possibly in the Galisteo Basin, was tempered with fragments of hornblende latite and rounded grains of quartz in a dark-red to gray clay.

Utility wares associated with glaze-paint pottery, classified in the report as Rio Grande Gray, may be tempered with a coarse-grained variety of the Espinaso volcanics. This utility ware was probably made in the Tonque Pueblo area, but the exact source of the outcrop is not known.

Augite latite of the Espinaso Volcanics is best known at San Marcos Pueblo, north of Galisteo Creek near Cerrillos. The San Marcos temper is distinguished by dark-green prisms and flakey-red prisms in a white porcellaneous matrix.

The volcanic rock used as temper at Gipuy Pueblo (LA 182), on Galisteo Creek above Santo Domingo, appears to be an augite felsite with small crystals of white, chalky feldspar rhombs, yellow-green to greenish-gray augite crystals and silvery-black magnetite grains in a very fine-grained aphanitic groundmass. The crystals give a salt-and-pepper aspect to the rock fragments.

Basalt Scoria, a rock used for temper in the Cochiti and White Rock Canyon areas, is characterized by its earthy-red to reddish-gray color and fine spherical vesicles. Early Group A glaze-paint wares may have crushed sherd temper in addition to the scoria fragments. Gray and occasionally yellowish-brown fragments may be present in potsherds. Occasional white fragments of calcite or opal may be observed.

Basalt of the San Felipe area is a fine-grained, equigranular, holocrystalline rock ranging in color from medium-gray to yellowish-brown. Temper fragments are irregular in form and are generally darker than the clay body of the pottery. Tiny mineral grains are scattered throughout the potsherd. Clear vitreous or milky feldspar rhombs may be seen.

Other basalts were used for temper at the Zia villages and at Canjilon Pueblo, but no sherds from these localities were noted in the Ball Ranch sherd assemblages.

A variety of volcanic rocks was used for tempering pottery in the Santo Domingo Basin and on the Pajarito Plateau. These included rhyolite tuff, gray and black vitrophyres, and vitric tuff temper.

Rhyolite tuff used in the Cochiti area is characterized by clear quartz grains, with occasional dipyramidal crystal faces; clear vitreous crystals of feldspar are also present. The tuff groundmass or matrix may be very light gray to pink or lavender gray. Occasional sherds from the Ball Survey were tempered with rhyolite tuff.

Andesite vitrophyres from the Jemez Volcanics were noted in a few potsherds found at the Ball Ranch survey sites. The andesite vitrophyre, or vitreous andesite, was first described by Shepard (1942) at Kuaua Pueblo, Coronado State Monument. The vitrophyre occurs as cobbles in the stream or pediment gravel near the site. The temper is characterized by a light-gray to brownish-gray or nearly black, semi-vitreous matrix, with phenocrysts of vitreous feldspar and hypersthene. The paste colors range from reddish-orange to reddish-brown; the paste is granular and brittle.

In the Cochiti area, the andesite vitrophyre is darker than the Kuaua temper. Dark-brown to nearly black angular fragments in light-brown, yellow-brown, or brownish-gray paste are characteristic of pottery of the Cochiti area.

Vitric tuff temper consisting of dark-brown sherds, appearing black in cross-section, was present in a few carbon-paint wares, including Santa Fe Black-on-white and Abiquiu Black-on-gray. The temper appears to be indigenous to the Southern Pajarito Plateau.

Precambrian granite, present in local pediment gra[...] well as in outcrops in the Sandia and Sangre de C[...] mountains, was noted in a few utility ware sherds [...] Grande Gray. The temper is characterized by fragm[...] of orange-pink feldspar, light gray quartz and biot[...]

Research Questions and Findings

The potsherds recovered from small archeological [...] located on the Ball Ranch reflect intermittent, prob[...] seasonal, use of these lands by prehistoric peoples. [...] pottery is primarily from the early Pueblo IV pe[...] dating from A.D. 1300 to about 1500 (Kidder 1927), [...] some notable exceptions. Although no large glaze [...] pueblos are located on the survey area, several [...] settlements are located nearby (Map 12-1).

During the laboratory study of the potsherds recov[...] from the numerous small ceramic sites recorded o[...] Ball Ranch, an analysis of the tempering materials [...] individual sherds was undertaken in order to answe[...] following questions:

1. At what Rio Grande pueblos were the ve[...] represented by the potsherds produced?

2. Does the geographic distribution of the potsh[...] from the sites recorded show any patterning [...] would indicate utilization of specific geogra[...] areas by inhabitants of large pueblos through[...] and space?

The tabulation of pottery classifications by temper ty[...] 870 sherds from the Ball Survey and the Espinaso R[...] Pueblo (Tables 12-43 to 12-55) does show some di[...] ences in the distribution of pottery by Pueblo provenie[...] Unfortunately, there was not sufficient time to plot [...] sherd by location and temper type. Sources for o[...] sherds are suggested in Tables 12-56 to 12-59.

At the Espinaso Ridge site, LA 278, pottery from [...] Tonque Pueblo constituted 45 percent of the 296 sh[...] tabulated, while 27 percent of the sherds appear to [...] been from locally-produced vessels (Table 12-43). H[...] ever, during the Group A period, almost one half o[...] ceramics may have been made at LA 278. Character[...] of the Espinaso Ridge glaze-paint wares is crus[...] hornblende latite temper (code 3270) in an orange [...] paste containing occasional flakes of gold-colored mica[...]

The Ball M and W sites (the letters are field-crew de[...] nations) cluster, respectively, south and east of [...] Espinaso Ridge site, LA 278. Pottery with Tonque la[...] temper is still dominant in this group, with a declin[...] the Espinaso Ridge wares and a slight increase in in[...]

Table 12-43. Percentages of Temper Types of Potsherds From Espinaso Ridge Pueblo, LA 278.

Temper Class and Source Area	Agua Fria G/r	S.Clemente G-P	Cieneguilla G/y, G-P	Largo G/y, G-P	Espinoso G-P	S.Lazaro G-P	Rio Grande Gray	Other	Total
Scoria, red-gray, Cochiti area	5%								1%
Rhyolite tuff, Cochiti area									
Vitrophyre, black, Cochiti area									
Vitric tuff, black, Cochiti area									
Basalt, olivine, San Felipe area	20%	7%	13%	9%					8%
Vitrophyre, gray, Bernalillo area									
Hornblende latite, Tonque Area	1%	36%	21%	25%	80%	95%	100%		45%
Hornblende latite, Espinaso Ridge	49%	36%	29%	31%	13%				27%
Augite latite, Gipuy Pueblo	1%		8%	12%		5%			3%
Augite latite, San Marcos Pueblo	2%		17%	14%	3%				5%
Latite, misc., Galisteo-Hagan Basin	16%	7%	8%	9%	4%				8%
OTHER	6%	14%	4%						3%
SUM PERCENT	100%	100%	100%	100%	100%	100%	100%		100%
N	84	14	24	43	102	21	8		296

Table 12-44. Percentages of Temper Types of Potsherds From Ball Survey Sites, M and W Crews.

Temper Class and Source Area	Agua Fria G/r	S.Clemente G-P	Cieneguilla G/y, G-P	Largo G/y, G-P	Espinoso G-P	S.Lazaro G-P	Rio Grande Gray	Other	Total
Scoria, red-gray, Cochiti area	5%	21%	2%						6%
Rhyolite tuff, Cochiti area	2%						3%		1%
Vitrophyre, black, Cochiti area								33%	0.3%
Vitric tuff, brown, S. Pajarito Plateau								33%	0.3%
Basalt, olivine, San Felipe area, La Bajada?	25%	25%	12%				3%		18%
Andesite Vitrophyre, 1% Kuaua Pueblo									0.3%
Hornblende latite, Tonque Pueblo	23%	26%	33%		83%	100%	88%		35%
Hornblende latite, Espinaso Ridge (LA 278)	25%	9%	22%	33%	17%				18%
Augite latite, Gipuy Pueblo	3%	2%	2%						2%
Augite latite, San Marcos Pueblo	7%	12%	22%	67%					12%
Latite, misc.	9%	5%	7%				6%		7%
Quartz, mica, caliche								33%	0.3%
SUM PERCENT	100%	100%	100%	100%	100%	100%	100%	99%	100.2%
N	108	57	88	3	6	2	32	3	299

Table 12-45. Percentage of Temper Types of Potsherds From Ball Survey Sites, C Crew.

Temper Class and Source Area	Agua Fria G/r	S.Clemente G-P	Cieneguilla G/y, G-P	Largo G/y, G-P	Espinoso G-P	S.Lazaro G-P	Rio Grande Gray	Other	Total
Scoria, red-gray, Cochiti area	2%	22%					8%		3%
Rhyolite tuff, Cochiti area	4%						8%		2%
Vitrophyre, black, Cochiti area	2%		1%						1%
Vitric tuff, black, Cochiti, Pajarito area								50%*	1%
Olivine basalt, San Felipe area	20%	17%	4%						12%
Vitrophyre, gray, Bernalillo area	1%								1%
Hornblende latite, Tonque Pueblo	5%	11%	6%		83%		23%		11%
Hornblende latite, Espinaso Ridge (LA 278)	4%		3%	25%	17%				4%
Augite latite, Gipuy Pueblo	30%		6%						13%
Augite latite, San Marcos Pueblo	5%	11%	36%	50%			15%		18%
Latite, misc.,	22%	39%	44%	25%			31%		30%
Sherd temper, misc.	5%							50%Y	3%
Red Granite							15%		1%
SUM PERCENT	100%	100%	100%	100%	100%		100%	100%	100%
N	74	18	70	4	12	0	13	4	195

Notes: * 1 Santa Fe B/g, 1 Abiquiu B/g. Y 1 St. Johns Polychrome, 1 whiteware.

Table 12-46. Percentages of Temper Types of Potsherds From Ball Survey Sites, H Crew.

Temper Class and Source Area	Agua Fria G/r	S.Clemente G-P	Cieneguilla G/y, G-P	Largo G/y, G-P	Espinoso G-P	S.Lazaro G-P	Rio Grande Gray	Other	Total
Rhyolite tuff, Cochiti area	2%								1%
Vitric tuff, black, Cochiti area								20%*	1%
Basalt, olivine, San Felipe area	22%	33%							13%
Vitrophyre, gray, Bernalillo area							9%		1%
Hornblende latite, Tonque Area	5%		33%	25%	67%		27%		15%
Hornblende latite, Espinaso Ridge	2%								1%
Augite latite, Gipuy Pueblo	41%	33%							23%
Augite latite, San Marcos Pueblo			54%	75%			9%		14%
Latite, misc.	27%	33%	13%		33%		46%	40%Y	28%
Red Granite, local							9%	20%Y	3%
Misc. temper								20%Y	1%
SUM PERCENT	99%	99%	100%	100%	100%		100%	100%	101%
NET	41	3	13	4	3		11	5	80

Notes: * 1 Abiquiu B/g, vitric tuff temper Y 2 Pueblo III corrugated, latite temper 1 Pueblo III corrugated, granite temper
1 Pueblo III corrugated, unidentified temper

sive wares from San Marcos, Gipuy, and other Galisteo Basin sites (Table 12-44). The Ball Survey C sites concentrate to the north of LA 278; in general this group has a higher percent of pottery from the Galisteo River area, including Gipuy Pueblo near Santo Domingo, with a lower frequency of Tonque Pueblo wares (Table 12-45). Among the Ball H-crew sites, which concentrate to the north and northwest of Espinaso Ridge, pottery from the Galisteo sites, Gipuy Pueblo (Santo Domingo), San Felipe, and Tonque pueblos are well-represented, and only minor amounts of Espinaso Ridge sherds were noted (Table 12-46).

Various interpretations can be made of geographical and chronological variations in ceramics among the Ball Ranch sites. Land use in an area surrounding a large pueblo, such as the Espinaso Ridge site, should reflect local ceramic production; however, if pottery production is limited, as it often was at large sites without adequate ceramic resource materials, trade-pottery from production centers nearby should be reflected in the ceramics of the small subsistence sites. This seems to be the case.

There is relatively little evidence for ceramics from very distant locations. Abiquiu B/w ceramics, possibly originating in the Jemez Mountains, are present at a few sites. Temper material from a number of sherds indicates a possible origin on the Pajarito Plateau to the north. Granite temper is present in only a few sherds, suggesting a possible origin in the vicinity of the Sandia Mountains or the Rio Grande Valley to the south.

A single Lino Gray sherd, dating approximately 500 to 875 A.D., was found at site BA 40D. This is the oldest pottery type recovered during the survey. The next oldest date is represented by two corrugated clapboard sherds found at site BA 3D, the only appearance of this pottery type during the survey. A corrugated-indented oblique sherd, dating to about 900 to 1300 A.D., came possibly from the south Pajarito Plateau. It was found on site BA 16C. Two St. John's B/r sherds, dating from 1175 to 1300 A.D., were present at BA 21C, a relatively large site. A Santa Fe B/w sherd, dating 1175 to 1350 A.D., was found in another relatively large assemblage at site BA 24E.

Table 12-47. Pottery From BA 23M.

Pottery Type	Form	Temper Type	Suggested Source
Cieneguilla G/y	bowl	Basalt? crystalline red-brown	Galisteo valley, lower?
Yellowware (glaze)	bowl	as above	as above
Glaze-Polychrome	bowl	as above	as above
Whiteware (glaze)	jar	as above	as above
Glaze-on-white	bowl	Augite latite	San Marcos Pueblo
Espinoso G-P	bowl	as above	Galisteo valley
Cieneguilla G/pink (rim abraded)	bowl	Hornblende latite	Tonque Pueblo
Glaze-Polychrome	bowl	as above	as above
Glaze-Polychrome	bowl	as above	as above
Glaze A rim	jar	as above	as above
Glaze-Polychrome	jar	as above	as above
Glaze-Polychrome	bowl	as above	Galisteo valley
Redware (glaze)	bowl	as above	as above
Glaze-on-red	jar	as above	as above
Glaze-on-red	jar	as above	as above
Redware (glaze)	jar	Hornblende latite, gold mica	Espinaso Ridge
Cieneguilla G/y	bowl	Augite latite, gold mica	as above
Glaze-Polychrome	bowl	as above	as above

Site BA 23M dates between A.D. 1375 and 1490, based upon the rim sherds present. Most of tnese appear to belong to the yellow wares of the Galisteo region (Table 12-47). It might be noted, however, that glaze-on-yellow pottery was also produced in the Cochiti area, with local basalt; on the Pajarito Plateau; and on the Santa Fe River at Cieneguilla (LA 16).

The identifiable sherds from BA 24M all belong to Glaze Group A, except for one Santa Fe B/w jar sherd (Table 12-48). It seems probable that most of this assemblage came from vessels produced in the Galisteo Basin. However, both the Cochiti and San Felipe areas are also represented. No sherd-tempered glazewares were present. A time range between A.D. 1350 and 1450 is suggested.

The assemblage from BA 11W appears to be one of the earlier ones in the Ball Survey thus far, with at least two Cieneguilla G/w bowl sherds, representing two vessels (Table 12-50). These may date to the early 1300s.

The sherd assemblage from BA 14W is primarily Group A, but varies by source. Dates range between A.D. 1350 and 1450 or later, and the sherds are mainly from the Hagan and Santo Domingo basins (Table 12-51).

The assemblage from BA 16W is primarily middle G[...] A, dating about A.D. 1325 to 1375. However, [...] possible Glaze E body sherd and a late Glaze F sherd [...] present. There is a variety of source areas for the pot[...] (Table 12-52). One sherd of Rio Grande Gray [...] hornblende latite, is probably from Tonque Pueblo. [...] term "Rio Grande Gray" is taken from Mera's classif[...] tion for utility wares associated with Rio Gra[...] glaze-paint wares; the exterior is unpolished, while [...] interior of the utility jars may be smoothed.

The assemblage from BA 22W may be from a p[...] rebellion site. The coarse-grained temper type[...] characteristic of the Galisteo Pueblo pottery of post 17[...] Similar wares have been noted in the Cochiti area at p[...] rebellion sites. Galisteo Pueblo may have been one of [...] few pueblos that produced glaze-paint wares after 17[...] Three "Carnuel Plain" sherds are probably from [...] vessel. The rim form, and interior polish and smudg[...] are characteristic of the post-1700 Carnuel Plain ves[...] of the Canada de Cochiti (Dick 1968; Warren 1979c[...]

Post-rebellion glaze-paint wares were produced in [...] Cochiti area, as well as at Galisteo Pueblo. Characteri[...]

Table 12-48. Pottery From BA 24M.

Pottery Type	Form	Temper Type	Suggested Source
Glaze-on-red	bowl	Scoria, red, gray	Cochiti area
San Clemente G-P	bowl	Crystalline basalt	San Felipe area
Glaze-Polychrome	bowl	as above	as above
Glaze-Polychrome	jar	as above	as above
Glazeware, red	bowl	as above	as above
Cieneguilla G/y	jar	Augite latite	San Marcos Pueblo
Glaze-on-yellow	jar	as above	as above
Glaze-on-red (E-F?)	jar	Hornblende latite	Galisteo valley
Glaze-on-red	bowl	as above	as above
Rio Grande Gray	jar	large prisms	Tonque area?
Cieneguilla G/y	bowl	gold mica	Espinaso Ridge
Cieneguilla G/y	bowl	as above	as above
Agua Fria G/r(?)	jar	as above	as above
Glaze-Polychrome	jar	as above	as above
Glaze-on-red	bowl	as above	as above
Santa Fe B/w	jar	Quartz, very fine, silver, mica, calche? grains	unknown

Table 12-49. Pottery From Various Ball Ranch Sites, M Crew.

Pottery Type	Form	Temper Type	Suggested Source
BA 2M			
Agua Fria G/r	bowl	Hornblende latite red clay	Espinaso Ridge
Glaze-Polychrome	jar	as above	as above
Glaze-on-white	jar	Augite latite gold mica	Galisteo Valley Espinaso Ridge?
BA 3M			
Glaze-Polychrome, cream slip, utilized sherd	bowl	Hornblende latite red clay	Espinaso Ridge
BA 4M			
Agua Fria G/r	bowl	Augite latite	Galisteo Valley
Whiteware	closed form	as above	as above
Glaze-Polychrome	jar	Hornblende latite	Tonque Pueblo
Espinoso G-P	bowl	as above	Espinaso Ridge
Glaze-on-white	jar	Augite latite + gold mica	as above
BA 5M			
San Lazaro G-P	bowl	Hornblende latite	Tonque Pueblo
BA 6M			
Largo G/y	bowl	Augite latite	San Marcos Pueblo
Glaze-on-yellow Group A	jar	Hornblende latite	Tonque Pueblo
Redware (glaze)	jar, small	as above	as above
Glaze-on-white	bowl	Augite latite gold mica	Galisteo basin
BA 7M			
Glaze-Polychrome	jar	Scoria, red-gray + angular clear quartz	Cochiti area
Glaze-Polychrome, pink slip	bowl	Basalt, fine-grained; red-brown	San Felipe area; Santo Domingo basin
Largo Glaze-Polychrome	bowl	Augite latite	San Marcos Pueblo
San Clemente G-P	bowl	Espinaso latite; white matrix, fine gr.	Unknown
Yellowware (glaze)	jar	as above	as above
Agua Fria G/r rim abraded	bowl	Hornblende latite	Tonque Pueblo
Glaze-on-red	bowl	as above	as above
Glaze-Polychrome	bowl	Espinaso latite + gold mica	Espinaso Ridge?

Table 12-49. Pottery From Various Ball Ranch Sites, M Crew. (Continued)

Pottery Type	Form	Temper Type	Suggested Source
BA 8M			
Cieneguilla G/y	bowl	Basalt, crystalline	San Felipe area
Redware (glaze)	jar	Augite latite	Galisteo basin
BA 9M			
Redware (glaze)	bowl	Espinaso latite, gold mica	Espinaso Ridge, Galisteo basin?
BA 10M			
Glaze-on-yellow	bowl	Augite latite	San Marcos Pueblo
Redware (glaze)	jar	Hornblende latite	Tonque Pueblo
BA 11M			
Redware (glaze)	bowl	Basalt, crystalline	San Felipe area
Redware (glaze)	jar	Augite latite	San Marcos Pueblo?
BA 13M			
Glaze-Polychrome, white slip	bowl	Hornblende latite	Tonque Pueblo
Glaze-Polychrome	bowl	as above	as above
Glaze-on-white	bowl	as above	as above
Whiteware (glaze) one edge abraded	bowl	as above	as above
BA 15M			
Cieneguilla G/y	jar	Augite latite	San Marcos Pueblo
Glaze-Polychrome	jar	as above	as above
Glaze-Polychrome	jar	as above	as above
Redware, glaze	canteen? or stirrup jar	Augite latite + crushed sherd	as above
Bisquitware	bowl	Vitric tuff, black shards	Southern Pajarito?
BA 16M			
Glaze-Polychrome + 1 drill hole	jar	Scoria, red vitreous	Cochiti area
Agua Fria G/r	bowl	Basalt, crystalline	San Felipe area
Glaze-on-white	bowl	Augite latite	San Marcos area
Redware (glaze)	jar	as above	as above
Glaze-Polychrome	bowl	as above + silver mica in slip	as above
Glaze-Polychrome	jar	Hornblende latite	Tonque Pueblo
Rio Grande Gray	jar	as above, coarse-grained	as above

Table 12-49. Pottery From Various Ball Ranch Sites, M Crew. (Continued)

Pottery Type	Form	Temper Type	Suggested Source
BA 18M			
Glaze-on-white	jar	Augite latite	San Marcos Pueblo
Redware (glaze)	jar	Augite latite	Gipuy Pueblo
Whiteware (glaze)	jar	Hornblende latite	Tonque Pueblo
BA 19M			
Agua Fria G/r	bowl	Basalt, crystalline	San Felipe area
Agua Fria G/r rim	jar	Hornblende latite	Tonque Pueblo
Cieneguilla G/w	jar	as above	as above
Glaze-on-yellow	bowl	as above	as above
Glaze-on-red	bowl	Hornblende latite red clay	Espinaso Ridge
Redware (glaze)	jar	Hornblende latite orange clay	as above
Rio Grande Gray	jar	Hornblende latite coarse prisms	Tonque Pueblo
Whiteware (glaze)	bowl	Espinaso latite + white matrix, gold mica	Espinaso Ridge
BA 20M			
Glaze-on-red	jar	Basalt, crystalline	San Felipe area
Cieneguilla G/y rim utilized	bowl	Hornblende latite	Tonque Pueblo
Rio Grande Gray	jar	as above	as above
Polychrome (glaze)	bowl	as above, red clay	Espinaso Ridge
Agua Fria Plain	bowl	Andesite vitrophyre	Bernalillo area (Kuaua Pueblo)
BA 21M			
Agua Fria G/r	bowl	Basalt, olivine	La Bajada area
Cieneguilla G-P	bowl	Hornblende latite	Tonque Pueblo
Glaze-on-white	bowl	as above	as above
Cieneguilla G/w	bowl	as above + red paste	Espinaso Ridge
Glaze-Polychrome	jar	as above, red paste	as above
Glaze-Polychrome	bowl	Latite, white matrix	unknown
BA 22M			
Cieneguilla G/y	bowl	Augite latite	San Marcos Pueblo
Glaze-Polychrome	jar?	as above	as above
BA 25M			
Rio Grande Gray rim (blind indented)	jar	Hornblende latite large hornblende prisms	Tonque Pueblo?
Glaze-on-red	jar	Rhyolite tuff	Southern Pajarito Plateau

Table 12-49. Pottery From Various Ball Ranch Sites, M Crew. (Continued)

Pottery Type	Form	Temper Type	Suggested Source
BA 29M			
Glaze-on-red	bowl	Basalt, crystalline	San Felipe area
Glaze-on-yellow	bowl	Augite latite	San Marcos Pueblo
Agua Fria G/r	jar	Hornblende latite (red clay)	Espinaso Ridge
Redware (glaze)	bowl	as above	as above
BA 26M			
Glaze-Polychrome	jar	Basalt, crystalline	San Felipe area
Glaze-on-white	bowl	Hornblende latite (red clay)	Espinaso Ridge
Glaze-on-red	jar	as above	as above
BA 27(a)			
Glaze-Polychrome	jar	Basalt, crystalline	San Felipe area
Glaze-on-red	jar	Hornblende latite	Espinaso Ridge
BA 27M(b)			
Rio Grande Gray	jar	Hornblende latite large black prisms	Tonque Pueblo area
BA 28M			
Red; white (glaze)	bowl	Espinaso latite, white matrix; gold mica	Espinaso Ridge?
Glaze-on-yellow	jar	as above	as above
Glaze-on-red 1 edge abraded	jar	Augite latite	San Marcos Pueblo?
Glaze-on-white	jar	Hornblende latite	Tonque Pueblo
Pinkware	jar	as above	as above
Rio Grande Gray	jar	as above, large black prisms	as above

are bowl rims with a rim width greater at the top than at the exterior carina (Warren 1974, 1979c).

Another likely historic site is BA 22 H(B), where five glazeware, late F, sherds were identified. The date for these ceramics is 1450 to 1670 A.D. Several other sites, BA 5E, 6E, 19D and 22H, have relatively late ceramic types that range from the 1400s to about 1500 A.D.

Placitas

Introduction

Ceramic evidence obtained during this study sugges prehistoric occupation of the Placitas area from abo A.D. 600 to the arrival of the Spanish in New Mexico in t mid 1500s. In addition, many of the 39 sites investigat for this study exhibited ceramic types indicating settl ment through historic times as well. Ferg (1982) believ that one of the earliest historic settlements occurred "Paraje de las Huertas" in 1661. The source for Ferg

Table 12-50. Pottery From BA 11W.

Pottery Type	Form	Temper Type	Suggested Source
Agua Fria G/r	bowl	Basalt, crystalline	San Felipe area
Glaze-Polychrome	bowl	as above	as above
Glaze-on-red	bowl	as above + red inclusions	as above?
Cieneguilla G/y	bowl	Augite latite	San Marcos Pueblo
Glaze-on-yellow	bowl	as above	as above
Whiteware (glaze)	jar	as above	as above
Whiteware (glaze)	jar	as above	as above
Whiteware (glaze)	bowl	Hornblende latite	Tonque Pueblo Hagan Basin
Glaze-Polychrome - intermediate glaze	jar	as above	as above
Redware (glaze)	jar	as above	as above
Rio Grande Gray	jar	as above	as above
Cieneguilla G/w, green glaze	bowl	as above + crushed sherd	Galisteo basin?
San Clemente G-P	bowl	as above	as above
Glaze-on-red	bowl	as above	as above
Redware (glaze)	bowl	as above	as above
Glaze-Polychrome	jar	as above	as above
Agua Fria G/r? or Polychrome	jar	as above	as above

information is Fray Angelico Chavez's *Origins of New Mexico Families*, (1954). The 1661 settlement may very well have been along the Las Huertas drainage, where numerous sites were recorded during the present study.

Brody and Colberg (1966) indicated that in 1768, the Las Huertas Grant was awarded to Juan Gutierres of Bernalillo, who represented eight families. The source for this information is testimony by Lucas Gurle in New Mexico Surveyor General Records, Report 144, File 88, Reel No. 26, pp. 26, 41, 1881. At the time of the testimony in 1881, it was said that perhaps 500 residents lived in the Las Huertas vicinity. The place now called Las Huertas, "The Gardens," was settled during this time period, shortly before nearby Las Placitas, which is the same as the present village of Placitas. Statements made in 1881 suggest that a severe drought, perhaps in the early or mid 1800s, caused many of the estimated 500 families originally living on the Las Huertas Grant to leave the area. Brody and Colberg believe mining of low-grade copper ores supplemented the incomes of early inhabitants of Las Huertas.

Several previous archeological investigations have been conducted in the vicinity of the current Placitas survey. Brody and Colberg (1966) excavated site LA 8671 between 1963 and 1964. This site was a small three- or four-room historic dwelling located along Las Huertas Creek. The suggested date of occupation is from about 1820 to 1855-1865. Metal artifacts, as well as polychrome glazewares and various other historic ceramics, were found at the site.

Ferg (1982) excavated another historic site, LA 25674, also located along the Las Huertas drainage. Many of the ceramics from Ferg's investigation were polychrome glazewares dating to the late 1700s and early 1800s. Pottery types included Carnue Plain, Casitas red-on-brown, Casitas Polychrome, Ranchitos Polychrome, Majolica glazeware and blackwares. Also identified was a heavily-striated plainware which was compared to the utility wares of Pecos discussed by Kidder and Shepard (1936: 320). The Pecos striated wares, however, probably date much earlier than those found by Ferg at LA 25674. Metal artifacts were also found at the site.

Table 12-51. Pottery From BA 14W.

Pottery Type	Form	Temper Type	Suggested Source
Whiteware (glaze)	bowl	Scoria, red gray	Cochiti area
Glaze-on-red	jar	Crystalline basalt	San Felipe area
Redware (glaze)	jar	as above	as above
Glaze-on-red	bowl	Augite latite	San Marcos pueblo
Redware (glaze)	jar	as above	as above
Cieneguilla G-P	bowl	Hornblende latite	Tonque Pueblo
Glaze-on-yellow	bowl	as above	as above
San Clemente G-P	bowl	as above	as above
Glaze-Polychrome	bowl	as above	as above
Redware (glaze)	jar	as above	as above
Rio Grande Gray	jar	as above	as above
Glaze-Polychrome - worked sherds; worked sherd	bowl jar	Hornblende latite with gold-colored mica	Espinaso Ridge or Galisteo valley
Glaze-Polychrome	bowl	Augite latite + gold-colored mica	as above

Table 12-52. Pottery From BA 16W.

Pottery Type	Form	Temper Type	Suggested Source
Agua Fria G/r	bowl	Scoria, red-gray	Cochiti area
Redware (glaze)	bowl	as above	as above
Agua Fria G/r	bowl	Basalt, crystalline	San Felipe area
Glaze-on-red	bowl	as above	as above
Glaze-Polychrome, Group E?	bowl	Hornblende latite	Tonque Pueblo or Hagan Basin
Redware (glaze)	jar	Hornblende latite with gold-colored mica	Espinaso Ridge?
Glaze-on-red	jar	Hornblende latite with red clay	as above
Redware (glaze)	jar	as above	as above
Glaze-Polychrome	bowl	as above	as above
Rio Grande Gray	jar	Hornblende latite with gray clay	Hagan Basin

Many of the sites found during the present investigation are similar to the historic sites excavated by the researchers discussed above, in that they occur along the margins of Las Huertas Creek. All of the relatively large sites excavated, PL 30A, PL 32A, PL 40A and PL 25B, are located within a few hundred meters of the Las Huertas drainage. Ceramic evidence, however, indicates that all of these sites were prehistoric.

Table 12-53. Pottery From BA 17W.

Pottery Type	Form	Temper Type	Suggested Source
Glaze-on-yellow	bowl	Basalt scoria, red, gray	Cochiti area
Glaze-Polychrome	bowl	as above	as above
Redware (glaze)	jar	as above	as above
Glaze-on-yellow	jar	Crystalline basalt	San Felipe area
Glaze-Polychrome	jar	Augite latite	San Marcos, Galisteo area
Glaze-on-red	jar	as above	as above
Yellowware (glaze)	jar	as above	as above
Glaze-on-yellow	jar	Hornblende latite	Tonque Pueblo area
Redware (glaze)	jar	as above	as above
Glaze-Polychrome	bowl	as above	as above

Table 12-54. Pottery From BA 26W.

Pottery Type	Form	Temper Type	Suggested Source
Glazeware, late F	bowl	Latite + coarse sand	Galisteo Pueblo?
Cicuye G/w, late F	bowl	as above	as above
Carnuel Plain	jar	as above	as above

The diversity of mineral resources available in the area played an important role, influencing not only the lives of prehistoric and historic peoples, but also their ceramic wares. Prehistoric inhabitants utilized sedimentary, metamorphic, and volcanic rocks as temper materials in the manufacture of pottery. The variety of geologic formations close at hand allowed for the creation of a wide variety of pottery types, a trend that carried forward into historic times. Evidence suggesting importation of ceramic wares to the area is relatively minimal, except for PL 30A.

Prehistoric mining of minerals such as malachite and azurite for ornamental purposes may also have taken place. Present-day Santo Domingo Indians have indicated that they use copper ore in the immediate vicinity (personal communication to A. H. Warren). As noted, Brody and Colberg suggested that copper ores were mined by historic inhabitants. Although smelting of ore was not documented in the Placitas Survey, ceramic production may have been a reason for mining efforts in the area.

The pottery recovered and analyzed from the Placitas area is summarized in Tables 12-60 to 12-99. Sites that warrant individual discussion are described below.

Site PL 30A

With minor exceptions, the sherds examined from PL 30A are intrusive to the area (Table 12-64). One sherd of Kwahe'e Black-on-white and twenty-two sherds of Tusayan Corrugated (micaceous) utility wares may have been from vessels produced in the upper-middle Rio Grande valley, and thus indigenous. Two other utility sherds, probably of a Tohatchi Banded utility jar, may have been indigenous to the area also.

The mineral-paint wares intrusive to the site include Kiatuthlanna B/w, Red Mesa B/w, Gallup B/w, Cebolleta B/w, and Socorro B/w. These types are indigenous to the area from the San Mateo and Grants vicinity southward to the Rio Salado and Alamocito Creek drainages in west-central New Mexico. The sedimentary rocks of the Upper

Table 12-55. Pottery From Various Ball Ranch Sites, W Crew.

Pottery Type	Form	Temper Type	Suggested Source
BA 1W			
Cieneguilla G/w	bowl	Hornblende latite	Tonque Pueblo, Hagan Basin
Intermediate Glaze-Polychrome (C?)	jar	as above	as above
Rio Grande Gray	jar	as above	as above
BA 2W(A)			
Cieneguilla G/y	bowl	Basalt, crystalline	San Felipe area
Redware (glaze)	jar	as above	as above
Glaze-on-yellow	jar	Augite Latite	Galisteo Basin
Yellowware	bowl	as above	as above
Cieneguilla G-P	bowl	Hornblende latite	Tonque Pueblo, Hagan Basin
Yellowware (glaze)	jar	as above	as above
Rio Grande Gray	jar	as above	as above
Redware (glaze)	jar	Augite latite + gold mica	Espinaso Ridge?
Largo Glaze-Polychrome	bowl	Hornblende latite + gold mica	Espinaso Ridge?
BA 2W(B)			
Glaze-Polychrome - 1 utilized edge	jar	Scoria, red-gray	Cochiti area
Glazeware, red	jar	as above	as above
Rio Grande Gray	jar	Hornblende latite	Tonque Pueblo; Hagan Basin
Glaze-on-white	bowl	as above	as above
Glaze-on-yellow	jar	as above	as above
Redware (glaze)	jar	as above	as above
BA 4W			
Glaze-on-yellow	bowl	Augite latite	San Marcos Pueblo Galisteo Basin
Glaze-Polychrome	bowl	Hornblende latite	Tonque Pueblo, Hagan Basin
Rio Grande Gray	jar	as above	as above
Agua Fria G/r	jar	as above	as above
BA 5W			
Rio Grande Gray	jar	Hornblende latite	Tonque Pueblo Hagan Basin
Cieneguilla G/y - worked sherd?	bowl	Hornblende latite + gold-colored mica	Espinaso Ridge
Redware(?)	jar	as above	as above
Whiteware (glaze)	jar	as above	as above
BA 6W(a)			
Glaze-on-yellow	bowl	Augite latite	San Marcos Pueblo
Glaze-on-pink	jar	Hornblende latite	Tonque Pueblo
Glaze-on-yellow	jar	as above	as above
Redware (glaze)	jar	as above	as above
Rio Grande Gray	jar	Rhyolite tuff	Pajarito Plateau or Ceja Mb. Santa Fe Fm

Table 12-55. Pottery From Various Ball Ranch Sites, W Crew. (Continued)

Pottery Type	Form	Temper Type	Suggested Source
BA 7W			
Glaze-on-red	jar	Basalt, crystalline	San Felipe area
Redware (glaze)	jar	as above + crushed sherd	as above
Glaze-on-red, edge utilized	bowl	Hornblende latite, red paste	Espinaso Ridge?
Redware (glaze)	bowl	as above	as above
BA 8W			
Glaze-on-white, 1 edge utilized	jar	Hornblende latite	Tonque Pueblo
Rio Grande Gray	jar	as above, coarse	as above
BA 9W			
Glaze-on-red	jar	Basalt, crystalline	San Felipe area
San Clemente G-P	bowl	Hornblende latite	Tonque area
Rio Grande Gray	jar	as above	as above
Glaze-Polychrome	bowl	as above + red clay	Espinaso Ridge
BA 10W			
Redware (glaze)	bowl	Basalt, crystalline	San Felipe area
Rio Grande Gray	jar	as above, gray	as above?
Glaze-Polychrome	bowl	Augite Latite	San Marcos Pueblo?
Glaze-on-red, 1 utilized edge	jar	Hornblende latite, red clay	Espinaso Ridge
BA 12W			
Glaze-on-red, utilized sherd	bowl	Hornblende latite	Tonque Pueblo, Hagan Basin
Redware (glaze)	bowl	as above	as above
Glaze-on-red	jar	as above	as above
Redware, Glaze A rim		as above?	as above?
Redware (glaze)	bowl	as above	as above
Glaze-on-red	jar	as above	as above
BA 13W			
Redware (glaze)	jar	Scoria, red, gray	Cochiti area
Cieneguilla G-P	bowl	Basalt, crystalline	San Felipe area
Yellow ware (glaze)	bowl	as above	as above
Cieneguilla G/y, rim abraded	bowl	Augite latite	San Marcos, Galisteo
Redware	jar	Hornblende latite, red clay	Espinaso Ridge
BA 19W			
Yellowware (glaze)	bowl	Augite latite	San Marcos, Galisteo
BA 21W			
Agua Fria B/w	bowl	Basalt, crystalline	San Felipe area
Glaze-on-red	jar	as above	as above
Agua Fria B/w	bowl	as above	as above
Redware (glaze) (glaze A rim)	bowl?	as above	as above
Agua Fria "Red"	jar	as above	as above
Glaze-on-red	jar	as above	as above

Table 12-55. Pottery From Various Ball Ranch Sites, W Crew. (Continued)

Pottery Type	Form	Temper Type	Suggested Source
Rio Grande Gray	jar	Augite latite?	Galisteo basin
Glaze-on-white?	bowl	as above	as above
Glaze-on-red	jar	as above	as above
Rio Grande Gray	jar	as above	as above
<u>BA 24W</u>			
Whiteware (glaze)	bowl	Augite latite (felsophyre)	Gipuy, Galisteo basin
<u>BA 26W(A)</u>			
Glaze-on-red	jar	Augite latite	Galisteo basin
Glaze-on-white	jar	Hornblende latite	Tonque Pueblo
Redware (glaze)	jar	Hornblende latite + gold mica	Espinaso Ridge
<u>BA 26W(B)</u>			
Glaze-on-red	bowl	Sherd, coarse + augite latite?	Galisteo valley
Glaze-Polychrome	bowl	Hornblende latite + red clay	Espinaso Ridge
<u>BA 26W(C)</u>			
Whiteware (glaze)	bowl	Hornblende latite + red clay	as above
Redware (glaze)	jar	Basalt, vitreous black	Cochiti area?

Cretaceous crop out throughout this area, and provide the white-firing clays characteristic of the black-on-white wares of the region.

Sherds from two Cebolleta Black-on-white bowls were found at PL 30A. This type is considered to be an early style of Socorro B/w, and dates about A.D. 900 to 1150 (Dittert and Ruppe 1951). White-polished slips and solid geometric motifs painted with dark red-brown to black iron paint are characteristic of the type. However, in 1959, Dittert considered Cebolleta B/w to be developed out of Red Mesa B/w, and by A.D. 1100 Cebolleta began to resemble Snowflake B/w. The two sherds from PL 30A have designs consisting of large mineral-paint triangles and probably are the early variety of Cebolleta as described by Dittert and Ruppe.

One sherd of Gallup B/w has widely-spaced framed hatchures and a micaceous slip. Similar potsherds have been noted in the San Mateo-Grants area. One sherd of a Socorro B/w jar completed the assemblage.

A number of polished brownware sherds were temp with an igneous rock composed primarily of lath-sh feldspar crystals. The vessel walls range from three millimeters in thickness. The eight sherds of brownware are probably from one vessel. The vesse tempered with a crushed igneous rock which was posed of white feldspar, sparse smoky quartz, aug and orange-gold colored mica flakes (codes 3110 The senior author has observed similar temper in sc central New Mexico; the sparse quartz and fine-gra texture suggest a monzonitic intrusive. Sir brownwares have been described by Peckham (1976 at Taylor Draw, a pithouse site in southeastern So County. Peckham suggests that the Taylor Draw dates in the late 10th to the early 11th centuries, o basis of tree-ring dates. The ceramics of PL 30A ca be related to a similar time period with a full range about A.D. 900 to 1100.

Table 12-56. Pottery of the Ball Ranch, Crew C.

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
2C	Red body glaze	?	San Felipe area		1
N=2	Glaze, red body	?	" " "		1
4C	Red body glaze	?	Tonque Pueblo, Hagan Basin	1	
N=2	Glaze, red body	?	Tonque Pueblo, Hagan Basin	1	
5C	Judd Solid B/w	?	Espinaso Ridge	1	
N=10	Red body glaze	?	Galisteo Basin (San Marcos)		2
	Red body glaze	?	Tonque Pueblo		1
	Red body glaze	?	Espinaso Ridge		1
	Yellow body sherd	?	Galisteo Basin (San Marcos)		1
	Glaze, yellow body	?	Galisteo Basin & Espinaso Ridge		3
	Glaze, red matte	?	Tonque Pueblo	1	
6C	Rio Grande grayware	?	Tonque Pueblo, Hagan Basin		1
N=4	Glaze, yellow body	?	Espinaso Ridge		1
	Aqua Fria G/r	1315-1425	Espinaso Ridge	1	
	Kuaua Glaze/red	1350-1500	Cochiti area	1	
7C	Plain, white polished	?	Galisteo Basin (San Marcos)		1
N=11	Glaze, red body	?	Cochiti area	1	
	Glaze, red body	?	Santo Domingo area	1	
	Glaze, red body	?	Galisteo Basin (Gipuy)		1
	Glaze, yellow body	?	Galisteo Basin, (San Marcos)		3
	Glaze A rim	1315-1425	Galisteo Basin	1	
	Aqua Fria G/r	1315-1425	San Felipe area	1	
	Aqua Fria G/r	1315-1425	San Felipe area		1
	Espinoso Glaze-Polychrome	1425-1500	?	1	
8C	Redware polished, unslipped	?	Espinaso Ridge	Indet. (1)	
N=16	Redware polished, unslipped	?	Galisteo Basin (Gipuy)		1
	Red body glaze	?	Espinaso Ridge	Indet. (1)	
	Red body glaze	?	Galisteo Basin (Gipuy)		1
	Glaze-Polychrome, red + yellow	?	Espinaso Ridge		2
	Glaze, yellow body	?	Galisteo Basin (Gipuy)	2	
	Agua Fria G/r	1315-1425	Tonque Pueblo, Hagan Basin	2	
	Largo G/y	1400-1450	?	2	
	Espinoso Glaze-Polychrome	1425-1500	Tonque Pueblo	4	
10C(A)	Mineral white, undifferentiated	?	Galisteo Basin (San Marcos)		1
N=6	Red body glaze	?	Upper Rio Grande Valley	1	
	Red body glaze	?	Upper Rio Grande Valley		1
	Glaze, white body	?	Galisteo Basin (San Marcos)	1	
	Glaze, white body	?	Galisteo Basin (San Marcos)		1
	Glaze on yellow	?	Galisteo Basin (Gipuy)		1

Table 12-56. Pottery of the Ball Ranch, Crew C. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
10C(B)	White body sherd	?	Galisteo Basin (Gipuy)		1
N=7	Yellow body sherd	?	San Felipe area	2	
	Glaze-polychrome, undifferentiated	?	Tonque Pueblo	1	
	Glaze, pink body sherd	?	Tonque Pueblo		1
	Glaze/yellow and red matte	?	Tonque Pueblo	2	
11C	Rio Grande Gray	?	Jemez Mountains?		2
N=23	B/r undetermined	?	Galisteo Basin		1
	Yellow body sherd	?	Galisteo Basin (San Marcos)	1	
	Glaze, red body	?	Galisteo Basin (Gipuy)	1	
	Glaze, red body	?	Galisteo Basin (San Marcos)		
	Glaze, white body	?	Tonque Pueblo & Galisteo Basin		2
	Agua Fria Glaze/r	1315-1425	Galisteo Basin	7	
	Cieneguilla G/w	1325-1425	Galisteo Basin (San Marcos)	5	
	Espinoso Glaze-Polychrome	1425-1500	Tonque Pueblo		2
	Agua Fria G/r	1315-1425	San Felipe area?	1	
12C	Red body glaze	?	San Felipe area	1	
N=10	Red body glaze	?	Tonque Pueblo, Hagan Basin		1
	Yellow body sherd	?	Galisteo Basin (San Marcos)	1	
	Glaze-Polychrome, red and yellow	?	San Felipe area		1
	Glaze, white body	?	Tonque Pueblo		1
	Glaze, yellow body	?	Galisteo Basin (San Marcos)	1	
	Cieneguilla Glaze-Polychrome	1325-1425	Galisteo Basin (San Marcos)		1
	Espinoso Glaze-Polychrome	1425-1500	Tonque Pueblo	3	
13C	Red body glaze	?	Galisteo Basin (Gipuy)		1
N=12	Glaze, red body	?	San Felipe area		1
	Glaze, red body	?	Espinaso Ridge		1
	Glaze-Polychrome, red + yellow	?	Cochiti area	1	
	Glaze, yellow body	?	Galisteo Basin (San Marcos)	1	
	Glaze, yellow body	?	Galisteo Basin (San Marcos)		3
	Glaze/yellow & red matte	?	Espinaso Ridge	1	
	San Clemente Glaze-Polychrome	1325-1425	Galisteo Basin (San Marcos)		1
	Cieneguilla Glaze-Polychrome	1325-1425	Espinaso Ridge	1	
	Cieneguilla Glaze-Polychrome	1325-1425	Espinaso Ridge	1	
14C	Agua Fria G/r	1315-1425	Galisteo Ridge (Gipuy)	6	
15C	Rio Grande grayware	?	Galisteo Basin (San Marcos)		1
N=17	Red body glaze	?	Santa Domingo area	1	
	Red body glaze	?	Espinaso Ridge		2
	Yellow body sherd	?	Galisteo Basin (Gipuy) 1		

Table 12-56. Pottery of the Ball Ranch, Crew C. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
	Glaze, red body	?	Espinaso Ridge		3
	Agua Fria G/r	1315-1425	Santa Domingo area	1	
	Agua Fria G/r	1315-1425	San Felipe area		2
	San Clemente Glaze-Polychrome	1325-1425	Cochiti area and Galisteo Basin (San Marcos)	2	
	Cieneguilla Glaze/yellow	1325-1425	Espinaso Ridge	4	
16C N=11	Corrugated-indented oblique	900-1300	South Pajarito Plateau?		1
	Glaze, red body	?	Tonque Pueblo, Hagan Basin	1	
	Glaze, red body	?	Espinaso Ridge		2
	Glaze, yellow body	? (Undetermined)			3
	San Clemente Glaze-Polychrome	1325-1425	Espinaso Ridge		3
	Glaze, red body	?	Galisteo Basin (Gipuy)	1	
17C N=11	Red body glaze	?			1
	Glaze, red body	?			3
	Glaze, yellow body	?			2
	Agua Fria G/r	1315-1425		1	
	Agua Fria G/r	1315-1425			1
	Cieneguilla Glaze-Polychrome	1325-1425		3	
18C N=7	Glaze-Polychrome, undifferentiated	?	Tonque Pueblo	2	
	Glaze, red body	?	San Felipe area		3
	Glaze, yellow body	?	Tonque Pueblo		2
19C N=5	Redware, polished unslipped	?	Galisteo Basin		1
	Rio Grande grayware	?	Tonque Pueblo		1
	Glaze, red body	?	San Felipe area		3
20C N=2	Red body glaze	?	Espinaso Ridge		1
	Red body glaze	?	San Felipe area		1
21C N=17	Rio Grande grayware	?			2
	St. John's B/r	1175-1300		2	
	Yellow body sherd	?.	Tonque Pueblo	1	
	Glaze-polychrome, red + yellow	?	Espinaso Ridge	3	
	Glaze-polychrome, white + pink	?	Tonque Pueblo, Hagan Basin	2	
	Glaze, pink body	?	Galisteo Basin (San Marcos)	1	
	Glaze, yellow body	?	Tonque Pueblo	2	
	San Clemente Glaze-Polychrome	1325-1425	Cochiti area	2	

Table 12-56. Pottery of the Ball Ranch, Crew C. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
	Cieneguilla Glaze-Polychrome	1325-1425	Tonque Pueblo	1	
	Espinoso Glaze-Polychrome	1425-1500	Tonque Pueblo	1	
22C	Rio Grande grayware	?	?		2
N=21	Abiquiu B/w	1350-1480	Jemez Mtns. Pajarito?	1	
	Red body glaze	?	Tonque Pueblo		3
	Red-&-white glaze	?	Galisteo Basin (San Marcos)	1	
	Glaze-Polychrome, undifferentiated	?	Galisteo Basin (San Marcos)		2
	Glaze, red body	?	Tonque Pueblo		3
	Glaze-Polychrome, red + yellow	?	Galisteo Basin (San Marcos)		1
	Glaze, yellow body	?	Galisteo Basin (San Marcos)	1	
	Agua Fria G/r	1315-1425	Galisteo Basin (Gipuy)	1	
	San Clemente Glaze-Polychrome	1325-1425	Galisteo Basin (San Marcos)	3	
	Largo Glaze/y	1400-1450	Galisteo Basin	1	
	Largo Glaze-Polychrome	1400-1450	Galisteo Basin (San Marcos)	2	
23C	Undifferentiated slipped, mineral	?	Middle Rio Grande Valley?	4	
N=17	Agua Fria G/r	1315-1425	Tonque Pueblo, Hagan Basin	13	
24C	Plain, white	?	Galisteo Basin (Gipuy)		1
N=5	Neckbanded, undifferentiated	?	Galisteo Basin (Gipuy)		1
	Red body glaze	?	Galisteo Basin (Gipuy)		1
	San Clemente Glaze-Polychrome	?	Galisteo Basin (San Marcos)	1	
	Glaze, red body	?	Galisteo Basin (Gipuy)		1
25C	Rio Grande grayware	?	Tonque Pueblo		1
N=8	Red body glaze	?	Galisteo Basin (Gipuy)	1	
	Red body glaze	?	Tonque Pueblo		1
	Red body glaze	?	Jemez Mountains		1
	Glaze, red body	?	Galisteo Basin (Gipuy) 2		
	Glaze, white body	?	Tonque Pueblo	1	
	Glaze, yellow body	?	Galisteo Basin (Gipuy)	1	
26C	Santa Fe B/w	1225-1350	Pajarito Plateau (?)		1
N=8	Red body glaze	?	Galisteo Basin (Gipuy)	1	
	Agua Fria G/r	1315-1425	Galisteo Basin (Gipuy)	2	
	San Clemente Glaze-Polychrome	1325-1425	? (undet.)	4	
27C	Red body glaze	?	Galisteo Basin (Gipuy)		1
N=6	Glaze, red body	?	San Felipe area	1	
	Glaze, red body	?	Galisteo Basin (Gipuy)		1
	Agua Fria G/r	1315-1425	?	3	

Table 12-56. Pottery of the Ball Ranch, Crew C. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
28C	Glaze, red body	?	San Felipe area	5	
N=11	Agua Fria G/r	1315-1425	Tonque Pueblo		3
	Cieneguilla Glaze/yellow	1325-1425	Galisteo Basin (San Marcos)	3	
29C	Red body glaze	?	Cochiti area	1	
N=6	Red body glaze	?	Tonque Pueblo, Hagan Basin		2
	Red-&-white glaze	?	Tonque Pueblo	1	
	Agua Fria G/r	1315-1425	San Felipe area	2	
30C(A)	Rio Grande grayware	?	Cochiti area		1
N-9	Red body glaze	?	Galisteo Basin (Gipuy) 1		
	Red body glaze	?	Espinaso Ridge and Cochiti		2
	Glaze, red body	?	Galisteo Basin (Gipuy)		2
	Glaze, yellow body	?	Galisteo Basin (San Marcos)		1
	San Clemente Glaze-Polychrome	1325-1425	Espinaso Ridge	2	
30C(B)	Red body glaze	?	Cochiti area		1
N=3	Glaze, red body	?	Galisteo Basin (Gipuy)		2
31C	Red body glaze	?	Galisteo Basin (Gipuy)		1
N=9	Glaze, red body	?	Galisteo Basin (San Marcos)	3	
	Glaze, red body	?	Cochiti area		2
	Agua Fria G/r	1315-1425	Galisteo Basin (San Marcos)	3	
32C	Red body glaze	?	Tonque Pueblo		1
N=12	Red-&-white glaze	?	Galisteo Basin (San Marcos)	2	
	Red-&-white glaze	?	Galisteo Basin (Gipuy)		1
	Yellow body sherd	?	Espinaso Ridge ?		1
	Glaze, red body	?	Galisteo Basin (Gipuy)		2
	Glaze, pink body	?	Tonque Pueblo		1
	Glaze, yellow body	?	Espinaso Ridge		1
	Glaze, cream body	?	Tonque Pueblo		1
	Agua Fria G/r	1315-1425	Galisteo Basin (San Marcos)	2	
33C	Red body glaze	?	Galisteo Basin (Gipuy)		2
N=4	Agua Fria G/r	1315-1425	Galisteo Basin (San Marcos)	2	
34C	Glaze, red body	?	Tonque Pueblo	1	
N=3	Glaze A Rim	1315-1425	Galisteo Basin (Gipuy)		2
36C	Glaze, red body	?	Galisteo Basin (Gipuy)	1	
N=3	Glaze, red body	?	Galisteo Basin (Gipuy)		1
	Glaze, red body	?	Tonque Pueblo	1	
37C	Glaze, red body	?	Galisteo Basin (Gipuy)	1	
N=10	Glaze, red body	?	Galisteo Basin (San Marcos)		2
	Glaze, white body	?	Tonque Pueblo		1
	Glaze, cream body		Tonque Pueblo		1

Table 12-56. Pottery of the Ball Ranch, Crew C. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
	Glaze A rim	1315-1425	Galisteo Basin (Gipuy)		2
	Intermediate Glaze-Polychrome	1425-1500	Tonque Pueblo		3
38C	Rio Grande grayware	?	Tonque Pueblo		1
N=4	Glaze, red body	?	San Felipe area	1	
	Agua Fria G/r	1315-1425	Galisteo Basin (Gipuy)		2
39C N=11	San Clemente Glaze-Polychrome	1325-1425	San Felipe area	3	
	Glaze, yellow body	?	Galisteo Basin (San Marcos)		3
	Agua Fria G/r	1315-1425	Galisteo Basin (San Marcos)		5
40C	Red body glaze	?	Galisteo Basin (Gipuy)	1	
N=12	San Clemente G-P	1325-1425	Galisteo Basin (San Marcos)	2	
	Glaze, red body	?	Espinaso Ridge	2	
	Agua Fria G/r	1315-1425	Galisteo Basin (Gipuy)	2	
	Agua Fria G/r	1315-1425	Galisteo Basin (Gipuy)		5

Table 12-57. Pottery of the Ball Ranch, Crew D.

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
2D N=4	Rio Grande grayware	?	Middle Rio Grande Valley and Tonque Pueblo		2
	Abiquiu B/w	1350-1480	Jemez Mtns. (Pajarito Plateau)	1	
	Red body glaze	?	Tonque area?		1
3D N=2	Corrugated clapboard, 5 mm.+	850-1075	Tonque Pueblo, Hagan Basin		2
5D	Red body glaze	?	Galisteo Basin (San Marcos)		1
N=15	White body	?	Galisteo Basin (Gipuy)		1
	Glaze, red body	?	Galisteo Basin		1
	Agua Fria G/r	1315-1425	San Felipe area and Galisteo Basin	6	
	Agua Fria G/r	1315-1425	San Felipe area and Galisteo Basin		4
	San Clemente Glaze-Polychrome	1325-1425	Galisteo Basin (San Marcos)	1	
	San Clemente Glaze-Polychrome	1325-1425	Galisteo Basin (Gipuy)		1
7D	Red body glaze	?	Espinaso Ridge	1	
N=3	Agua Fria G/r	1315-1425	Espinaso Ridge		2
8D	Red body glaze	?	Galisteo Basin (San Marcos)	1	
N=12	Red body glaze	?	Galisteo Basin (Gipuy)		1
	White body	?	Galisteo Basin (San Marcos)	1	

Table 12-57. Pottery of the Ball Ranch, Crew D. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
	Glaze A rim	1315-1425	Galisteo Basin (Gipuy)	1	
	Agua Fria G/r	1315-1425	Galisteo Basin & San Felipe area	5	
	Cieneguilla G/y	1325-1425	Tonque Pueblo	3	
9D	Red body glaze	?	Espinaso Ridge	1	
N=21	Rio Grande grayware	?	Cochiti area and Tonque Pueblo		2
	Red body glaze	?	Tonque Pueblo	1	
	Red body glaze	?	Galisteo Basin (San Marcos)		3
	Red and white, glaze	?	Galisteo Basin (San Marcos)	1	
	Yellow body	?	Galisteo Basin (San Marcos)	1	
	Glaze, yellow body	?	Galisteo Basin (San Marcos)	4	
	Glaze, yellow body	?	Galisteo Basin		1
	Glaze A rim	1315-1425	Galisteo Basin (San Marcos)		1
	Agua Fria G/r	1315-1425	San Felipe area	5	
	Glaze, red body	?	Espinaso Ridge	1	
15D	Red body glaze	?	San Felipe area		1
N=5	Glaze, red body	?	Galisteo Basin (San Marcos)	2	
	Glaze, red body	?	Tonque Pueblo		1
	San Clemente Glaze-Polychrome	1325-1425	Tonque Pueblo	1	
16D	Rio Grande grayware	?	Espinaso Ridge?		1
N=13	Red body glaze	?	Galisteo Basin (Gipuy)	1	
	Yellow body	?	Galisteo Basin (San Marcos)		1
	Glaze, red body	?	Galisteo Basin		6
	Agua Fria G/r	1315-1425	Tonque Pueblo	2	
	Cieneguilla Glaze/yellow	1325-1425	Galisteo Basin (San Marcos)	2	
17D	Red body glaze	?	Tonque Pueblo		1
N=8	White body	?	Tonque Pueblo	1	
	White body	?	Galisteo Basin		1
	Glaze, red body	?	San Felipe area		1
	Glaze, white body	?	Espinaso Ridge		1
	Glaze, yellow body	?	Espinaso Ridge		1
	Cieneguilla Glaze/yellow	1325-1425	Galisteo Basin (San Marcos)	1	
	Espinoso Glaze-Polychrome	1425-1500	Galisteo Basin	1	
18D	Glaze, red body	?	Tonque Pueblo, Hagan Basin		2
N=5	Glaze, red body	?	San Felipe area		3
19D	Rio Grande grayware	?	Galisteo Basin (San Marcos)		3
N=16	Glaze, undetermined	?	Galisteo Basin (San Marcos)		1
	Red body glaze	?	Galisteo Basin (San Marcos)	1	
	Red body glaze	?	Espinaso Ridge		4
	Yellow body	?	Galisteo Basin (San Marcos)	1	
	Glaze-Polychrome, red + yellow	?	Galisteo Basin (San Marcos)	1	
	Glaze, yellow body	?	Galisteo Basin (San Marcos)		2

Table 12-57. Pottery of the Ball Ranch, Crew D. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
	Largo Glaze/yellow	1400-1450	Galisteo Basin (San Marcos)	1	
	Espinoso G-P	1425-1500	Tonque Pueblo	2	
21D	Red body glaze	?	Galisteo Basin (San Marcos)		1
22D	Red body glaze	?	Tonque Pueblo		2
N=4	Glaze, red body	?	Galisteo Basin (San Marcos)	1	
	Cieneguilla Glaze/yellow	1325-1425	Galisteo Basin (San Marcos)		1
23D	Red body glaze	?	Tonque Pueblo, Hagan Basin		1
N=2	Glaze, red body	?	San Felipe area		1
24D	Red body glaze	?	Espinaso Ridge and Galisteo Basin		5
N=18	Red body glaze	?	Pajarito Plateau?		1
	Glaze, red body	?	Galisteo Basin & Pajarito Plateau?		2
	Glaze/red-and-white body sherd	?	Pajarito Plateau?		1
	Glaze-Polychrome, red + yellow	?	Galisteo Basin (San Marcos)		1
	Glaze, yellow body	?	Galisteo Basin (San Marcos)		1
	Cieneguilla Glaze/yellow	1325-1425	Galisteo Basin (San Marcos)	1	
	Largo Glaze/yellow	1400-1450	Galisteo Basin (San Marcos)	5	
	Largo Glaze- Polychrome	1400-1450	Galisteo Basin (San Marcos)	1	
25D	Red and white, glaze	?	Cochiti area	2	
N=4	Glaze, yellow body	?	Galisteo Basin (San Marcos)	1	
	Glaze, yellow body	?	Galisteo Basin		1
26D	Glaze-Polychrome, r&y	?	Galisteo Basin	2	
N=3	rCieneguilla Glaze/yellow	1325-1425	Galisteo Basin	1	
27D	Rio Grandegrayware	?	Galisteo Basin (San Marcos)		2
N=18	Red body glaze	?	Espinaso Ridge		4
	White body sherd	?	Galisteo Basin (San Marcos)	1	
	Yellow body sherd	?	Tonque Pueblo	1	
	Glaze, red body	?	Tonque Pueblo, Hagan Basin	1	
	Glaze, white body	?	Galisteo Basin (San Marcos)	1	
	Agua Fria G/r	1315-1425	Jemez Mountains	1	
	San Clemente Glaze-Polychrome	1325-1425	San Felipe area	1	
	Cieneguilla Glaze-Polychrome	1325-1425	Tonque Pueblo		6
28D	Plain, undifferentiated closed form	?	Galisteo Basin		Indet. (2)
N=10	Glaze, white body	?	Galisteo Basin		2
	Glaze, yellow body	?	Galisteo Basin (San Marcos)		1
	Glaze/white-and-red matte	?	Galisteo Basin		1
	Agua Fria G/r	1315-1425	Galisteo Basin (San Marcos)		4

Table 12-57. Pottery of the Ball Ranch, Crew D. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Source Area	Bowl	Jar
29D	Red body glaze	?	Galisteo Basin (San Marcos)		1
N=3	Glaze, yellow body	?	Galisteo Basin (San Marcos)		2
30D	Red body glaze	?	Galisteo Basin (San Marcos)		1
N=3	Red and white, glaze	?	Galisteo Basin (San Marcos)	1	
	Agua Fria G/r	1315-1425	Galisteo Basin (San Marcos)	1	
			(San Marcos)		
31D	Rio Grande grayware	?	Tonque Pueblo		1
N=12	Yellow body sherd	?	Tonque Pueblo, Hagan Basin	1	
	Red body glaze	?	South Pajarito Plateau?		1
	Glaze, red body	?	Tonque Pueblo Hagan Basin	1	
	Glaze, red body	?	South Pajarito Plateau?		3
	Agua Fria G/r	1315-1425	Galisteo Basin	3	
	Cieneguilla Glaze/Yellow	1325-1425	Galisteo Basin (San Marcos)	2	
32D	Red body glaze	?	Galisteo Basin (San Marcos)		1
N=3	Agua Fria G/r	1315-1425	Galisteo Basin (San Marcos)	2	
33D	Red body glaze	?	Tonque Pueblo		1
N=2	Glaze, white body	?	Galisteo Basin (San Marcos)		1
34D	White body sherd	?	Tonque Pueblo	1	
N=4	Glaze-Polychrome, undifferentiated	?	Cochiti Pueblos area		1
	Glaze and red, white body	?	Tonque Pueblo		1
	Glaze, white body	?	Tonque Pueblo Hagan Basin	1	
35D	Red body glaze	?	Galisteo Basin (San Marcos)		1
N=2	Glaze, red body	?	Galisteo Basin (San Marcos)		1
38D	Corrugated-indented smeared	1100-1300	?		1
N=14	Rio Grande grayware	?	Tonque Pueblo		1
	Red body glaze	?	Galisteo Basin (San Marcos)		1
	Red body glaze	?	Cochiti area		2
	Glaze, yellow body	?	Tonque Pueblo, Hagan Basin		1
	Agua Fria G/r	1315-1425	Galisteo Basin (Gipuy)	8	
40D	Lino gray	500-875	Local		1
N=3	Glaze, red body	?			2
120D	Rio Grande grayware	?			1
N=8	Pink body sherd	?			1
	Glaze, red body	?			1
	Glaze and red, white body	?		3	
	Glaze, white body	?			1
	Glaze, yellow body	?			1

Table 12-58. Pottery of the Ball Ranch, Crew E.

Ball Site No.	Pottery Type	Date Range A.D.	Bowl	Jar
2E N=5	Glaze-Polychrome, undifferentiated	?		1
	Glaze, white body	?		3
	Agua Fria G/r	1315-1425	1	
3E	Glaze/white-and-red matte		1	
N=7	Mineral, undifferentiated white, closed form	?	Indet. (1)	
	Glaze, white body	?	2	
	Glaze/white-and-red matte	?		1
	Agua Fria G/r	1315-1425	2	
	Espinoso Glaze-Polychrome	1425-1500	1	
5E	San Lazaro Glaze-Polychrome	1490-1515	3	
6E N=5	Yellow body sherd	?		1
	Glaze, white body	?	1	
	Red rim	?		2
	Largo Glaze/yellow	1400-1450	1	
7E N=11	Yellow body sherd	?		1
	Glaze-Polychrome, undifferentiated	?		2
	Glaze, red body	?	1	
	Glaze and red, white body	?	1	
	Glaze and red, white body	?		2
	Glaze, pink body	?	1	
	Agua Fria G/r	1315-1425	1	
	San Clemente Glaze-Polychrome	1325-1425	1	
	Largo Glaze/yellow	1400-1450	1	
8E N=3	Red body glaze	?		2
	Cieneguilla Glaze/yellow	1325-1425	1	
9E	Red body glaze	?	3	
10E N=12	Red body glaze	?		11
	Glaze, yellow body		1	
11E N=4	Red body glaze		3	
	Red body glaze			1
13E N=6	White body sherd	?	1	
	Glaze-Polychrome undifferentiated	?	2	
	Glaze, white body	?	1	
	Glaze and white, red matte	?	2	
15E N=6	Abiquiu B/w	1350-1480	1	
	Undetermined, unslipped, canteen	?	Indet. (1)	
	Glaze-Polychrome, undifferentiated	?		
	Cieneguilla Glaze/yellow	1325-1425		
16E N=14	Rio Grande grayware	?		
	Red body glaze	?		
	White body sherd	?	1	
	Glaze-Polychrome, undifferentiated	?		
	Glaze, red body	?		
	Glaze and red, white body	?	1	
	Agua Fria G/r	1315-1425	2	
18E N=3	Red body glaze	?		
	White body sherd	?		
	Glaze, white body	?		
19E N=11	Rio Grande grayware	?		
	Red body glaze	?		
	White body sherd	?	1	
	White body sherd	?		
	Glaze, red body	?	1	
	Glaze, yellow body	?	1	
	Agua Fria G/r	1315-1425	1	
	Agua Fria G/r	1315-1425		
	Cieneguilla Glaze/white	?		
	Cieneguilla Glaze/yellow	1325-1425		
20E N=6	Rio Grande grayware	?		
	Red body glaze	?	1	
	Glaze, red body	?		
	Glaze and red, white body	?	1	
	Agua Fria G/r	1315-1425	1	
	Cieneguilla Glaze/yellow	1325-1425	1	
21E N=8	White body sherd	?	1	
	Glaze-Polychrome, undifferentiated	?		

Table 12-58. Pottery of the Ball Ranch, Crew E. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Bowl	Jar
	Glaze and red, white body	?	2	
	Glaze and red, white body	?		1
	Agua Fria G/r	1315-1425	1	
	Cieneguilla Glaze/ white	?	1	
	Cieneguilla Glaze- Polychrome	1325-1425	1	
22E N=5	Glaze-Polychrome, undifferentiated	?		4
	Cieneguilla Glaze/ yellow	1325-1425	1	
23E N=20	Red body glaze	?	Indet. (1)	
	Red body glaze	?	Indet. (1)	
	Yellow body sherd	?		Indet. (1)
	Glaze-Polychrome, undifferentiated	?	1	
	Glaze, red body	?		3
	Glaze and red, white body	?	2	
	Glaze and red, white body	?		1
	Glaze, white body	?	1	
	Glaze, white body	?		1
	Glaze/red-and-red matte	?	1	
	Glaze/white-and-red matte	?	1	
	Glaze A rim	1315-1425		1
	Cieneguilla Glaze- Polychrome	1325-1425	1	
	Cieneguilla Glaze/ yellow	1325-1425	2	
	Intermediate Glaze- polychrome	1425-1500	1	
	Espinoso Glaze- Polychrome	1425-1500	1	
24E N=20	Rio Grande grayware	?		1
	Santa Fe B/w	1225-1350		1
	Red body glaze	?	1	
	Glaze-Polychrome, undifferentiated	?		3
	Glaze, red body	?	3	
	Glaze, red body	?		1
	Glaze and red, white body	?	1	
	Glaze and red, white body	?		2
	Glaze, yellow body	?		1
	Agua Fria G/r	1315-1425		2
	San Clemente Glaze- Polychrome	1325-1425	1	
	Cieneguilla Glaze- Polychrome	1325-1425	2	
	Cieneguilla Glaze- Polychrome	1325-1425		1
25E N=3	Corrugated-blind indented	1350-1600		1
	Glaze red body	?		2
26E N=10	Glaze-Polychrome, undifferentiated	?		5
	Glaze, red body	?		2
	Glaze and red, white body	?	2	
	Glaze and red, white body	?		1
27E N=8	Rio Grande grayware	?		1
	Red body glaze	?		3
	Glaze, red body	?		1
	Glaze and red, white body	?		3
29E N=13	Red body glaze	?	2	
	Yellow body sherd	?	4	
	Glaze, red body	?	1	
	Glaze, yellow body	?	2	
	Agua Fria G/r	1315-1425		4

Table 12-59. Pottery of the Ball Ranch, Crew H.

Ball Site No.	Pottery Type	Date Range A.D.	Bowl	Jar
2H(A)	Rio Grande grayware	?		4
N=13	Red body glaze	?		3
	Glaze-Polychrome, undifferentiated	?		2
	Glaze and red, white body	?		2
	Glaze, white body	?	1	
	Glaze, yellow body	?		1
2H(B)	Rio Grande grayware	?		2
N=15	Red body glaze	?		3
	Yellow body sherd	?	1	
	Yellow body sherd	?		1
	Glaze, red body	?		1
	Glaze, yellow body	?		2
	Cieneguilla Glaze/yellow	1325-1425	1	
	Cieneguilla Glaze-Polychrome	1325-1425	3	
	Largo Glaze-Polychrome	1400-1450	1	
4H	Rio Grande grayware	?		2
N=8	Glaze, yellow body	?	1	
	Glaze and white, red matte	?	2	
	Agua Fria G/r	1315-1425		3
5H	Rio Grande grayware	?		1
N=5	Red body glaze	?		2
	White body sherd	?		1
	Cieneguilla Glaze/yellow	1325-1425	1	
6H	Rio Grande grayware	?		1
N=6	Red body glaze	?		1
	Glaze, pink body	?		2
	Glaze, yellow body	?	1	
	Glaze, yellow body	?		1
7H	Red body glaze	?	Indet. (1)	
N=8	Red body glaze	?		1
	Glaze, red body	?		2
	Agua Fria G/r	1315-1425	4	
8H	Rio Grande grayware	?		2
N=3	Glaze, white body	?		1
9H	Rio Grande grayware			1
N=5	Glaze, red body			2
	Glaze and white, red matte		1	

Ball Site No.	Pottery Type	Date Range A.D.	Bowl
	San Clemente Glaze-Polychrome	1325-1425	1
10H	Rio Grande grayware	?	
N=6	Red body glaze	?	
	Glaze, red body	?	1
	Glaze, red body	?	
	Glaze-Polychrome, red and yellow	?	1
11H	Rio Grande grayware	?	
N=28	Red body glaze	?	1
	Red body glaze	?	
	White body sherd	?	2
	White body sherd	?	
	Glaze red body	?	2
	Glaze and red, white body	?	1
	Glaze and red, white body	?	
	Glaze, yellow body	?	1
	Agua Fria G/r	1315-1425	2
	San Clemente Glaze-Polychrome	1325-1425	1
	Cieneguilla Glaze/white	?	4
	Cieneguilla G/y	1325-1425	1
	Intermediate Glaze-Polychrome	1425-1500	
12H	Red body glaze	?	5
N=11	Glaze, red body	?	2
	Glaze, red body	?	
	Glaze A rim	1315-1425	2
13H	Red body glaze	?	
N=7	San Clemente Glaze-polychrome	1325-1425	1
	Cieneguilla Glaze/yellow	1325-1425	1
	Cieneguilla Glaze-polychrome	1325-1425	1
14H	Rio Grande grayware	?	
N=22	Red body glaze	?	
	Red and white, glaze	?	3
	Red and white, glaze	?	
	San Clemente Glaze-Polychrome	1325-1425	2
	White body sherd	?	1
	Glaze, red body	?	3
	Glaze, red body	?	

Table 12-59. Pottery of the Ball Ranch, Crew H. (Continued)

Ball Site No.	Pottery Type	Date Range A.D.	Bowl	Jar
	Glaze and red, white body	?		1
	Glaze-Polychrome, white and pink	?	1	
	Glaze, white body	?	1	
	Glaze, cream and white	?	1	
	Cieneguilla Glaze/ yellow	1325-1425	1	
	Cieneguilla Glaze-Polychrome	1325-1425	1	
16H N=14	Corrugated blind-indented	1350-1600		3
	Red body glaze	?	1	
	Red body glaze	?		1
	San Clemente Glaze-Polychrome	1325-1425	4	
	Glaze, red body	?	1	
	Glaze, red body	?		1
	Agua Fria G/r	1315-1425	2	
	San Clemente Glaze-Polychrome	1325-1425	1	
17H N=17	Rio Grande grayware	?		1
	Red body glaze	?		5
	San Clemente Glaze-Polychrome	1325-1425	1	
	San Clemente Glaze-Polychrome	1325-1425		2
	Glaze, red body	?		1
	Glaze, pink body	?		1
	Glaze, cream body	?	1	
	Glaze, cream body	?		5
19H	Yellow body sherd	?	1	
21H N=21	Rio Grande grayware	?		4
	White body sherd	?	2	
	Glaze, red body	?		6
	Glaze, white body	?	2	
	Agua Fria B/w	?	4	
	Glaze A rim	1315-1425	1	
	Agua Fria G/r	1315-1425		2
22H(a) N=9	Rio Grande grayware	?		2
	Cieneguilla Glaze/ white	?	1	
	Intermediate Glaze-Polychrome	1425-1500		6
22H(b) N=13	Carnuel plain	1700-1900		3
	Glazeware, late F	1700-1900	5	
	Cicuye glaze white, late F	?	5	
24H	White body sherd	?	1	
26H N=9	Red body glaze	?		2
	White body sherd	?	1	
	Glaze-Polychrome, undifferentiated	?	3	
	Glaze, red body	?	1	
	Glaze, red body	?		1
	Glaze, white body	?		1

Table 12-60. Pottery From PL 8A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Corrugated-Indented Oblique	900-1300	Unknown		3	3

Table 12-61. Pottery From PL 11A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Corrugated blind indented	1350-1600	Tonque Pueblo		1	1
Red glazeware	1350-1600	Tonque Pueblo		4	4
TOTALS				5	5

Table 12-62. Pottery From PL 12A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Glaze-Polychrome	1450-1550	Tonque Pueblo	2		2
TOTALS			2		2

Table 12-63. Pottery From PL 27A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Carnuel Plain	1700-1900	Middle Rio Grande		74	74
TOTALS				74	74

Table 12-64. Pottery and Temper Classification of Selected Sherds, PL 30A.

Pottery Type	Temper Definition and Description	Suggested Sourc
Kwahe'e B/w, bowl	Temper included (1) light gray crushed sherd in darker gray, well-indurated paste with even fracture; (2) quartz, fine-grained, light gray, subrounded grains; (3) feldspar, clear vitreous fine- to medium-grained rhombic crystals; (4) minute flakes of light gold and silver mica in paste. Bowl form has tapered rim; streaky white slip interior; red-brown paint, a line 2.5 mm wide parallel to rim.	Rio Grande Valley
Kiatuthlanna B/w, bowl	Temper (code 2062) consists of abundant grains of (1) fine- to medium-grained subrounded quartz grains; (2) fractures of very fine grained magnetic sandstone; (3) sherd fragments similar to paste; and (4) fragments of pale yellow-brown $CaCO_3$. Design of framed squiggle line hachures in dark brown to black mineral paint on thick, glossy white slip. Light gray paste.	Upper Rio Puerc
Red Mesa/Kiatuthlanna B/w jar sherd	Temper consists of (1) quartz, subangular, clear to lt gray; (2) white sherd fragments. Surface is white, unslipped, with a well-polished glossy surface. Dotted line design is in a thick dark-brown, metallic gray paint.	Cibola area?
Gallup (Prewitt) B/w, bowl	Temper includes (1) very fine, minute feldspar rhombs; (2) sparse crushed sherd in a dark gray, dense paste. Design has widely spaced framed hachures in dark brown mineral paint on a thick, crazed micaceous (silver) slip.	San Mateo area.
Cebolleta B/w, bowl	Temper includes (1) light gray and white sherd fragments; (2) quartz, very fine to fine (0.2-0.5 mm); and (3) sparse amorphous calcite fragments. Designs of large triangle, dark gray paint, on white glossy slip; exterior also slipped.	West Central NM

Table 12-64. Pottery and Temper Classification of Selected Sherds, PL 30A. (Continued)

Pottery Type	Temper Definition and Description	Suggested Source
Cebolleta B/w, bowl	Temper as above; designs include large triangles in dark brown paint; clay paste and slip gray. Traces of minute black hornblende prisms, silver, gold mica in slip.	Alamocito Creek Upper Little Colorado
Socorro B/w, jar	Temper includes very fine-grained quartz ± clear feldspar; dark red-brown triangular motifs on white slip. Paste medium gray.	
Tusayan Corrugated jar (micaceous)	Temper consists of crushed muscovite schist with (1) abundant silver-colored mica, smaller flakes of gold-colored mica; (2) quartz, very coarse (1-2 mm), clear and smoky grains; and (3) feldspar, light orange; also icy, chatoyant white. Paste is dark grayish brown, and dense with an even fracture. Oblique indentations common.	
Tusayan Corrugated jar (micaceous), rim sherd	Temper is as above; rims incomplete, but show only slight seversion above corrugations.	
Plain Utility jar (micaceous)	Temper as above. No suggestion of corrugations.	
Tohatchi Banded jar	Temper unknown; paste heavily carbonized; possible a fine-grained vitrophyre (see below).	
Plain Utility jar Basin?	Temper light gray vitrophyre; unidentified; gray and black inclusions in groundmass.	Santo Domingo
Plain Utility jar	Temper, sandstone: (1) quartz, subangular, clear; smoky± crystal overgrowths; (2) iron oxide grains.	Unknown.
Brownware, polished, jar	Intermediate igneous temper: (1) feldspar crystal laths, white to yellow-cream, elongated rhombic crystals; (2) feldspar crystals, clear, sparse; (3) magnetite grains; (4) mica, orange-gold flakes. Paste is gray to gray-brown; surfaces smoothed to polished; walls 3 to 6 mm.	

Table 12-65. Pottery and Temper Classifications of Selected Sherds, PL 32A.

Pottery Type	Temper Definition and Description	Suggested Source
Cieneguilla G/y, bowl rim	Temper consists of crushed orange to brown sherd, fragments olivine basalt and black vitrophyre in an orange-red paste. The white slip has traces of hematite dust.	San Felipe area
San Clemente G-P, bowl rim	Temper: Fragments of olivine basalt. Paste is orange brown.	San Felipe area
Cieneguilla G-P, bowl rim	Temper: Hornblende latite in light reddish pink paste.	Hagan Basin
Espinoso G-P, bowl rim	Temper: Tonque latite in buff paste.	Tonque Pueblo

Table 12-65. Pottery and Temper Classifications of Selected Sherds, PL 32A. (Continued)

Pottery Type	Temper Definition and Description	Suggested Source
Espinoso G-P, bowl rim	Temper: San Felipe basalt.	San Felipe area
Glaze-on-red, bowl sherd	Temper: Tonque latite.	Tonque Pueblo
Glaze-on-yellow, bowl sherd	Temper: Tonque latite.	as above
Glaze-on-pink, jar sherds	Temper: Tonque latite.	as above
Redware, jar sherds	Temper: Tonque latite.	as above
Glaze-Polychrome, jar	Temper: San Felipe basalt.	
Glaze-on-red, jar sherd	Temper: San Felipe basalt.	
Rio Grande Gray, small jar	Temper: Kuaua?, gray vitrophyre, Bernalillo area.	
Rio Grande Gray, jar	Temper: Kuaua?, gray vitrophyre, as above.	
Rio Grande Gray, jar	Temper: Hornblende latite, coarse, dark gray clay.	Tonque area?
Rio Grande Gray, jar?	Temper: Coarse, volcanic sandstone (2471, Ceja Member, Santa Fe Formation).	
Rio Grande Gray, micaceous	Temper, muscovite schist: dark brown and silver colored mica; schist fragments; from Precambrian muscovite schist.	Placitas area.
Puki lining fragment (exterior is eroded)	Ashes, charcoal fragments, sand grains including Ceja Mb. sandstone; interior of concave-convex fragment is smoothed.	

Table 12-66. Pottery From PL 33A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Plain undifferentiated	?	Unknown	?	?	

Table 12-67. Pottery From PL 34A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Plain undifferentiated	?	?		1	1

Table 12-68. Pottery From PL 35A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Undifferentiated white	?	?	?	?	

Site PL 40A

The ceramic assemblage from PL 40A appears to be mixed (Table 12-70). Yet, with the exception of one carbon-paint sherd classed as Santa Fe B/w, all could be included in a Pueblo II category, dating from A.D. 900 into the 1100s or later. Carbon-paint ware, very similar technologically and stylistically, was produced in the northern San Juan Basin and the southwestern part of Colorado from about A.D. 1050 through 1175. The Santa Fe B/w bowl rim from PL 40A has framed hachures pendent from the rim, very similar to the designs illustrated by Hayes (1964: 64, Fig. 52) and identified as proto-Mesa Verde. Hayes dates Wetherill B/w between A.D. 1050 and 1125, and proto-Mesa Verde, or McElmo Black-on-white, from A.D. 1125 to 1300.

None of the sherds classified at PL 40A is a classic-type sherd; most are more-or-less aberrant. The "early" Gallup B/w might just as easily be a "late" Gallup B/w. The unslipped, polished "redware" bowl sherd could be an attempt to produce a whiteware with red- or brown-firing clays.

Several corrugated sherds are designated as Tusayan Corrugated. This type dates between A.D. 950 and 1300, and is synonymous in part with Mancos Corrugated from the San Juan region and with Coolidge Corrugated from the Red Mesa Valley. The main difference appears to be the geographic area in which the named types were found. The corrugated sherds from PL 40A contain silver and gold mica; the mica may well have been residual in the clays used, as the granitic temper usually does not contain an abundance of mica.

At this time, there is no ceramic evidence that there was more than one occupation at PL 40A. Local sherds, as well as intrusive sherds from west-central New Mexico, appear to be present at the site.

Site PL 22B

The 15 sherds from PL 22B probably represent a single bowl. Decoration of the sherds consists of a black glaze-on-red. The temper is a crushed, welded, andesitic tuff. This material is locally available in the Las Huertas vicinity. This pottery type is prehistoric, ranging in date from about 1315 to 1400 A.D. (Table 12-80).

Site PL 27B

The temper type for the four red glazeware sherds from PL 27B is a latite horneblende. The temper for this pottery type is characteristic of Tonque Pueblo, but is also available in the general area. The suggested date range is 1450 to 1550 A.D. (Table 12-82).

Site PL 35B

Kapo Black is a historic pottery type. The singe sherd at PL 35B dates from about 1750 to 1900 A.D. (Table 12-83). The temper is a pumice with quartz crystals, possibly derived from local geological formations. The senior author believes that the technology for making this polished blackware probably came from Mexican Indians who accompanied the Spanish to New Mexico, beginning in the 1500s. Kapo Black was also found at LA 25674 by Ferg (1982).

Site PL 36B

Two plain-polished indented wares having a coarse grained sandstone temper represent the ceramics of PL 36B. This historic pottery was probably locally made, and dates from about 1690 to 1900 A.D. (Table 12-84).

Site PL 38B

A single undifferentiated bowl sherd was collected from PL 38B. This whiteware sherd has a latite horneblende temper similar to many of the ceramics from Tonque Pueblo. The suggested date range is 1400 to 1550 A.D. (Table 12-85).

Site PL 39B

Three glazeware body sherds were recorded from PL 39B. All three sherds were decorated with a black glaze paint and had a horneblende latite temper common to the

Table 12-69. Pottery From PL 37A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Carnuel plain	1700-1900	Placitas(?)		14	14
Puname polychrome	1680-1900	Placitas(?)		33	33
TOTALS				47	47

Tonque Pueblo area. These ceramics probably date from about 1350 to 1550 A.D. (Table 12-86).

Site PL 40B

Although only seven sherds were analyzed from PL 40B, there is surprising diversity in pottery and temper types. The five Carnuel Plain sherds exhibited three temper types. Two bowl sherds had a chalk temper, one jar sherd had a horneblende latite temper, and one jar sherd had a schist temper containing muscovite and quartz. The plain-polished smudged sherd had a finely crystalline basalt temper, amber to gray in color. The Casitas redware sherd contained a fine-grained igneous temper material with a sugary texture.

All of the ceramics from this site probably date from a 1700 to 1900 A.D. Carnuel plainwares containing cru chalk were not recorded from any other sites in Placitas or Las Huertas areas during this study. V these ceramics are probably of local manufacture somewhat unusual temper materials, including the a rock in the Casitas redware, may reflect a more dis point of manufacture (Table 12-87).

Site PL 43B

PL 43B appears to be a multi-component site, base the ceramics found (Table 12-88). The historic con nent is evidenced by 30 Carnuel Plain jar sherds that from about 1700 to 1900 A.D. All of these sherds ha coarse-grained sandstone temper with subangula

Table 12-70. Pottery and Temper Classifications of Selected Sherds, PL 40A.

Pottery Type	Temper Definition and Description	Suggested Sourc
Kiatuthlanna B/w (Cebolleta B/W?)	Temper includes clear and light gray quartz, subangular and medium-grained; crushed medium gray sherd, icy white feldspar. The paste is medium gray, hackly. The slip is glossy white, interior and exterior, and has traces of silver mica; the design includes a "framed squiggle" with framing solids in a dark red-brown paint.	W. central NM?
Gallup B/w (early?) bowl	Temper includes crushed white sherd and sparse, fine grains of clear quartz and icy white feldspar. The bowl's interior has glossy white slip with abundant silver mica flakes; the mineral paint Dogoszhi style design is in black mineral paint.	W. central NM? Grants, San Mateo?
Kiatuthlanna? B/w bowl rim	Temper and paste as above; dark brown to black mineral paint.	
Kwahe'e B/w, bowl rim	Temper includes crushed white to gray sherd, sparse fine-grained quartz, minute clear feldspar and silver mica flakes. Paste is light gray and dense with conchoidal fracture; paint is fugitive yellow-brown mineral.	
Santa Fe B/w, bowl rim	Temper includes minute particles of caliche, crushed sherd, icy white feldspar; the paste is light medium gray with a granular, even fracture.	Up Mid Rio Gran Placitas area?
Redware?, unslipped bowl	Temper includes clear, subangular quartz, coarse to very coarse; icy white and vitreous feldspar. Paste is red interior, tan exterior; well-indurated and hackly	Middle Rio Gran
Tusayan Corrugated jar (or Mancos Corrugated)	Temper: grantic grus or crushed red granite; coarse flakes of silver mica; sparse gold mica; quartz, coarse, smoky, milky, white; feldspar white and pale orange. Paste light yellow brown, micaceous; may be micaceous clay rather than added mica.	

rounded grains which are also clear to colored. These ceramics were probably made locally.

Prehistoric ceramic types at this site appear to cluster in a time range from about 1000 to 1275 A.D. Socorro black-on-white comprises the majority of the ceramics from this period. The Socorro black-on-white sample had both a fine- to medium-grained sandstone temper and a horneblende latite temper. The vessel or vessels having the sandstone temper may have been brought to the area, possibly from the Rio Salado area southwest of Albuquerque. In contrast, the Socorro black-on-white sherds containing the horneblende latite may have been made locally.

Other prehistoric ceramics include Kwahe'e black-on-white, several undifferentiated whiteware sherds, and several undifferentiated plainware sherds. The Kwahe'e sherd and one whiteware sherd appear to have a caliche temper. Three whiteware sherds have horneblende latite temper, and one has a fine-grained sandstone temper. All of the plainware sherds have a coarse-grained sandstone temper. Most of the early ceramics, with the possible exception of some of the Socorro black-on-white sherds, are probably of local manufacture.

Site PL 45B

PL 45B had four major pottery groups recorded. These were Carnuel Plain, Puname Polychrome, white-on-red and several Casitas classifications (Table 12-90). All of the ceramics at this site contained sandstone tempering, except for the Puname Polychrome sherds which contained altered andesitic welded tuff temper. The Carnuel plainwares had either a coarse- or fine-grained sandstone temper with subangular to rounded and clear-to-colored particles. Casitas Red-on-brown sherds had a coarse-grained sandstone temper with subangular-to-rounded and clear-to-colored grains. The single Casitas Red sherd had a hemititic sandstone temper. The Casitas plainware had a fine- to coarse-grained sandstone temper. The white-on-red sherds exhibited a medium-grained sandstone temper with subangular clear and colored grains. A single plain polished bowl sherd was also present in the sample. Most of the ceramics at the site were undecorated except for the Puname Polychrome, which had red and black mineral paint. While many of the ceramics date from about 1600 to 1900 A.D., the white-on-red sherds suggest a post 1800 date.

Table 12-71. Pottery From PL 74A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Lino gray	500-875	Placitas (local)		9	9

Table 12-72. Pottery From PL 89A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Undetermined	1350-1450	Tonque Pueblo		1	1

Table 12-73. Pottery From PL 125A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Historic redware	1700-1900	Local		1	1

Table 12-74. Pottery From PL 126A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Undetermined black and white	1700-1900	Local		1	1

Table 12-75. Pottery From PL 129A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Not recorded	?	?	1		1
Historic redware	1700-1900	Local		5	5
TOTALS			1	5	6

Table 12-76. Pottery From PL 130A.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Plain polished	?	?		1	1

Table 12-77. Pottery From PL 9B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Redware, polished unslipped	1800-1900	Local	7		7
Puname Polychrome(?)	1680-1900	Local	20		20
Unrecorded (Puname Polychrome?)	1680-1900	Local	1		1
TOTALS			28		28

Table 12-78. Pottery From PL 17B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Pumane Polychrome?	1750-1900	Local		8	8

Table 12-79. Pottery From PL 21B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Corrugated indented, Tusayan	1100-1250			2	2

Table 12-80. Pottery From PL 22B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Agua Fria Glaze-on-red	1315-1425	Local	15		15

Table 12-81. Pottery and Temper Classifications of Selected Sherds, PL 25B.

Pottery Type	Temper Definition and Description	Suggested Source
Lino Gray jar	Temper is a sandstone (code 2062) consisting of coarse grains of clear vitreous quartz, also smoky and white; icy and clear feldspar; amorphous calcite fragments; fractures of fine grained sandstone with white, yellow calcareous, or black magnetitic cement. Sherd surfaces are uneven but polish marks may be present. Source is an unidentified, poorly sorted sandstone.	Upper Rio Puerco
Lino Gray jar	Temper is a sandstone (code 2170) probably derived from the Ceja Mb, of the Santa Fe formation. Coarse to very coarse sand grains; clear vitreous, smoky, or milky quartz; light orange, red-brown, gray, and dark gray chalcedony; and icy clear and red-orange feldspar are characteristic. The paste is light to medium gray and contains residual clay plates characteristic of the Upper Cretaceous clays.	

Table 12-82. Pottery From PL 27B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Red glazeware	1450-1550	Tonque Pueblo		4	4

Table 12-83. Pottery From PL 35B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Kapo black	1750-1900	Local	1		1

Table 12-84. Pottery From PL 36B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Plain polished indented	1690-1900	Local		2	2

Table 12-85. Pottery From PL 38B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Whiteware	1400-1550	Tonque Pueblo	1		1

Table 12-86. Pottery From PL 39B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Glazeware	1350-1550	Tonque Pueblo	3		3

Table 12-87. Pottery From PL 40B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Carnuel Plain	1700-1900	Local	2	3	5
Plain-polished smudged	1700-1900	Local	1		1
Casitas Red	1750-1900	Local	1		1
TOTALS			4	3	7

Table 12-88. Pottery From PL 43B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Carnuel Plain	1700-1900	Local		30	30
Undifferentiated white	1050-1275	Tonque Pueblo(?)	3		3
Undifferentiated white	1000-1250	Local(?)	1		1
Undifferentiated white	?	Local(?)		1	1
Socorro black-on-white	1050-1175	Rio Salado(?); local	14		14
Kwahe'e black-on-white	1050-1250	Local(?)	1		1
Plain undifferentiated	?	Unknown		2	2
Plain undifferentiated	900-1300(?)	Local(?)		1	
TOTALS			19	34	53

Table 12-89. Pottery From PL 44B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Corrugated blind indented	1350-1600	Tonque Pueblo		31	31
Glaze-on-white	1350-1600	Tonque Pueblo	1		1
Glaze Polychrome	1350-1600	Tonque Pueblo		1	1
Glaze-on-white, red matte	1350-1600	Tonque Pueblo	1		1
Same as above	1350-1600	Tonque Pueblo		1	1
TOTALS			2	33	35

Site PL 46B

Five of seven red glazeware sherds from PL 46B contained a finely crystalline basalt temper (Table 12-91). The remaining two red glazeware sherds had a horneblende latite temper. These ceramics probably came from the Tonque Pueblo vicinity. Five Espinoso Glaze-Polychrome sherds, decorated with a brown glaze paint, also contained a crystalline basalt temper and are likely to have originated from the Ball site (LA 274), located several miles north of Tonque Pueblo (not within the Ball Ranch project area). One Espinoso sherd contained a horneblende latite temper as did the single red-on-white glazeware. One corrugated Blind Indented sherd had horneblende latite temper and one had basalt temper. The single plain-polished sherd exhibited a crystalline lithic temper of igneous origin. Most of the ceramics from Placitas Site 46B date from about 1425 to 1490 A.D.

Site PL 57B

PL 57B is a prehistoric site with most ceramics dating from about 1315 to 1515 A.D. as shown below.

Carnuel Plain	1700-1900
San Clemente Glaze-Polychrome	1325-1425
Agua Fria Glaze-on-red	1315-1425
Cieneguilla Glaze-Polychrome	1325-1425
Intermediate Glaze-Polychrome	1425-1500
Glaze-on-red, white body	1425-1515
Glaze-Polychrome, white and pink	1425-1500
Pink body sherd	1375-1500
Glaze-Polychrome, red matte	1375-1500
Glaze-Polychrome, red and pink	1375-1500
Glaze/red body sherd	1375-1500
Glaze-on-white body sherd	1350-1450
Glaze, red body sherd	1325-1400
Yellow body sherd	1375-1500
Glaze, undetermined	1325-1450

Although 21 of 133 sherds recorded from the site are Carnuel Plain, which dates about 1750 to 1900 A.D., 14 of 15 pottery type categories identified are prehistoric. The lack of other historic pottery types suggests that the Carnuel plain ceramics may have been an accidental occurrence at the site, possibly resulting from a single vessel. It is also possible, however, that the Carnuel plain sherds represent a brief historic occupation.

The diversity of prehistoric pottery and temper types at this site may reflect a relatively long duration of occupation. The site, located along the edge of Las Huertas Creek, may have been somewhat of a crossroads location. Based on temper types, ceramics at the site seem to represent pottery types manufactured from various remote locations, including the San Felipe area, Hagan Basin, Tonque Pueblo and possibly the San Marcos area. In addition, some of the pottery found at this site was probably manufactured nearby (Table 12-94).

Site PL 74B

The entire sample of 20 sherds from PL 74B consists of Casitas Red-on-brown ceramics. The temper is diabase basalt. This pottery was probably made locally and dates from about 1700 to 1900 A.D.

Placitas Isolated Finds

The four isolated potsherds studied from the Placitas survey appear to have been produced in the general vicinity of the survey area (Table 12-98). A Santa Fe Black-on-white sherd contained a vitric tuff temper, and was likely produced along the Rio Grande valley to the west. The vitric tuff or pumice characteristic of this pottery type was a geological product of the massive Bandelier tuff deposits produced by volcanic activity in the Jemez Mountains. One glaze-on-red sherd had a horneblende latite temper and may have come from the Tonque Pueblo vicinity. A whiteware sherd with volcanic sandstone temper containing silver mica may be from the Placitas area. A Puname Polychrome sherd had a fine-grained micaceous sandstone temper and was probably produced near the survey area. The dates of the isolated ceramics are both prehistoric and historic.

Table 12-90. Pottery From PL 45B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Carnuel Plain	1700-1900	Local		20	20
Puname Polychrome	1680-1900	Local		13	13
Casitas red-on-brown	1750-1900	Local	1	2	3
Casitas Red	1750-1900	Local	1		1
Casitas Plain	1750-1900	Local	4	5	9
White-on-red	1800-1900	Local	9		9
Plain polished	1750-1900	Local	1		1
TOTALS			16	40	56

Table 12-91. Pottery From PL 46B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Red glazeware	1425-1490	Tonque Pueblo		7	7
Red-on-white glazeware(?)	1425-1490	Tonque Pueblo	1		1
Espinoso Glaze-Polychrome	1425-1500	Ball Site (LA274)	6		6
Corrugated Blind-Indented	1350-1600	Tonque Pueblo	2		2
Plain polished	1325-1600	Local		1	1
TOTALS			7	10	17

Table 12-92. Pottery From PL 51B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Santa Fe Black-on-white	1225-1350	Rio Grande Valley,	11		11

Table 12-93. Pottery From PL 53B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Corrugated Blind-Indented	1350-1600	Tonque Pueblo	1		1

Table 12-94. Temper of Pottery Types From PL 57B.

Pottery Type	Temper Definition and Description	Suggested Source
Carnuel Plain	Temper consists of sandstone having coarse grained sub-angular clear and colored grains. All 21 Carnuel sherds are jar sherds without decoration.	Probably local
San Clemente Glaze-Polychrome	Temper consists of augite latite characteristic of the Espinaso volcanics. Paint type was undetermined on the 10 bowl sherds. Manufacture may have been in the vicinity.	Local ? or San Marcos area
Agua Fria Glaze- on-red	Temper is welded tuff, intermediate, devitrified. Five sherds with undetermined paint type comprise the sample. This pottery type was manufactured widely throughout the middle and upper Rio Grande valley.	Uncertain
Cieneguilla Glaze-Polychrome	Temper consists of a very fine grained hornblende latite. Most of the 16 bowl sherds in the sample had a brown glaze paint.	Placitas or Hagan Basin
Intermediate Glaze-Polychrome	Temper as above. All 10 jar sherds exhibit a black glaze paint and may have been produced in the same areas noted for the above pottery type.	As above
Glaze-on-red, white body	Temper as above. Only one of the 27 sherds has a black glaze paint. Most of the sherds are from jars, but a few are from a bowl form.	As noted above
Glaze-Polychrome, white and pink	Temper as above. Both bowl sherds exhibited a black glaze paint and framed geometric design.	As above
Pink body sherd	Temper is a fine grained crystalline basalt. Two of the three sherds exhibit a brown glaze paint.	Rio Grande valley near San Felipe
Glaze-Polychrome, red matte	These two sherds have the same basalt temper as above and probablycome from the same area. Both sherds have a bowl form.	As above
Glaze-polychrome, red and pink	Temper is intermediate igneous rock containing feldspar and gold mica. Manufacture of these three jar sherds was probably local.	Local
Glaze; red body sherd	Only two jar sherds of this pottery type and temper were recorded. Both sherds had brown glaze paint and a temper and manufacture location as above.	As above
Glaze-on-white body sherd	Temper for six sherds is hornblende latite and for three sherds it is augite latite. Paint type is primarily black glaze; one sherd is brown glaze. The augite may be from the San Marcos area and the hornblende material is probably from the Tonque Pueblo area.	San Marcos/ Tonque Pueblo
Glaze/red body sherd	Fourteen of the 21 sherds in this sample exhibited a devitrified intermediate welded tuff temper. Two of these had a black glaze paint. One sherd had a hornblende latite temper. Three sherds were tempered with andesite vitrophyre.	Local

Table 12-94. Temper of Pottery Types From PL 57B. (Continued)

Pottery Type	Temper Definition and Description	Suggested Source
Yellow body sherd	Temper for the single sherd recorded was augite latite, possibly coming from the Espinaso Volcanics to the north.	
Glaze, undetermined	Temper is hornblende latite. This single bowl sherd may have come from the Tonque Pueblo vicinity.	

Table 12-95. Pottery From PL 61B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Historic whiteware	1700-1900	Local		1	1

Table 12-96. Pottery From PL 65B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Casitas red-on-white	1750-1900	Local	19		19

Table 12-97. Pottery From PL 68B.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Corrugated blind indented	1350-1600	Tonque Pueblo		7	7

Table 12-98. Some Isolated Finds From the Placitas Survey.

Pottery Type	Date Range A.D.	Source Area	Bowl	Jar	Total
Santa Fe Black-on-white	1225-1350	Rio Grande Valley Bernalillo to Cochiti	1		1
Glaze-on-red, body sherd	1425-1550	Tonque Pueblo		1	1
Whiteware	1700-1900	Placitas		1	1
Puname polychrome	1680-1900	Local		1	1
TOTALS			1	3	4

Chapter 13 • Historic Sites

Louanna Haecker and Charles Haecker

Placitas and Ball Ranch Tracts

Area History

For the purpose of this report, the Placitas and Ball Ranch tracts will be reviewed together since they have essentially the same or similar histories, insofar as these tracts are inseparable parts of the geographically larger entities of southern Sandoval and southwestern Santa Fe counties. The following historical sketch is that of an area of approximately 200 square miles. It includes not only the Placitas and Ball Ranch tracts and the land that adjoins them but also the town of Bernalillo, located seven miles from the village of Placitas. Hereafter this defined area will be referred to as the study area.

The first historically significant occurrence within the study area is that of Coronado and his army establishing a temporary headquarters in 1541 at a Tiquex village, in the vicinity of present-day Bernalillo. This village was also Coronado's point of departure for his journey to Kansas in his search for Quivira. Several ranchos existed in the neighborhood of Bernalillo prior to the Pueblo Rebellion of 1680, and following the reconquest by De Vargas. The village of Bernalillo was officially founded in 1698. A small force of soldiers were garrisoned in the town, and aided the settlers in repelling the periodic raids by nomadic Indians. The larger landowners became prosperous by running great herds of cattle and sheep, and this portion of the Rio Grande was noted in colonial New Mexico as some of the best farm and ranch lands in the province (Drake 1936:1).

Archeological remains indicate that several colonists lived in the Placitas area during the late sixteenth and early seventeenth centuries; however, no significant settlement developed until 1766 when Juan Gutierrez petitioned the Governor for a grant of land within Las Huertas Valley, for himself and eight tenant families. Two years later, when the petition was granted, 21 families were already living in Las Huertas, located about a mile northeast of the present village of Placitas (Matthews 1987:9).

Life in the Rio Grande Valley north of Albuquerque during the eighteenth and nineteenth centuries was dominantly peasant in character. There was a strong tendency toward the small, individually-owned tract of land for the farm and home, and upon free access to community-owned pastures and grazing lands. In the villages that grew upon the various land grants, the people pursued their own independent course unhampered by *patrones* (the patron system existed only to the south on the vast ranches that came to be established there). Throughout the northern Rio Grande Valley there prevailed a uniformity of economic and social position; in the villages life was simple, stable and characterized by a single level of economic well-being (Harper et al. 1943:58).

Las Huertas followed the northern New Mexico pattern of soldier-peasants who occupied a grant of land as a community. The village was constructed with defense in mind, with all of the houses connected so that the rear of the buildings formed a defensible windowless wall. The various corrals and agricultural areas were situated near the village, were marked out and divided amongst the community's families. As with other communal grants, it was required that the grantees establish a school in order to teach children the rudiments of the Catholic faith (Smith 1973:25).

The economy of Las Huertas was based on agriculture and grazing. Goats and sheep were the main herding animals and burros the beasts of burden. The farms were small. Crops were grown on both dry and irrigated land. Major crops were wheat, corn, beans and squash, as well as some onions, chili and herbs. Fruit, including cotton, tobacco and grapes for wine, supplemented the major crops. Fishing and hunting added to the subsistence cycle. The people of Las Huertas usually did their trading with the Indians of San Felipe Pueblo located 12 miles to the north, bartering sheep and grain for pottery and woven material. Trade was conducted at regional markets in the larger towns and, on a larger scale, with an annual caravan from Chihuahua. Subsistence and survival consumed most of the villagers' time. There was little time for leisure activities; simply enjoying the meager fruits of one's labors was difficult enough when raiding Indians appropriated most of it. However, this frontier settlement not only survived but was even thriving by 1807 when there were 294 residents (Smith 1973: 32).

The stability of Las Huertas was shaken in 1810 with the outbreak of the Mexican War of Independence. Spanish forces were diverted from the northern frontier and, as a result, the Comanche and Navajo intensified their raiding. By 1823 the raids were so serious that the governor ordered the residents of Las Huertas to abandon their village. Most of the families moved to Algodones; others went to Socorro, Albuquerque and Cienega. By the 1830s, however, some of the families had begun to move back onto the land grant. They built the new, defensively-constructed communities of La Madera and Tejon, located within six miles of old Las Huertas. At sometime during this era, the village of Las Placitas was settled. It was located one mile southwest of old Las Huertas. By 1843 there were sixteen families in the new village (Smith 1973:38).

The conquest of New Mexico in 1846 by the United States ushered in a period of clashing lifestyles and modernizing trends for New Mexico as a whole. Yet this change also meant a time of peace and prosperity for the occupants of the northern Rio Grande Valley. The United States Army stemmed the raids by the Navajo and Comanche to the extent that the villagers within the study area were able to build their homes closer to the fields and water sources, although in Las Placitas the majority remained close to the plaza. However, the villagers were able to disperse after 1863 when the Navajo were finally subdued.

The suppression of the nomadic Indians meant that the Hispanic and Puebloan villagers within the study area realized some economic stability. A few of the larger landowners ran thousands of sheep and cattle and were able to participate in the new cash economy that was introduced by the Anglos. There was a short-lived expansion of both the poor Hispanic herders and farmers on to lands once controlled by the nomadic Indians. However, the small-scale farmer could not compete with the large-scale sheepherder. Land could no longer be taken as a grant and then used as collateral to pay off debts (Meinig 1971:34).

In 1891 the people of Placitas had to defend the title to their land grant, San Antonio de Las Huertas, after the U.S. Congress created the Court of Private Land Claims. The Land Court approved the grant, but the grantees could only pay their lawyers with land. That resulted in their loss of the eastern one-third of the grant. The grant shrunk again during the 1900s when the government claimed land in the Sandia Mountains, land that had at one time provided free grazing, wood and food for the villagers (Meinig 1971).

The heirs of the Lo de Basquez Grant experienced far more serious problems than the Las Huertas grantees when they petitioned the U.S. Land Claims Court in 1872 for confirmation of their grant claim. (The Lo de Basquez Grant included the Ball Ranch tract, which is presently administered and leased by the BLM). The 76,000 acre Lo de Basquez Grant was given to one Jose Basquez in 1727 by Governor Juan Bustamonte. This grant was described by the petitioners as bounded by the Santo Domingo and San Felipe Grants to the west, La Bajada Hill to the north, Una del Gato Arroyo (a tributary of Tonque Wash) to the south and "...on the east, by Los Alamitos ..." (Bowden 1969: 502). (Los Alamitos is presumably a linear geographic feature, but it has not been identified by this researcher).

According to the Land Claims Court Records, the petitioners stated that they and their ancestors used this land grant for raising livestock, and that this land had insufficient water for agriculture (Bowden 1969:503). This suggests that Basquez and his descendants may not have resided within their grant land but rather in some well-watered area near it. In any event, the grant petitioners' claim was rejected in 1891 when they [illegible] unable to produce sufficient documentation or evid[illegible] that this land was legally theirs. The petitioners [illegible] filed suit against the United States, with the hope [illegible] such documentation would eventually be found in Me[illegible] City.

In 1899 the U.S. Government provided evidence tha[illegible] Lo de Basquez Grant boundaries conflicted with tho[illegible] the Pueblo of Santo Domingo, the Ortiz Mine, the M[illegible] de Juana Lopez Grant and the La Majada Grant. [illegible] ultimate piece of evidence against the plaintiffs w[illegible] document which indicated that the land grant had [illegible] revoked by Governor Cruzat y Gongora a few years [illegible] it had been given. With this piece of documentatio[illegible] evidence the plaintiffs dropped their suit and the C[illegible] dismissed the petition (Bowden 1969:504, 504).

Over the years, as shrinking pasture land and o[illegible] economic problems made farming and ranching [illegible] profitable within the study area, many of its inhabit[illegible] left to seek work in Albuquerque. However, the st[illegible] area still remained an Hispanic enclave until the 19[illegible] when Albuquerque began to grow. These cultural cha[illegible] are best exemplified within the village of Placitas. [illegible] first Anglo took up residence there in 1948 and ot[illegible] soon followed, opening small stores and a restaur[illegible] According to one present-day resident, the Anglo [illegible] comers of the 1940s and 1950s did not radically u[illegible] the traditional lifestyles of the local Hispanics since [illegible] were attracted to these lifestyles. These newcomers [illegible] living rather frugally and therefore did not significa[illegible] change the nature of the village.

A new influx of Anglos came to the Placitas area du[illegible] the 1960s and 1970s. These were the countercult[illegible] advocates, or "hippies." Land developers also be[illegible] buying land in and around Placitas, and selling lot[illegible] those who could afford the increasingly higher prices [illegible] which the land was and is now selling (Matth[illegible] 1987:10,11).

Placitas Historic Sites

All of the sites within the Placitas survey boundaries [illegible] located in Sandoval County. The sites were plotted on [illegible] Placitas 7.5 minute topographic map. Placitas s[illegible] described here, and Ball sites described below, hav[illegible] least one historic artifact, although some sites are [illegible] rectly considered to be primarily of prehistoric origi[illegible].

Site PL 1A

Elevation: 5650 ft. Topography: hill slope above [illegible] Huertas Creek. Vegetation: juniper, native grasses. [illegible]

Description: The site consists of a 65 x 30 feet foundation constructed of river cobbles and divided by a north-south cobble alignment into two rooms. The northwest foundation corner has been disturbed by a gas pipeline. No artifacts were noted by the surveyors. Testing of this site in November 1981 revealed it to be completely sterile (see Appendix 13-4). Date Range: not known.

Site PL 3A

Elevation: 5730 feet Topography: plains. Vegetation: juniper-grassland associations. Site Description: The site consists of a four-room, unshaped-stone foundation. There is an informal enclosure on the west side. This site was excavated (see Appendix 13-5). Artifact Analyses: Artifacts collected during survey include:

- 11 bottle glass fragments
  - 7 amber-colored. Date: 1880 to present (Ward et al. 1977:240).
  - 4 purpled. Date: 1880 to 1925 (Newman 1970: 70-74).
- 2 window glass fragments
- 5 dinnerware sherds
- 1 purpled. Date: 1880 to 1925 (Newman 1970:70-74).
- 1 piece of flat iron with a punched hole.
- 1 soldered "ring-and-hole" tin can. Date: pre-1922 (Clark 1977:44).
- 2 nails
  - 1 square cut. Date: pre-1890s (Clark 1949:351-355).
  - 1 wire. Date: post-1890s (Clark 1949: 351-355).

Date Range: This structure was built in the late 19th century by Mariano Otero of Bernalillo. It housed farm workers who tended nearby fields.

Site PL 17A

Elevation: 5540 feet Topography: ridge slope. Vegetation: none present. Site Description: This is a historic petroglyph with the following letters and numbers incised onto a boulder:

D A

B 10

No artifacts were noted. Date Range: not known.

Site PL 18A

Elevation: 5520 feet Topography: ridge. Vegetation: none present. Site Description: The site consists of two encircled crosses lightly pecked onto a boulder. The crosses cover an area one foot square. No other artifacts were noted by the surveyors. Date Range: not known.

Site PL 20A

Elevation: 5540 feet Topography: north-facing hill slope. Vegetation: none present. Site Description: The letters "A C" have been lightly pecked onto a small boulder. Approximately 30 to 35 feet west are several other scratches, but no definite pattern could be discerned. No artifacts were recorded. Date Range: not known.

Site PL 21A

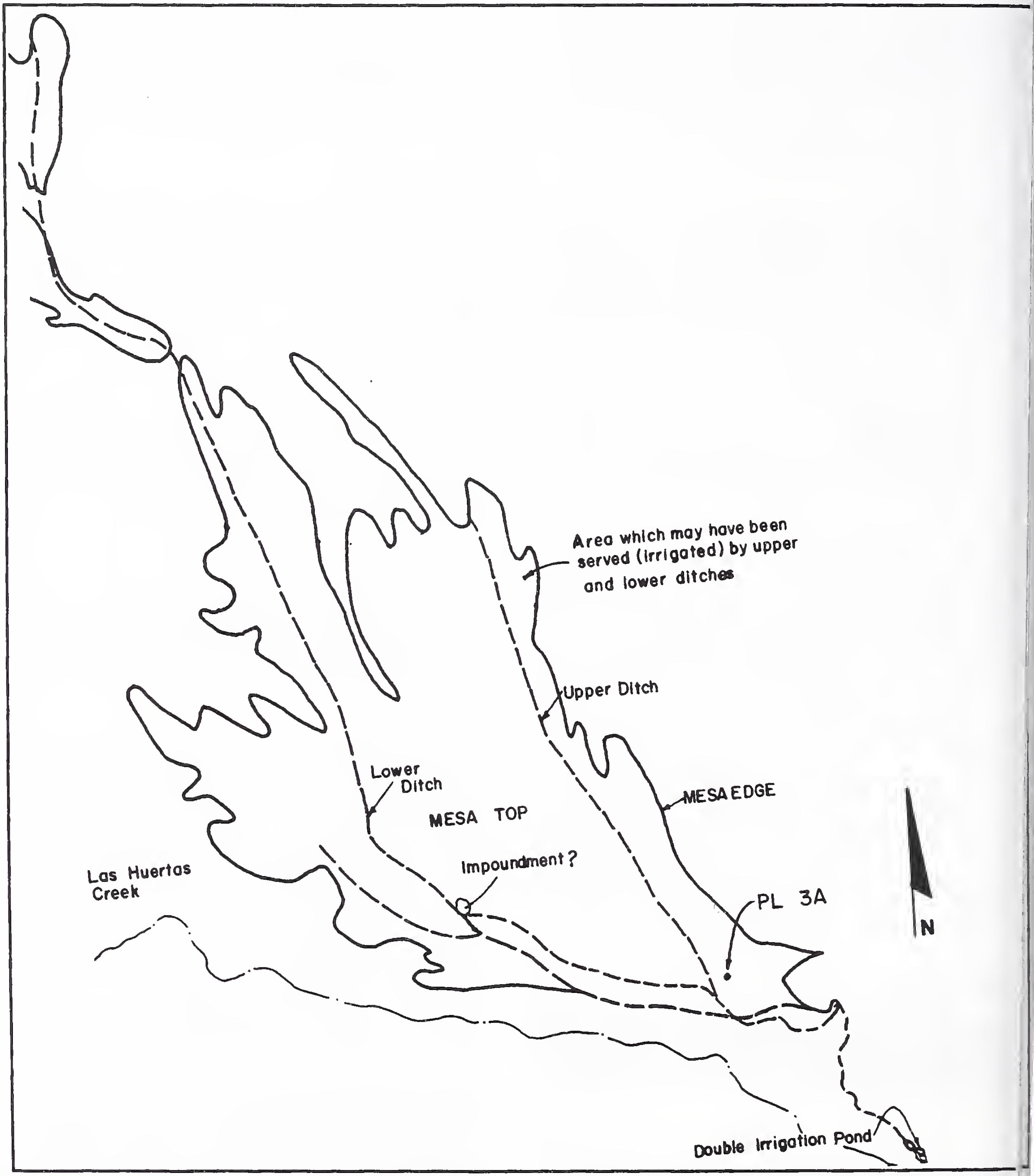
Elevation: 5560 feet Topography: ridge. Vegetation: none present. Site Description: This site is a small boulder that has an encircled cross, about six-inch long, pecked onto its surface. No artifacts were noted. Date Range: not known.

Site PL 25A

Elevation: 5600 feet Topography: hillslope. Vegetation: juniper, native grasses. Site Description: This site is an extensive system of irrigation ditches, defined at times by ditches, by rock borders, or by lines of juniper trees along the ditches.

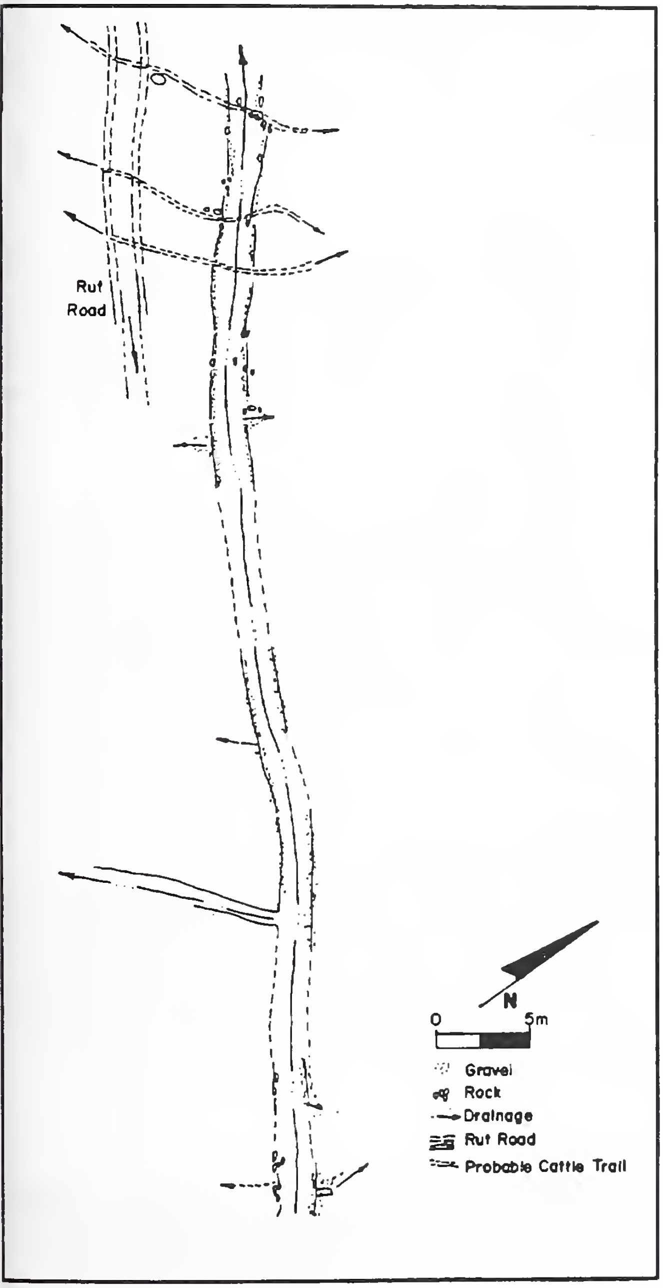
The ditches, as seen in Map 13-1, were delineated on the ground and from aerial photographs. There are two major features, called the upper and lower ditches. Proceeding downstream to upstream, the upper ditch extends from the southeast corner of section 18, through the northeast quarter of section 19, and down through the southwest quarter of section 20, where it emerges from the lower ditch. The lower ditch serves an area from the south-central part of section 12, through the northeast quarter of section 13, and the southwest corner of section 18. It nearly bisects section 19 from the northwest corner to the southeast corner and meets the upper ditch along the south line of section 20. Above the point where the two ditches diverge, the channel runs one-half to three-quarters of a mile to near Las Huertas Creek.

There are two ponds at the location where the channel originally emerged from Las Huertas Creek. Site PL 3A (Appendix 13-5) is located just north of the point where the ditches diverge. Recent dirt roads parallel all of the upper ditch and about half of the lower ditch. These ditches are probably associated with large-scale com-



Map 13-1. The ditch system at Site PL 25A. Scale is 1:24000.

mercial farming which took place in the vicinity of PL 3A. (Side ditches mapped during the survey are shown in Map 13-2.) The latter site was constructed by Mariano Otero of Bernalillo for his workers who operated the farm during the late nineteenth century (see Placitas Historic Sites: Conclusions, below). Date Range: probably about 1880s (Scurlock 1983).



Map 13-2. Some side ditches of Site PL 25A (drawn by John Hayden).

Site PL 26A

Elevation: 5600 feet Topography: hillslope. Vegetation: juniper, native grasses. Site Description: This site consists of 20th century ceramics and one chert flake. Also noted is an ovoid arrangement of large rocks about five by ten feet long. The surveyors suggested that this feature, if not recent, may be Apachean, based on the wickiup-like arrangement of the rocks. Artifact Analysis: One unglazed earthenware sherd was collected. The surveyors noted that the sherd appeared to be from a flower pot. Date Range: not known.

Site PL 27A

Elevation: 5570 feet Topography: Mesa. Vegetation: juniper association. Site Description: The site consists of two lithic items and approximately 75 sherds of Carnue Plain. This is most likely a pot drop since no structural remains were found. Date Range: 1690 to 1900 A.D., based on ceramics.

Site PL 31A

Elevation: 5280 feet Topography: alluvial valley. Vegetation: juniper association. Site Description: A segment of an irrigation ditch curving around the base of a hill. The ditch is lined with large rocks on both sides and it extends to PL 32A. Artifact Analyses: One horseshoe and a rectangular tin can were collected. Date Range: not known.

Site PL 37A

Elevation: 5320 feet Topography: bench. Vegetation: juniper association. Site Description: This site is a trail that extends from the valley floor to the bluff top. A ceramic scatter was recorded on or near the trail, the ceramics consisting of 14 Carnue Plain sherds and 35 Puname sherds. It is possible that the sherds and the trail are not associated. However, the trail is the best access to the top of the bluff, and so may have been in use for a long time. Date Range: 1680-1900 A.D., based on ceramics.

Site PL 40A

Elevation: 5440 feet Topography: erosional slope. Vegetation: pinyon, juniper. Site Description: One historic artifact, a dog collar embossed with the following:

FROMM
No. 314743
Rabies
Vaccine
1973

was collected from this prehistoric site. Date Range: 1973.

Site PL 42A

Elevation: 5300 feet Topography: hill slope. Vegetation: juniper association. Site Description: Foot trail from Las Huertas Creek to the bluff top. No artifacts were noted along the hill. Date Range: not known.

Site PL 45A

Elevation: 5300 feet Topography: hill slope. Vegetation: juniper association. Site Description: Foot trail from Las Huertas Creek to the bluff top. No artifacts were noted along the hill. Date Range: not known.

Site PL 46A

Elevation: 5360 feet Topography: hill slope. Vegetation: juniper association. Site Description: Foot trail from valley bottom to bluff top. No artifacts were noted along the trail. Date Range: not known.

Site PL 48A

Elevation: 5240 feet Topography: alluvial valley. Vegetation: juniper association. Site Description: A rock alignment along a slight linear depression indicates a short segment of a possible road in the valley bottom. No artifacts were noted along the alignment. Date Range: not known.

Site PL 49A

Elevation: 5240 feet Topography: alluvial valley. Vegetation: juniper. Site Description: The site consists of four piles of rocks marking the corners of a possible corral. No other materials are present. The estimated enclosed area is 45 square feet Date Range: not known.

Site PL 78A

Elevation: 5420 feet Topography: ridge. Vegetation: juniper association. Site Description: A road extends from the Las Huertas drainage in Section 24 southwest over a ridge in Section 23. The linear depression is lined on both sides with trees. The road does not reach a specific destination, such as a homestead. No artifacts were noted along the alignment. Date Range: not known.

Site PL 80A

Elevation: 5600 feet Topography: caprock of a ri
Vegetation: native grasses. Site Description: The
consists of a rock with a possible brand or other de
scratched into it. Date Range: not known.

Site PL 81A

Elevation: 5400 feet Topography: hills. Vegetat
juniper association. Site Description: Foot trail fro
bench above Las Huertas Creek to the bluff top. Artif
listed as collected on the site form were not located in
lab. Date Range: not known.

Site PL 85A

Elevation: 5320 feet Topography: alluvial valley. Veg
tion: juniper associations. Site Description: A five-
segment of barbed wire fence line was located acros
arroyo. Artifact Analysis: The barbed wire type, know
Curtis Four Point, was patented on March 23, 1
(Glover 1975: Example #366). Date Range: post-18

Site PL 89A

Elevation: 5440 feet Topography: saddle. Vegetat
juniper association. Site Description: This multi-com
nent site contains a large lithic scatter, one prehist
sherd, and three fragments of amethyst-colored bo
glass. A road (PL 78A) bisects the northwest corner of
site. The bottle glass may be associated with the ro
Artifact Analyses: Three fragments of amethyst-colo
bottle glass, possibly from the same container. D
Range: 1880 to 1925 (Newman 1970:70-74).

Site PL 118A

Elevation: 5485 feet Topography: hill. Vegetation: p
yon, juniper, grasses. Site Description: This is a proba
multi-component site, consisting of a small lithic sca
and a recently-used hearth. The rock-lined hea
contains large pieces of surficial charcoal. No sample
the charcoal were taken and no historic artifacts w
recorded in the vicinity. Date Range: not known.

Site PL 121A

Elevation: 5530 feet Topography: mesa top. Vegetat
pinyon, juniper, native grasses. Site Description:
site consists of a rock cairn, with the following ma
pecked onto several of the rocks: "F G," "1940" an
possible brand symbol. Date Range: 1940.

Site PL 123A

Elevation: 5560 feet Topography: mesa top. Vegetation: pinyon, juniper, native grasses. Site Description: This is a multi-component site, consisting of a small lithic scatter and the probable date "1941" pecked onto the face of a boulder. Date Range: 1941.

Site PL 131A

Elevation: 5200 feet Topography: alluvial valley. Vegetation: juniper association. Site Description: The trash scatter is a composite of food cans, tobacco tins, a stove pipe collar and part of a parlor stove top. Artifact Analyses: One pocket-style tobacco tin and a parlor stove fragment ornamented with an intricate floral design were collected. A small portion of the stove's embossed nameplate, reading "SN 30 1/2" is still visible. Date Range: post-1913 (Music 1971:54).

Site PL 9B

Elevation: 5380 feet Topography: ridge. Vegetation: pinyon, juniper, native grasses. Site Description: This is a multi-component site consisting of a lithic, ceramic and glass scatter. The dimensions of the artifact scatter were not noted by the surveyors. Artifact Analysis: One amber-colored bottle fragment was collected. This fragment is probably from a beer bottle and was broken just below the lip, making it impossible to tell whether the finish was applied by hand or by machine. Date Range: 1880 to present (Ward et al. 1977:240).

Site PL 17B

Elevation: 5420 feet Topography: ridge. Vegetation: juniper association. Site Description: Several discrete localities were mapped for this site. Subsite A contains a possible mano and a ceramic scatter. Eight sherds of Puname sandstone temper were collected. Subsite B includes a possible structure composed of local cobbles. Subsite C appears to be a core reduction area, and Subsite D is a concentration of chert and quartzite lithic materials. Date Range: 1680 to 1900 A.D., based on ceramics.

Site PL 25B

Elevation: 5440 feet Topography: foot slope above arroyo. Vegetation: juniper association. Site Description: This multi-component site contains a lithic scatter, one prehistoric ceramic and bottle glass fragments. The bottle glass was located near the edge of the site. Artifact Analyses: Eleven pieces of glass were collected. Nine pieces are aquamarine in color and two are amber. The amber fragments include an applied brandy finish on a machine-made bottle. Date Range: 1880 to-1903 (Lorrain 1968:44).

Site PL 35B

Elevation: 5400 feet Topography: floodplain. Vegetation: juniper association. Site Description: This site includes a highly eroded cobble-outlined room on a floodplain overlooking a creek. The rock alignment appears to be subject to periodic flooding. Artifacts include an obsidian projectile point tip, an obsidian scraper and flakes of obsidian and chert. One Kapo Black sherd was collected. Date Range: 1700 to 1900+, based on ceramics.

Site PL 40B

Elevation: 5400 feet Topography: floodplain. Vegetation: juniper association. Site Description: The site map shows a rock concentration inside a circular area cleared of vegetation. A second rock alignment may be a structure. The cobble feature overlooks Las Huertas Creek. Artifacts include a lithic scatter of chert, obsidian and basalt. Two possible groundstone pieces were noted on the site map. Ceramics include Carnue Plain, Casitas Red and an unpolished plainware. Date Range: 1690 to 1900 A.D., based on ceramics.

Site PL 45B

Elevation: 5440 feet Topography: floodplain. Vegetation: juniper association. Site Description: The site consists of two cobble structures several meters apart. The southernmost feature is better stabilized but has fewer artifacts associated with it. This site, and PL 46B nearby to the south, overlook Las Huertas Creek. Artifacts include two manos and a metate, chert and obsidian flakes. There are also ceramics of the following types: Puname Polychrome, Casitas Red-on-Brown, Casitas Red, Casitas Plain, Carnue Plain, a fragment of a polished plainware and several unidentifiable sherds. Thirty-six glass fragments were collected, representing from two to four bottles of a later occupation. No maker's marks were evident. One fragment may have been used as a scraper. Date Range: 1680 to 1900 A.D., based on ceramics; 1880 to present, based on glass (Ward et al. 1977:240).

Site PL 57B

Elevation: 5400 feet Topography: flood plain. Vegetation: juniper. Site Description: The site consists of a three to four room structure built of local cobbles. The site has been disturbed by the construction of a gas pipeline. Several similar structures have been recorded along Las Huertas Creek. The artifact scatter is extensive and includes numerous flakes of basalt, obsidian and chert. Four manos were discovered, but no metates. Collected ceramic types are as shown in Table 13-1.

Table 13-1. Ceramics Collected at PL 57B.

Ceramic Type	Date Range	N
Cieneguilla G-P	1325-1425	17
Red, body sherd, glaze		22
G/w body sherd		6
Undetermined glaze		2
G/yellow		3
Yellow, body sherd		1
Cream yellow, red exterior (San Clemente)		10
G/pink & red matte		2
Pink, body sherd		3
Agua Fria	1315-1425	5
G-P, red & pink surfaces		3
G/r body sherd		2
Intermediate G-P	1425-1500	10
G/r white		27
Carnuel (Carnue) Plain	1690-1900	11
Undetermined B/r		10

One fragment of yellow-amber bottle glass was also collected. Date Range: see ceramic list; also 1914 to 1930 (Kendrick 1971:59).

Site PL 59B

Elevation: 5500 feet Topography: lower bajada. Vegetation: juniper. Site Description: One fragment of aquamarine bottle glass was located near a possible surveyor's stone that had the inscription "D19" carved onto the north side. The remains of plastic from an aerial photography crossmark were also present. Date Range: 1880 to present.

Site PL 71B

Elevation: 5560 feet Topography: alluvial fan of an intermittent stream. Vegetation: juniper. Site Description: This is a multi-component site consisting of a sm lithic scatter and one piece of amber bottle glass. Artif Analysis: The bottle fragment is a body fragment with evidence of a maker's mark or bottle type. Date Ran 1880 to present (Ward et al. 1977:240).

Site PL 72B

Elevation: 5600 feet Topography: fan. Vegetation: p yon, juniper, native grasses. Site Description: This s consists of a lithic scatter and a metal dog tag with t dog's name, owner's address, and phone number stamp on it. Date Range: not known.

Site PL 73B

Elevation: 5600 feet Topography: ridge. Vegetati pinyon, juniper, native grasses. Site Description: T site consists of three rocks spaced about 15 to 25 f apart and painted with the following inscriptions: Rc #1 — "J A"; Rock #2 — "P N"; Rock #3 — a reversed ". Date Range: not known.

Site PL 74B

Elevation: 5600 feet Topography: ridge. Vegetati juniper association. Site Description: This site consi of a few cores and unworked flakes of chert, as well several fragments of Casitas Red-on-brown pottery. T absence of other ceramic types suggests a pot drop. D Range: 1690 to 1900 A.D.

Site PL 75B

Elevation: 5500 feet Topography: fan. Vegetation: p yon, juniper, native grasses. Site Description: The s consists of a design or possible brand pecked onto a ro Date Range: not known.

Site PL 78B

Elevation: 5520 feet Topography: fan. Vegetation: p yon, juniper, native grasses. Site Description: The s consists of a rock having a design or brand pecked o its surface. Date Range: not known.

Site PL 80B

Elevation: 5600 feet Topography: ridge. Vegetati juniper. Site Description: The site contains a large r with a possible brand or figure etched on it. Date Ran not known.

Site PL 86B

Elevation: 5400 feet Topography: canyon rim. Vegetation: native grasses. Site Description: The site consists of a cairn situated on a dirt mound, the latter on a promontory overlooking the confluence of two intermittent streams. One of the stones that make up the cairn has the initials "H B" pecked onto it. No artifacts were noted. Date Range: not known.

Site PL 90B

Elevation: 5582 feet Topography: ridge. Vegetation: juniper associations. Site Description: The site includes a small lithic scatter and a rock near the northeastern edge of the lithic scatter with the marking "ED" etched on it. No historic artifacts were observed. Date Range: not known.

Ball Ranch Historic Sites

All of the sites within the Ball Ranch survey boundary are located in Sandoval County. The sites were plotted on the San Felipe Pueblo Northeast 7.5 minute topographic map and the Madrid 15 minute topographic map.

Site BA 11C (LA 33813)

Elevation: 5920 feet Topography: broad ridge top, the ridge adjacent to a series of drainages and a low, wooded rise. Vegetation: juniper, cholla, yucca, native grasses. Site Description: This is a multi-component site consisting of a prehistoric Puebloan structure and associated features, in addition to a historic, rock-delineated hearth with an apparent associated artifact scatter. Artifact Analyses: Three cans and two fragments of dinnerware were collected from the artifact scatter adjacent to the hearth. Two of the cans are sardine-style containers with seams and lid sealed with solder. The third can would have contained approximately one pound of food (#303 size can) and has a crimped sanitary-style seam. The two fragments of whiteware are too small to determine vessel function. Date Range: 1900 to 1920, based on the presence of both solder and crimped can seams (Fontana et al. 1962:73).

Site BA 1C (LA 33803)

Elevation: 5680 feet Topography: lower bajada. Vegetation: pinyon-juniper. Site Description: The site consists of several juniper sticks embedded in the ground, approximately two to three meters apart, and overlain with juniper limbs wired to these "posts" to form an erosion barrier. The feature is presently working, but it is only a matter of time before heavy water flow will undercut it. Date Range: not known.

Site BA 3H (LA 33767)

Elevation: 6220 feet Topography: on a ridge slope-alluvial bench interface. Site Description: This site consists of prehistoric Puebloan features and artifacts and a wooden barbed wire roll. The wooden roll was collected as an isolated occurrence. Date Range: not known.

Site BA 12H (LA 33776)

Elevation: 6034 feet Topography: on a flat crest of a ridge, adjacent to both an access road and the fence line that demarcates Section 30 from the Ortiz Mine Grant. Vegetation: juniper, cholla, yucca and grasses. Site Description: The site consists of two sandstone rocks whose shapes have been modified and their surfaces inscribed. The rocks apparently represent boundary markers. One of the rock markers is roughly trapezoidal, standing two feet high and 0.6 feet wide at its base. It has the initials "R.P." inscribed onto the flat surface of its top. The other marker, located about 50 feet to the southwest, is similar in shape but its top portion is broken off and the base is ringed with rocks. This marker is inscribed with the letters "R.P.," "N.W.C.," and "C.C.R." Date Range: The markers probably indicate the boundary of the Ortiz Mine Grant, a mine claim registered in 1833; but, none of the above-described initials matches the names of the mine claimants (Pearce 1965:114).

Site BA 17M (LA 33859)

Elevation: 5900 feet Topography: gently sloping rise above a major wash, road and stock tank to the northeast. Vegetation: native grasses and snakeweed. Site Description: The site consists of a stone foundation for a two-room structure. The probable doorway into the larger southern room faces east. Wood fragments suggest a wooden superstructure. Corrugated metal roofing was found about 80 feet to the north. Artifact Analyses: Collected items include: two dinnerware sherds, two white buttons, a garter snap, four wire nails of various sizes, three bottle fragments and one complete bottle. The whole bottle has chamfered corners and was molded by the "Owens-Bottle Co." between 1911 and 1929 (Toulouse 1972:393). One of the bottle fragments has the embossed words "BLUE RIBBON". Toulouse notes that this bottle was made by the "Standard Glass Co." of Marion, Indiana between 1920 and 1925 (1972:484-485). The other bottle fragments appear to be from a ketchup bottle and an extract bottle. Conclusions: This structure may have been a homestead, or more likely a line camp for ranch hands. Date Range: 1900 to 930.

Site BA 20W (LA 33891)

Elevation: 5800 feet Topography: east-facing ridge slope, drainage at the base of the ridge. Vegetation: pinyon, juniper, native grasses. Site Description: This site consists of a possible pithouse depression with associated lithic artifacts and a tin-plated concho. Date Range: The concho is tentatively dated to the late 19th to early 20th centuries, based on its similarity to those seen in historic museums.

Site BA 25W (LA 33896)

Elevation: 5858 feet Topography: ridge crest. Vegetation: juniper, yucca, cholla, grasses. Site Description: This site is multi-component and consists of a lithic scatter, a cobble feature and several historic artifacts. The cobble feature is not a habitation-type structure but rather a roughly rectilinear, three by six feet concentration of cobbles. It is possibly a grave or an elongated cairn. A fragment of glass and a rifle shell were collected from the surface of the cobble feature. Artifact Analyses: The glass fragment is window glass. The rifle shell is a 30-06 WW "Super Springfield." Date Range: post-1903 (Barnes 1972:38).

Placitas Isolated Finds

PL IF 1A

Description: This hole-in-top soldered tin can was not collected. Date Range: pre-1900 (Cobb 1914:94).

PL IF 8A

Description: Thirty-three bottle glass fragments, all of them purpled. The fragments are apparently from the same bottle, which had a brandy-style finish. Date Range: 1880 to 1925 (Newman 1970:70-74).

PL IF 10A

Description: A hole-in-top condensed milk can, its size indicating that it was manufactured prior to 1932 (Fontana 1962:75). Date Range: pre-1932.

PL IF 16A

Description: This purpled bottle base fragment is embossed with either the number "6" or "9." Date Range: 1880 to 1925 (Newman 1970:70-74).

PL IF 17A

Description: Three pieces of clear bottle glass. One bottle base displays the "Hazel-Atlas Glass Co." mark (Toulouse 1972:239). Date Range: 1920 to 1964.

PL IF 24A

Description: Forty-nine fragments of amber-colored bottle glass. The fragments are from a bottle that had a brandy-type finish. Date Range: 1880 to present (Ward et al. 1977:240).

PL IF 25A

Description: Two fragments of a dark green bottle. This color of bottle glass was usually used for wine bottles. Date Range: pre-1885 (Newman 1970:70-75).

PL IF 29A

Description: One fragment of dark green bottle glass. This color of bottle glass usually denotes a wine bottle. Date Range: pre-1885 (Newman 1970:70-75).

PL IF 36A

Description: Eight fragments of purpled bottle glass. Several pieces of one bottle base were reconstructed, but the only embossed mark was the number "8." Shape and types of fragments suggest that this was a round or ovoid bottle with a square or possibly rectangular base, although more than one bottle may be represented. Date Range: 1880 to 1925 (Newman 1970:70-75).

PL IF 43A

Description: A partially buried, shaped masonry block within an irrigation ditch (PL 25A). The block was not collected. Date Range: not known.

PL IF 45A

Description: Six fragments of yellow-amber glass. Date Range: 1914 to 1930 (Kendrick 1971:59).

PL IF 90A

Description: This is a bottle base fragment with a portion of an embossed maker's mark; however, a source for the mark was not located. Date Range: not known.

PL IF 6B

Description: Six fragments of patinated clear glass. These were reconstructed to form a nearly complete bottle. The container appears to be a liquor bottle with the words "FULL QUART" embossed on the side. Date Range: not known.

PL IF 21B

Description: Two small sherds of glazed dinnerware. One sherd has a floral pattern but neither sherd displays a maker's mark. Date Range: not known.

Ball Ranch Isolated Finds

BA IF 6H

Description: One aquamarine bottle fragment. Date Range: 1880 to 1910 (Ward et al. 1977:240).

BA IF 7H

Description: One purpled bottle base fragment. Date Range: 1880 to 1925 (Newman 1970:70-75).

BA IF 24H

Description: One large tin can opened with a knife and one small condensed milk can with a knife-punctured opening. Also present but not collected was a prehistoric Puebloan sherd. Date Range: pre-1932, based on condensed milk can (Fontana et al. 1962: 75).

BA IF 26H

Description: One pound, key-opened coffee can. Date Range: post-1928 (Ward. et al. 1977:240).

BA IF 28H

Description: "K C Baking Powder" can lid. Date Range: 1934 to 1935 (Ward et al. 1977:240).

BA IF 41H

Description: One gallon-size lard bucket. Date Range: not known.

BA IF 46H

Description: Large lard can, embossed with the label "ARMOUR PACKING CO. LARD COMPOUND, KANSAS CITY, MO.". The can was re-utilized as a type of bell or rattle, made by placing stones within the can and crushing shut the opening. This type of artifact is normally used by tying the modified can around the neck of the lead sheep in a herd. Date Range: not known.

BA IF 56H

Description: Purpled brandy-finish bottle neck fragment. Date Range: 1880 to 1925 (Newman 1970:70-75).

BA IF 76H

Description: Sanitary-style tin reused as a bell or rattle; modification similar to BA IF 46H. Date Range: post-1902 (Fontana et al. 1962:73).

BA IF 78H

Description: Two bottle body fragments, possibly from the same bottle. Date Range: not known.

BA IF 81H

Description: Two cans re-utilized as sifters. One can is a "K C BAKING POWDER" tin, the other has the manufacturer's mark "CANCO" stamped onto the can's base. Date Range: 1937 "K C BAKING POWDER" can (Ward et al. 1977:240).

BA IF 83H

Description: This "K C BAKING POWDER" can has the manufacturer's mark "G" (General Can Co.) stamped onto the container's base. The can lid has two punched holes. The function of this can modification is not evident. Date Range: 1928 TO 1929 "K C BAKING POWDER" can (Ward et al. 1977:240).

BA IF 84H

Description: One pocket-style tobacco tin with hinged top. Date Range: post-1913 (Rock 1978).

BA IF 93H

Description: Screw top with wire handle. The top shows the stamped name of the product: "PRISE BAKING POWDER." Date Range: not known.

BA IF 10C

Description: Two dinnerware rim fragments of whiteware. Date Range: not known.

BA IF 14C

Description: Wine bottle base. Date Range: not known (it is difficult to date early wine bottles as they were usually not embossed but identified with paper labels).

BA IF 16C

Description: Artifact #1: bottle base fragment with maker's mark for the "Streator Bottle & Glass Co.," Streator, Ill. Date: 1881 to 1905 (Toulouse 1971:461). Artifact #2: purpled prescription bottle - finish fragment. Date: 1880 to 1925 (Newman 1970:70-74). Artifact #3: ceramic fragment, possibly part of same vessel as Artifact #4. Artifact #4: whiteware dinnerware fragment with partial maker's mark for Goodwin Brothers: "LIVERPOOL, OHIO, USA. JOHN GOODWIN. PRINTED. EST. 1844." Date Range: 1880s to 1920s (Kovel and Kovel 1974:175).

BA IF 27C

Description: Six purpled bottle fragments of a possible medicine bottle. The fragments were reconstructed. Date Range: 1880 to 1925 (Newman 1970:70-75).

BA IF 29C

Description: Iron metal fragment of unknown function. Date Range: not known.

BA IF 50C

Description: "K C BAKING POWDER" can lid. Date Range: The embossing on the lid reads: "SAME PRICE TO-DAY AS 47 YEARS AGO"; probable date is about 1938 (Ward et al. 1977).

BA IF 54C

Description: Food can that has been modified into a sheep rattle. The "General Can Co." maker's mark "G" is embossed on the base of the can. Date Range: not known.

BA IF 55C

Description: A rock cairn, possibly used as a 1/4 secti marker in Section 26. Date Range: not known.

BA IF 74C

Description: Rock cairn, possibly representing the nor east section corner marker of Section 35. Date Ran : not known.

BA IF 82C

Description: Whole "Coca-Cola" bottle from the Alt querque, New Mexico bottling plant. Date Ran : trademark date patent "Dec. 25, 1923."

Placitas Historic Sites: Conclusions

The Elena Gallegos-Placitas Tract survey has contr uted to the corpus of known historic sites within the L Huertas Valley. The recorded habitation loci, in assoc tion with the agricultural and livestock-oriented faciliti are especially informative as to modes of subsistence th the Las Huertas Valley settlers practiced during t eighteenth and nineteenth centuries.

Three of the four structural sites were apparently occ pied during the Colonial, Mexican and/or Territor periods. This is based on the utility ware sherds found the surface: Puname sherds (1740 to 1850) from PL 17 Kapo Black sherds (1760 to 1900) from PL 35B; a Carnue Plain (1680 to 1900) and Casitas Red sher (1690 to 1900) from PL 40B. These same ceramic typ are also represented at the Hispanic village site of L Huertas (LA 25674), as well as at two Hispanic *ranchos* homesteads: LA 44534, an eight-room structure whi has been dated to the seventeenth and eighteenth cent ries (Scurlock 1983:21); and LA 8671 (the Ideal Site) four-room structure dating to about 1820 to 1860 (Bro and Colberg 1966:19, 20).

The three small structural sites are situated within 3 kilometers (two miles) of the village and the two ranch This close spatial relationship, in conjunction with commonality in utility-ware sherds and the fact that 17B, PL 35B and PL 40B are within the Las Huert Grant, allows the conclusion that these sites were u lized by Hispanic peoples. There is no definite eviden of a resident historic Puebloan or nomadic Indian pop lation within the survey area, although this does n preclude the possibility of the employment or servitude individual native Americans at any of the historic site

The fourth structural site, PL 45B, contains sherds of Puname Polychrome, Casitas Red and Carnue Plain, sherds common to the Colonial, Mexican and early Territorial sites within the valley. However, PL 45B also possessed two amber bottle glass fragments which were modified by flaking and then utilized as scrapers. Since amber-colored bottles were first manufactured about 1880 (Ward et al. 1977:240), it is apparent that this site was occupied toward the end of the nineteenth century.

The glass scrapers are also significant in that they indicate a continuance of an Hispanic frontier tradition of manufacturing expedient cutting tools. Flaked lithic tools and debitage were found at PL 17B, PL 35B and PL 40B. In addition, the eighteenth century house excavated within the Las Huertas Village site (LA 25674) produced 26 flakes. The assemblage as a whole gave the impression that the knapper(s) was not skilled at flaking stone, or rarely did it (Ferg 1984:61). Although some metal artifacts were found at the Ideal Site and at the village of Las Huertas, the presence of lithics at these sites underscores the scarcity of metal within the Las Huertas Grant. Indeed, the pervasive use of lithics concomitant with the scarcity of metal is a common artifact trait on the New Mexican Colonial frontier (cf. Haecker 1976; Snow 1979; Marshall and Walt 1984).

The ceramic assemblages derived from the Las Huertas Grant Hispanic sites reflect the strong economic ties that the settlers held with the Pueblo Indians. Historical accounts likewise support this conclusion. Batchen (1972:18, 43) notes that the Las Huertas settlers traded almost exclusively with San Felipe Pueblo, located approximately 15 kilometers (9.4 miles) to the north of Las Huertas. Yet the most common ceramic type recovered from the house excavated within Las Huertas is a Carnue Plain manufactured at Santa Ana Pueblo. This is followed by lesser amounts from the Tewa Pueblos north of Santa Fe and Zia Pueblo. Santa Ana pottery is also the most common decorated type found at Las Huertas, probably because Santa Ana potters were the major pottery producers closest to Las Huertas, having settled at the relatively recent settlement of Ranchitos located 11.2 kilometers (seven miles) away on the Rio Grande (Ferg 1984:33, 34).

It is possible that some of the unidentified ceramics recovered from Las Huertas originated from nearby San Felipe Pueblo but, to date, virtually nothing is known concerning the type(s) of utility wares manufactured by the San Felipe Indians during the eighteenth and nineteenth centuries. Bandelier (Lange et al. 1975:68) wrote in 1885 that "[the San Felipe Indians] make no pottery themselves." It is, therefore, likely that San Felipe Pueblo acted as a trade center for the Las Huertas settlers and various pueblos to the north and west that manufactured pottery.

If the Las Huertas settlers were participating in a regional trade network, it raises the question of what they were producing as a surplus for trade. Almost certainly sheep were used as a medium of exchange. Historical documents indicate that the system of *partidario* was evidently practiced within the Las Huertas Land grant. In this agreement an individual tended a specified number of livestock for a stock owner at a specific rate of return for both parties. This system was responsible for producing virtually the only source of meaningful income in northern New Mexico during the eighteenth and nineteenth centuries (Smith 1973).

Another trade item could have been woven goods from surplus wool. LA 44534, the previously mentioned rancho, contained a relatively large number of sherds that were reshaped into spindle whorls. This indicates that weaving was an important "cottage industry" there (Scurlock 1983:39).

The name Las Huertas ("the gardens") reflects the high degree of agricultural development within the valley, at least since the seventeenth century when Hispanic settlers first occupied it. Marshall, Akins and Winter (1986:155) suggest that this extensive Hispanic irrigation system owes its beginnings to the Puebloan Indians during the fifteenth century. Whatever the period of origin, by the mid-nineteenth century there existed two major irrigation systems. PL 25A and PL 31A are two minor ditches which are laterals off of the main ditches. To date, the complex of the major and lateral ditches and terrace gardens within the valley has not been entirely defined. It is probable that dry farming also was conducted in the bottomlands and benches bordering Las Huertas Creek. Such dry farming was conducted by the Hispanic settlers within the Chama Valley and around the village of Abiquiu (C. Carillo, personal communication, 1987).

However, there is no record of the Las Huertas settlers having significant surpluses of agricultural produce which could have been used as a major commodity for trade. It is likely that most of their surplus produce was preserved and stored for use within the Grant, the surpluses needed as a hedge against periodic droughts, floods and raids by nomadic Indians.

Both the animal husbandry and agricultural economies of the Las Huertas grant settlers would have required the use of storage and seasonal habitation facilities, situated adjacent to agricultural fields and pastures. Such facilities have been identified within the Chama Valley and around the village of Abiquiu through the research of ethnohistorian Charles Carillo, and are described as follows.

Garden produce and farming implements were stored in a small structure called a *fuerte*, usually located on the edge of a garden. Food processing, such as grinding corn, sometimes took place here as well. The *fuerte* was constructed of horizontal interlocking logs on a cobble foundation. Hay, alfalfa and corn husks were piled on a raised, wooden platform called a *tapeiste*; the underside served as a shelter for animals. Hay and straw were stored under an open-sided, roofed structure similar to a barn, called a *tasoleras*.

According to Carillo's informants, sheep camps were established in upland pastures and utilized during the spring and summer months. The structures were usually placed where there was water, with secondary consideration given to the protection of the shepherd from adverse weather conditions. The typical shepherd's hut was of jacal construction in the more mountainous regions, but was otherwise built of adobe and rocks. Archeologically, the adobe structures are identified by their cobble foundations, while jacal structures can be recognized by their lack of formal foundations and by the use of corner support posts. The typical shepherd's hut measured about six feet long, four to six feet wide, and four to five feet high.

Usually a family possessed two or more such structures in various locations, with their occupancy seasonal and intermittent, depending on the frequency of Indian raids. Sometimes limited agricultural activity was also conducted in the vicinity of the sheep camps by the herders' families (C. Carillo, personal communication, 1987).

Similar agricultural and livestock-related structures are probably represented by the four small Hispanic structural sites recorded within the study area. PL 17B is situated on a bench of an upland mesa slope some 0.6 kilometers (0.4 miles) away from the closest arable land, suggesting that this site was a shepherd's spring/summer camp. The structural remains of PL 17B may be that of a jacal. It consists of three pairs of cobble piles, each pile perhaps once functioning as the base support of a structural post long since rotted away or removed.

The other three structural sites, PL 35B, PL 40B and PL 45B, are located adjacent to the arable bottomland of Las Huertas Creek. This placement would be typical of the previously described *fuerte*. The structural remains on these sites are limited to rectilinear arrangements of cobbles, plausibly the foundations for the now-absent horizontal log or adobe wall construction described by Carillo's informants. It is also likely that these structures were occasionally utilized as shelters by shepherds and hunters. Such was the case in the Chama and Abiquiu regions where the various huts and sheds were available to all community members as needed.

Approximately half of the historic sites recorded wit n the study area cannot be assigned to a specific peri l. Many are petroglyphs of circumscribed crosses, bra s and initials. Such petroglyphs are found in other pa s of New Mexico as well. It is likely that such cry c cultural remains are examples of individual self expr sion created by those involved in livestock-related ta s in isolated areas.

The archeological and historical records of the Las Hue s Valley indicate that the nineteenth and early twenti h century inhabitants were practicing a lifeway that d changed relatively little since the Colonial period. e one major exception would be the shift in settlem t pattern from that of the settlers living in the fort d (walled) village of Las Huertas before 1823, to that of e dispersed village of Placitas and the appearance of e isolated farm and ranch houses. This could only h e occurred after the threat of Indian attacks was remo d by the 1860s.

One such farm house is PL 3A, a four-room struct e constructed by Mariano Otero, a well-known busine man and politician who resided in Bernalillo in the l e nineteenth century. Employees of Otero lived in s house while they were involved in a large-scale comm cial attempt to grow crops to the west of the site. Wa r was carried to the plots by a ditch (PL 25A) which tied o the ditches at San Jose (Scurlock 1983:27). It is lik y that the encampments of PL 118A and PL 131A e associated with the livestock-related activities wh h continued within the study area during the first w decades of the twentieth century. There are no data e sites that indicate significant use of the study area p t the 1930s. This negative information corresponds w h the history of Placitas and its envisions: the young n n have been leaving the area for better-paying jobs n Albuquerque.

Atrisco Tract

Area History

The 1,800-acre Atrisco Tract is within the geographic ly and politically defined Middle Rio Puerco Valley. T is region is more or less arbitrarily demarcated by e confluence of the Rio Puerco and the Rio San Jose at s southern end, and at its northern end by the town of Cuba (Widdison 1958). This middle segment of the o Puerco Valley encompasses approximately 200,000 ac s of river channel and floodplain, terraces and mesas. e following historical overview will be that of the en e Middle Rio Puerco Valley, with the not unreasona le assumption that the history of the Atrisco tract playec n integral part in the valley's history. This assumption is supported in part by the tract's historical remains, but largely by its environmentally deteriorated condition due to recent historical developments.

The Middle Rio Puerco Valley was first viewed by the Spanish in 1540, when Coronado's expedition marched north from Mexico. This expedition entered the present area of New Mexico from the west and traveled eastward to the Rio Grande Valley, crossing the Middle Rio Puerco Valley in the line of march. Accounts of Coronado's explorations, however, make very little mention of the Puerco, so apparently the valley was neither inviting nor impressive (Bolton 1949). Other Spanish expeditions of the sixteenth, seventeenth and early eighteenth centuries would have crossed the Rio Puerco but, like that of Coronado's party, their accounts make little or no mention of the river (Bolton 1949; Bailey 1940).

During these centuries, the Rio Grande Valley was settled and made the heart of Spanish New Mexico, but the occupation was a slow process. The Rio Puerco Valley, though known and explored, was not settled by the Spanish. A few people from the Rio Grande settlements may have entered the valley occasionally to gather firewood, or else used the Puerco as a watering stop on travel between the Rio Grande Valley and the Indian pueblos further west. Hostile bands of Navajos prevented the Spanish from considering the Rio Puerco Valley as a potential area for settlement.

However, despite the Indian dangers, during the mid-eighteenth century a few Spanish villages were established within the Middle Rio Puerco Valley. This portion of the valley was chosen since there existed adequate rangeland as well as a place where crops could be grown. The first land grant within the valley was made in 1753, called the Bernabe Montaño Grant, located to the northwest of Albuquerque. Soon after it was given, 12 families settled on the land (Twitchell 1914:92). The 1,800 acre Atrisco tract lies partly within the Bernabe Montaño Grant and partly within the original boundaries of the adjoining Atrisco Grant. The Atrisco Grant was created in 1768 in order to provide adequate grazing and firewood-collecting lands for the villagers of Atrisco (Bowden 1969:1969). Today the village of Atrisco is a section of southwest Albuquerque (Pearce 1965:11, 12).

Several small villages were established within the Middle Rio Puerco Valley between 1753 and 1760. Though few in number, the villages were widely scattered. The one furthest south, Los Quelites, was located at the confluence of the San Jose and the Rio Puerco; the northernmost was in the vicinity of present-day Cuba. The greatest concentration of villages, a total of four, was situated within the Bernabe Montaño Grant, some 25 miles upstream from Los Quelites (Adams 1954:67).

The first period of Spanish-American settlement lasted from about 1753 to 1774, after which the valley was deserted by the settlers. It then remained unoccupied, except by the Navajo, until 1870. Attacks by the Navajo were the historical reason for the abandonment of the early settlements. The villages shown on a map of 1779 are indicated by a symbol meaning *arruinadas por los enemigo* - ruined by the enemies (Adams and Chavez 1956:218). But the abandonment actually occurred as a result of the Spanish placing a sedentary population within a harsh environment. Their enemy, the Navajo, could exploit the Puerco Valley only by staying nomadic and not attempting to modify or heavily exploit its fragile resources (Haecker 1976).

In 1846 the Mexican period came to an end in New Mexico. In order to learn more about their newly acquired territory, U.S. troops were sent out from the Rio Grande Valley to explore the outlying country. One of these military groups, under the command of Lieutenants Abert and Peck, traveled across the Rio Puerco Valley. Abert described the valley as wide and flat, with a few cottonwoods and salt cedars along the river bed. In his opinion the valley was suitable only for sheep and goats.

Abert's route to the Laguna area was one that followed an existing trail extending from Albuquerque in an almost due-west direction to the Rio Puerco. This "road" eventually became the route of U.S. Highway 66 and later Interstate 25. Abert's expedition did not find any inhabited villages within the Middle Rio Puerco Valley, nor did any later expeditions during the 1850s. During all this time, the valley held no Spanish settlements (Widdison 1958:60).

The Spanish-Americans began to resettle the Middle Rio Puerco Valley during the 1870s. Small farms and villages were again established along the floodplain of the Rio Puerco, usually in the same locations as the ones of the eighteenth century. It is likely that there were more settlers in the Middle Rio Puerco Valley during the nineteenth century than in the 1700s. As before, the lower valley, from the Rio San Jose to the Rio Grande, was unoccupied (Widdison 1958:62).

The second historic occupation of the Middle Rio Puerco Valley had profound adverse effects upon the environment. Unlike the initial eighteenth century settlers who were almost totally dependent on a subsistence economy, the settlers of the 1870s were more heavily dependent on raising livestock. This was necessary in order to participate in the cash economy that was introduced by the Anglos. The Rio Puerco settlers were participating in historical processes occurring throughout the Rio Grande Valley: the severe exploitation and depletion of the limited, fragile resources within the desert valleys.

By the 1880s the soil holding, palatable, perennial grasses were increasingly displaced by ring grass and snakeweed, and by annuals that did not provide adequate protection of the thin topsoil. By the 1900s the channel of the Middle Rio Puerco had become deeply entrenched, causing such a drop in the water table that wells dried up. It became almost impossible to irrigate the fields in and around the villages (Harper, Cordova and Oberg 1943:29-33).

Unlike the Hispanic villages in the Middle Rio Puerco valley, the Anglo homesteaders were primarily dry farmers and not irrigators. The homesteaders tended to disperse over the outlying ranges of the valley, usually near water holes, and away from the villages. It was the Anglo rancher and dry farmer who introduced the pumping of underground water, thereby exploiting those lands which were previously considered too marginal even for grazing. This exacerbated the deteriorated condition of the Middle Rio Puerco Valley (Haecker 1976:76).

Today the Middle Rio Puerco Valley is virtually uninhabited. Where once there were small Hispanic villages and irrigated fields, there is now a floodplain devoid of grass cover and dissected by deep arroyos. The Anglo homesteads are now marked by collapsed one-room adobes and windmills next to bone-dry cisterns.

Atrisco Historic Sites

All of the sites within the Atrisco survey boundary are located in Bernalillo County. The sites were plotted on the La Mesita Negra 7.5 minute topographic map.

Site AT 2B (LA 33901)

This site was relocated outside the survey boundary during the testing phase on unplatted lands of the Atrisco Grant. Elevation: 5270 feet Topography: plain. Vegetation: grasslands. Site Description: The site includes a water control dike, the remains of a cement block structure, a trash scatter associated with the structure and a lithic scatter. Artifact Analyses: Three bottle fragments were collected. Two fragments are bottle bases. One base is embossed with "R & Co." dated 1880 to 1900; however, the manufacturing company is unknown (Toulouse 1972:439). Another fragment is an amber bottle finish and may belong to the previously described bottle. The third fragment was made by the "A & DH Chambers Glass Company" of Pittsburgh, PA. The mark was used from 1843 to 1886, and possibly later (Toulouse 1972: 37). Date Range: 1880s to 1900s

Site AT 7B (LA 33907)

Elevation: 5260 feet Topography: on an open pl between an earthen dam to the east and the Rio Pue River to the west. Vegetation: native grasses, snakewe saltbush. Site Description: This is a multi-compon site consisting of a lithic scatter and a Historic Per trash scatter situated on the edge of the deeply channe Rio Puerco. The site has been affected by mechani operations causing artifacts to erode down the ri bank. The trash scatter extends over an area about by 10 feet.

Artifact Analyses: A total of 26 artifacts were collected a grab sample from the trash scatter. These artifa include: 22 dinnerware fragments, four whole bottles a six bottle fragments, three cans, and a 1935 New Mexi tax token. No definite dates could be assigned to t dinnerware fragments. Several patterns were collect but only three of the fragments possessed maker's mar Dates were not located for these marks. Most of the wh bottles and fragments collected date between about 19 and 1955. The artifact collection includes a bot embossed with "Dr. Kilmer's Swamp Root," which dat about 1905 to 1917 (Toulouse 1971:412). One of t collected cans is stamped "Armour Star Spiced Lunche Meat Estab. '26 Chicago Ill." The other two cans a condensed milk cans. Non-collected artifacts inclu buttons, rifle cartridges, chair parts and househol related objects.

Conclusions: The proximity of this site to LA 33901 (A 2B), a probable residence, would suggest that the tra scatter is associated with the latter site. Date Rang 1930 to 1955.

Site AT 8B (LA 33908)

Elevation: 5600 feet Topography: sand dunes, intermi tent streams. Vegetation: native grasses, snakewe Site Description: The survey field notes describe this si as a lithic scatter and do not mention historic artifact However, artifacts retrieved from the site include thr bottle glass fragments. Artifact Analyses: Three ambe colored glass fragments possibly from the same bottle. basal embossed maker's mark is incomplete; howeve the existing mark fragment has been identified as "A DH Chambers", Pittsburgh, PA, which dates to abo 1870 to 1880, when this company made beer bottl (Toulouse 1971:37). Date Range: about 1870 to 1880

Site AT 4C (LA 33916)

Elevation: 5410 feet. Topography: dunal ridge. Veget tion: native grasses. Site Description: This site is hearth with associated fire-cracked rock, lithics, and ceramics. It is classified as having a historic component since the "Other Metal" category was checked on the "Artifacts/Materials Collected" section of the site form. There is no description of the collected artifacts on the site form. Artifact Analyses: A fragment of belt leather and a metal belt buckle were collected. Date Range: not known.

Site AT 9C (LA 33921)

Elevation: 5400 feet Topography: dunal ridge, ranch house to the north. Vegetation: native grasses. Site Description: This site consists of a lithic and ceramic scatter and a belt buckle. Artifact Analysis: The buckle was from a woman's or child's belt. Date Range: not known.

Site AT 10C (LA 33922)

Elevation: 5400 feet Topography: small sandstone mesa surrounded by semi-stabilized dunes. Vegetation: none. Site Description: This site consists of several dates and names scratched onto the face of the mesita. The dates are 1931, 1934, 1935, 1941 and 1965.

Site AT 23C (LA 33935)

Elevation: 5460 feet Topography: bajada, semi-stabilized dunes. Vegetation: native grasses. Site Description: This site consists of a roughly 1.5 foot-diameter charcoal stain located in the middle of a two-track access road. Excavation of the stain produced a bone fragment (species unknown) and a shotgun shell brass casing containing fragments of paper casing. The shotgun shell was collected but was not located at the time of artifact analysis. Date Range: not known.

Site AT 26C (LA 33938)

Elevation: 5300 feet Topography: broad terrace to the east of the entrenched Rio Puerco; about 100 feet east of an access road. Vegetation: native grasses, snakeweed. Site Description: This is a small trash scatter consisting of household-related articles: bottle glass, crimped-seam food cans, condensed milk cans, church key-opened beverage cans and window glass. Artifact Analyses: The following artifacts were collected: four nails (one square cut, two wire, and a tack); a brass and porcelain socket (converts a lamp socket to a plug socket, according to a hardware dealer); a metal tag stamped "34" on one side; a squeeze tube for glue or paint; and a window glass fragment. Date Range: 1900 to 1955, based on the presence of wire nails and church key-opened beverage cans (Clark 1977:122).

Site AT 30C (LA 33942)

Elevation: 5320 feet Topography: flat, broad terrace bordered to the east by the entrenched Rio Puerco River. Vegetation: native grasses, snakeweed. Site Description: The site consists of a trash scatter of household-related artifacts: dinnerware fragments, whole and broken bottles, food cans, automobile oil cans, and automobile parts. Artifact Analyses: One "Log Cabin Syrup" can and three nearly complete bottles were collected. The syrup can dates after 1927 (Rock 1978); one bottle has the brand name "NIFTY" silkscreen-painted onto it, and was bottled by the Dr. Pepper Co. after 1947 (Toulouse 1971:403-406); one bottle has the name "LISTERINE" embossed on it and is dated 1929 to 1954 (Toulouse 1971:403); the third bottle has the name "Fitch's" embossed in script. The opening on this bottle allows its contents to come out as droplets, such as those for after-shave bottles (no date). Date Range: about 1925 to 1955.

Atrisco Isolated Finds

AT IF 1A

Description: Embossed purpled bottle glass fragment - "Gillet's Chemical Works, Chicago." Date Range: 1880 to 1925 (Newman 1970:70-75).

AT IF 2

Description: Whole 16 fluid ounce bottle. Although the maker's mark is not exactly the same as the one published for the "Root Company" (1901 to 1932) by Toulouse (1972), it is similar. The "30" embossed on the base may be for the year the bottle was produced, or the number of the bottling plant. Toulouse does not mention numeral embossing on this company's bottles. Date Range: pre-1932.

AT IF 3A

Description: Two soldered tin milk cans. Date Range: pre-1922 (Rock 1978).

AT IF 6B

Description: Whole rectangular, clear glass bottle. This is a probable medicine bottle, holding 2.5 fluid ounces, and was made by the "Hazel-Atlas Co." Date Range: 1923 to 1964 (Toulouse 1972:239).

AT IF 10C

Description: Trash scatter containing fragments of milk bottles ("Valley Gold" with date 8/8/48 on seals), pickle jars, canning jars, coffee cans, beer cans, radiator flush containers and one Coors beer can. Date Range: about 1948, based on milk bottle date.

AT IF 16C

Description: Possible kerosene can with over 20 holes punctured into the base. The can was apparently re-utilized as a strainer. Date Range: not known.

Atrisco Historic Sites: Conclusions

The Elena Gallegos-Atrisco Tract survey resulted in the recording of seven historic sites and two historic components. The datable artifacts found on these historic manifestations indicate a historic occupation of the surveyed area no earlier than the 1870s. There was a peak period of land use during the early twentieth century and slackened use, or even abandonment, by the 1960s.

All of the artifacts are of Anglo-American industrial manufacture. The one historic habitation locus (AT 2B) situated just outside the Atrisco Tract possesses a feature that is most typical and definitive of the Anglo homestead - a windmill-operated well head with an associated cistern. As noted in the Atrisco Tract historical overview, such wells and cisterns allowed for the exploitation, albeit short-lived, of marginal grazing lands which otherwise could not have been used. The total absence of Hispanic habitation sites and artifacts is not surprising due to the dichotomous land use patterns between the Anglo homesteader and the Hispanic villager within the Rio Puerco Valley, as described above.

Cedar Crest, Cedar Grove and Edgewood Tracts

Area History

Little has been written about the Cedar Crest, Cedar Grove and Edgewood areas. In order to provide a history of these tracts an expanded study area was researched.

A Tijeras Canyon Village known as San Miguel de Laredo was first settled in 1763, but it was abandoned in 1770 after a Gila Apache raid. It was not until 1817 that families from the Albuquerque area were again allowed to live at San Miguel de Laredo on the Cañon de Carnue Grant (Cordell 1980:45-46). The subsistence living o small settlements included raising sheep and go hauling firewood to Albuquerque, hunting buffalo, t ing along the Santa Fe Trail and farming. Water constantly a problem. Settlements grew in populatio the northeastern section of the grant where water more readily available, although frost damage was n likely here (Cordell 1980:48).

Mining to the north also brought settlers to the reg The mountains north of the study area were first ploited by Indians for turquoise and later by the Spa for turquoise and gold. Gold was discovered in 1 about nine miles northeast of what was later to be kn as Golden. It is believed to be the earliest official mi district in the west. The resulting gold rush produ $60,000 to $80,000 a year from 1832 to 1835 accor to Santa Fe trader Josiah Gregg. The scarcity of wa however, inhibited extraction of the precious ore, an the late 1830s production had tapered to $30,00 $40,000 per year even though a new placer disco near Golden had opened (White 1973:1).

In 1846, when the United States gained possession o region, both old and new placers were being worked. Adolph Wislizenus, a scientist, noted that approxima 200 miners worked the "Old Placers" while about men were at the "New Placers." In the winter, when w was more plentiful, the numbers of miners rose to ne 2,000. The Civil War, Indian hostilities and the frust ing lack of water continued to minimize productio third discovery of gold and copper in 1879 broug renewed interest in Golden. A weekly newspaper, "Golden Retort," boasted of a town with a post of assay office, hotel, stores, saloons and nearly 3, miners (White 1973:3). The surrounding hills dotted with test pits dug by gold-hungry miners. Mi gradually declined, though, and by World War I Gol was almost a ghost town.

It was about this time that a tubercular health lo known as Well Country Camp, was established later-day Cedar Crest. The healthful atmosphere spectacular scenery prompted some of the lodgers to surrounding parcels. A post office called Tijeras loc in the small village of San Antonio to the south was m in 1924, and marked the official establishment of Cedar Crest community (Sharp 1936:2). The a around Edgewood and Cedar Grove were dotted homesteads dating back to the days of the Cañor Carnue Grant. After the first World War these areas very slowly. Post Offices and schools were establishe the 1920s.

Grazing continued to be the main economic footing the Cibola Forest closed off forest lands after World

II. The greatest population increase came after U.S. Highway 66 was completed and paved through Tijeras Canyon. The small community schools closed in the 1950s when busing of students became more cost-effective (Tom Horton, personal communication, April 1987).

The wooded area has gained renewed interest recently as the limits of Albuquerque continue to expand toward the mountains. These quiet communities provide weekend getaways and permanent residences for those who enjoy the same cool, healthy air the Well Country Camp health resort offered 40 years ago.

Cedar Crest Historic Sites

The sites within the Cedar Crest survey boundary are located in Bernalillo County. All sites were plotted on the Sandia Park 7.5 minute topographic map.

Site CC 1B

Elevation: 6980 feet Topography: ridge top. Vegetation: pinyon, juniper. Site Description: This site consists of a large hearth outlined with slabs of local rock. A trail (CC 2B) leads from the hearth to structural remains on private land to the south. The structure on private land appears to have been a two-room masonry building. The hearth was not used recently and no associated artifacts were noted. Date Range: not known.

Site CC 2B

Elevation: 6920 feet Topography: arroyo wash. Vegetation: pinyon, juniper. Site Description: This site is a trail leading from a structural site in a draw on private land and terminating at a hearth (CC 1B) on a ridge top. No artifacts are associated with the footpath. Date Range: not known.

Site CC 3B

Although no site form or map location could be found, a collection bag of artifacts labeled with the site number (CC 3B) was analyzed. The artifacts include a piece of clear pressed glass of a possible vase or candy dish; a small window glass fragment; one pre-1925 "K C Baking Powder" tin lid (Rock 1978), a child's fork embossed with the words "Bo Peep" and a small design of a girl with a shepherd's staff; a portion of a pulley wheel; and a headlight plate from an automobile. Date Range: pre-1925 (Rock 1978).

Cedar Grove Historic Sites

The sites within the Cedar Grove survey boundary are located in Santa Fe County. The sites were plotted on the Edgewood 7.5 minute topographic map.

Site CG 1B

Elevation: 6460 feet Topography: plains. Vegetation: grasslands. Site Description: The site consists of a 45 feet circular depression - possibly a dugout or tepee ring. Artifact Analyses: Collected artifacts include two food cans and 28 pieces from one pre-1925 purpled bottle (Newman 1970:70-75). Date Range: pre-1925.

Site CG 2B

Elevation: 6460 feet Topography: arroyo wash. Vegetation: pinyon, juniper. Site Description: The site is a circular pile of rocks which may be an old surveyor's mark. Artifact Analyses: Two .32 caliber "Smith and Wesson" shells and a fragment of what may have been a clay pigeon were noted. Various styles of the .32 shell were introduced between the mid-1870s and 1906. The shell size is very popular today (Barnes 1972:277-278). Date Range: 1900 to present.

Edgewood Historic Sites

The sites within the Edgewood survey boundaries are located in Santa Fe and Torrance Counties. The sites were plotted on the Chilili or Edgewood 7.5 minute topographic maps.

Site E 1A

Elevation: 6600 feet Topography: hillslope. Vegetation: pinyon, juniper. Site Description: The site consists of a small, one-room stone structure with a fireplace in the center of the room. A food can scatter, a "Model T" car and an old stove were also noted. The site was later tested, but the artifacts collected during testing were labeled like the survey collection; therefore, the entire assemblage was analyzed as one collection and is discussed in the excavation description of E 1A (Appendix 13-1). Date Range: see Appendix 13-1.

Site E 2A

Elevation: 6890 feet Topography: ridge. Vegetation: pinyon, juniper. Site Description: The site contains a single-room log cabin with standing walls three logs high.

There is also a small branch lean-to structure in a drainage below the cabin.

Artifact Analyses: Artifacts collected from the site include five datable bottles. One is a calibrated medicine bottle with the "BROCKWAY" maker's mark, dated 1925 to 1936 (Toulouse 1972:59). Another bottle has the embossed mark for the "Hazel-Atlas Co.," dated 1920 to 1964 (Toulouse 1972:239). A half pint liquor bottle is embossed with "FEDERAL LAW PROHIBITS...," which dates post-1932 (Ward et al. 1977:235). A fourth bottle has the "Owens-Illinois" mark, which dates 1929 to 1954 (Toulouse 1972:403), and a fifth bottle has a "Maywood Glass Co." mark, which dates 1958 to 1961 (Toulouse 1972:357). Date Range: 1932 to 1960.

Site ED 1A

Elevation: 6980 feet Topography: not noted. Vegetation: pinyon, juniper. Site Description: The site consists of a dugout and a structure having a porch. The structure and porch are delineated by a line of rocks. There is a mine pit about 50 feet south of the structure.

Archival research conducted on this tract of land shows that a patent was applied for in 1919 and cancelled in 1931. A homestead patent was then taken out in 1933 but this entry was cancelled in 1938. From that time until the late 1950s several mining claims were filed on the NE 1/4 of Section 6.

Artifact Analyses: Twelve artifacts were collected from the site. These included seven cans including two pre-1932 condensed milk cans (Rock 1978), and an "IDEAL BAKING POWDER" can embossed with the date "Feb. 2, 1924." There are several stove parts and one piece of window glass. Date Range: late 1920s to early 1930s; see Appendix 13-2.

Site ED 2A

Elevation: 6720 feet Topography: colluvial valley. Vegetation: pinyon, juniper. Site Description: The site has two or three dugout areas. One dugout has a partial wall of scrap metal and wood. An alignment of rocks, function unknown, is present next to a stone-lined well that is capped over with a concrete lid.

Artifact Analyses: Collected artifacts include 1934, 1937 and 1938 New Mexico license plates. There is a glass canning jar liner, bottle glass fragments, two pre-1925 "K C BAKING POWDER" cans (Ward et al. 1977:240) and a piece of window glass that may have been utilized as a scraper. Date Range: late 1930s to early 1940s; see Appendix 13-3.

Site ED 1B

Elevation: 6980 feet Topography: hill slope. Vegetat pinyon, slope. Site Description: Small lithic sca Artifact Analyses: Although the site form does not cuss a historic component, a collection bag of artif labelled ED 1B contained a 12 inch length of "Curtis Point" barbed wire, patented by J.D. Curtis, March 1893 (Glover 1975: Example #336), and a pocket-s tobacco tin dated post-1913 (Music 1971:54). Range: post-1913.

Site ED 3B

Elevation: 6900 feet Topography: edge of meadow ridge. Vegetation: pinyon, juniper. Site Description: site consists of a small trash scatter. Artifact Analy Collected artifacts include: 11 dinnerware fragm belonging to the same vessel, a wooden fork handl four-tine fork fragment, a metal handle of a cool utensil, two spice tins, two evaporated milk cans, a sc top cap to a "VA-TRO-NOL" jar and a one-quart "PUR bottle with the maker's mark of the "Latchford Glass of Los Angeles (design in use since 1957) (Toulo 1972:316). Date Range: late 1950s to 1960s.

Site ED 4B

Elevation: 6880 feet Topography: mesa. Vegetat pinyon, juniper. Site Description: This site consists corral made of pinyon and juniper logs. Some logs have been salvaged for firewood. Artifacts includ medicine bottle, a food can and wire mesh. Arti Analysis: The collected medicine bottle bears a mak mark identified as the "Brockway Glass Co.," 192 1936 (Toulouse 1972:59). Date Range: late 1920s- 1930s.

Cedar Grove Isolated Find

CG IF 1B

Description: Two hole-in-top cans were collected. By 1920s the hole-in-top can was no longer produced (Cl 1977:18). Date Range: pre-1920.

Edgewood Isolated Finds

ED IF 1A

Description: Crank handle for an unidentified toy. I Range: not known.

ED IF 3A

Description: According to the isolated find form, artifacts were noted but not collected. The artifacts are described as "metal stove parts and other debris." Date Range: not known.

ED IF 4A

Description: The isolated find form notes a scatter of tin cans which included the hole-in-top style. However, no artifacts were collected for analysis. Date Range: pre-1920 (Clark 1977:18).

ED IF 3B

Description: One stoneware fragment having a white salt glaze on the exterior and a dark brown glaze on the interior. Vessel type was not determined. Date Range: not known.

ED IF 4B

Description: A hydraulic brake fluid can. The logo on the can (of the head of an Indian in a Plains war bonnet) is still intact. Date Range: not known.

E IF 4A

Description: A collection of cans and glass fragments was recorded and collected; however, these artifacts were not located in the lab. A truck was also recorded on the site. Date Range: not known.

Cedar Crest, Cedar Grove and Edgewood Historic Sites: Conclusions

Twelve historic sites were recorded on the Cedar Crest, Cedar Grove, and Edgewood tracts of the Elena Gallegos Land Exchange. The variety of site types, from hearths to cabins, and date ranges can be seen in Table 13-2.

Examination of E 1A was completed in the fall of 1981. The ownership of the site appears to be both private and public. The NW 1/4 of Section 26 was patented in September 1921 and continues today to be privately owned. As noted in Gillio's discussion of the test excavations conducted on the site (Appendix 13-1) three of the four major features are probably outside the survey boundaries on private lands. Feature D appears to be on public land. This portion of the site was patented in 1925 but reverted to public domain at an unknown later date. A rock pile there may represent a fireplace or oven. An abandonment date for the site was not determined. The late-dating artifact assemblages recorded at a majority of the sites on the Cedar Crest, Cedar Grove and Edgewood tracts show that the area was settled only recently, a fact confirmed through historic and oral records.

Table 13-2. Twelve Historic Sites.

Site Number	Site Type	Date Range
CC 1B	Hearth	No date
CC 2B	Trail to hearth	No date
CC 3B	No site form. Artifact bag only.	pre-1925
CG 1B	Possible dugout or tepee	pre-1925
CG 2B	Probable surveyor's rock-pile	No date
E 1A*	Possible frame structure/fireplace or oven	1921-1925
E 2A	One-room log cabin and lean-to	1930-1960
ED 1A*	Mine. Poss. cattle camp	1920s-1950s
ED 2A*	Trash scatter, mainly automobile parts. Concrete-lined well.	1930s-1940s
ED 1B	Lithic scatter with historic artifacts collected	post-1913
ED 3B	Trash scatter	1950s-1960s
ED 4B	Corral	1920s-1930s

*Three sites (E 1A, ED 1A, ED 2A) were evaluated by David "A" Gillio, Jeffrey Boyer and Laurel Wallace. Two of these (ED 1A, ED 2A) were determined to be recent, and so were not excavated (See Appendices 13-1, 13-2 and 13-3).

Cl

Int

The
of d
Afri
Cal
the
and

In t
I wi
ove
how
the
sep
arc
tha
disc
of A
loca
eva
in t
and
reg

Th

Ea

Be
At
th
cc
as
fr
tl
u
E

Chapter 14 • Synthesis and Evaluation

Joseph A. Tainter

Introduction

The preceding chapters have presented great quantities of data on the collected, tested and excavated sites in the Atrisco and Placitas project areas. Jack Bertram and Galen Burgett have synthesized many of these data in their reports on the tested and excavated sites (Bertram and Burgett, this volume; Bertram, this volume).

In this chapter I will concentrate on three matters. Firstly I will characterize the nature of occupation in each area over time. The purpose of this exercise is to determine how the Atrisco and Placitas areas were used throughout the prehistoric occupation. Each area will be discussed separately. Secondly I will discuss those aspects of the archeological record in each area that are most salient — that is, most clearly patterned and most interpretable. In discussing these salient characteristics the prehistories of Atrisco and Placitas will be placed in contexts that are local, regional and extra-regional in scale. Finally, I will evaluate the 1982 research design (Tainter, this volume) in terms both of what we found at Atrisco and Placitas, and of the relationship of local to regional and extra-regional prehistory.

The Atrisco Project Area

Early Foragers

Bertram finds little or no evidence for early foragers in the Atrisco area (Bertram and Burgett, this volume). Although the area has yielded a number of medium-to-large corner-notched points that would normally be classified as En Medio, he believes that such points were collected from older sites and were also manufactured in later times. While acknowledging the possibility of Archaic use, he asserts that the area contains no definitely pre-Basketmaker sites.

Schmader, in contrast, believes that several of the sites he tested in the Atrisco area for the city of Albuquerque (after the Forest Service work was completed) did have Archaic components, although firm evidence was in most cases lacking. At site AT 33C (LA 33945), though, four radiocarbon dates were obtained, which firmly established a late Archaic date for this site. These ranged from 803 B.C. ± 90 (at one standard deviation) to 234 A.D. ± 80. These dates seem definitely to establish pre-Basketmaker use of the area (Schmader 1988, 1990).

To the northeast of the Atrisco project area, in the MacBeth Land Exchange, crews from the Bureau of Land Management located an En Medio and a San Pedro point. They ascribed many lithic sites to the Archaic period (Elyea 1987).

In nearby parts of the Albuquerque West Mesa and the upper Rio San Jose, of course, Judge has found extensive evidence of PaleoIndian occupation (1973). That such evidence was not found in the Atrisco area is not surprising. Any early sites located in the Puerco Valley floodplain would almost certainly have been buried by alluvium or colluvium. The adjacent slopes, in addition, were probably not the kinds of places where PaleoIndian hunters would have left behind diagnostic points. If PaleoIndians used the lithic raw materials on these slopes, that use will be hard to recognize except by radiocarbon dating.

The main Archaic occupation of this region seems to have been to the north-northeast, in the Arroyo Cuervo region (Irwin-Williams 1973). Here a combination of topographic and resource diversity, and permanent seeps, favored long-term settlement. Later in this era the zone of Archaic settlement expanded to include nearby parts of the Albuquerque West Mesa (Campbell and Ellis 1952; Reinhart 1967).

The Early Anasazi Occupation

The early Anasazi era is here meant to include the Basketmaker III (400 to 700 A.D.) and Pueblo I (700 to 900) periods of the Pecos classification. Basketmaker III witnessed one of the most substantial occupations of the Atrisco project area (Tables 14-1 and 14-2). Nine sites have been dated to this period, two of them (AT 31C and AT 37C) having structural remains. Bertram suggests that this occupation extends into the early Pueblo I period (Bertram and Burgett, this volume). Four Pueblo I sites are known from the area. Of these, AT 32C displays structural remains and AT 15C may as well. Bertram believes that this occupation dropped off in the late Pueblo I or early Pueblo II era.

The most substantial occupation during this period was at AT 32C. Here Schmader (1988) found two definite pithouses, two probable pithouses, two small depressions (possible external storage cists), a hearth and several ash deposits. Major, long-term occupation seems to be indicated.

Farther to the north, on the Bernabe Montaño Grant south of Mesa Prieta, Stewart Peckham found substantial Basketmaker III occupation. Thirty-five components were attributable to this period, with most displaying from one to ten pithouses. Pueblo I sites were somewhat fewer and more dispersed. Twenty-seven Pueblo I components were recorded. Peckham suggests that this Pueblo I occupation may have been a southern extension of the Guadalupe community, which seems to have begun about this time (Peckham 1987:93-94).

Table 14-1. Characteristics of Prehistoric Sites in the Atrisco Project Area.[1]

Site	Main Occupation Period(s)	Dates	Features	Activities and Settlement Characteristics
AT 1A	Late Archaic-PIII		Use-surface or floor.	Multiple occupations; gathering, processing, or habitation.
AT 3B	Late PII-early PIV		Cobble-lined hearth.	Multiple occupations; diverse assemblage of lon-local pottery.
AT 5B	Unknown			Small quarry and retooling locus.
AT 6B	Late PII-early PIV			Occasional lithic quarry station.
AT 8B	Late PIII-mid PIV			Short-term quarrying/camp/processing occupations.
AT 9B	Unknown			Initial reduction of local cobbles; removal of usable flakes.
AT 10B	Unknown			Initial reduction of local cobbles.
AT 11B	Late PII-PIII			Initial reduction of local cobbles.
AT 12B	PIV	A.D. 800±180[2] A.D. 1030±158 A.D. 1080±155 A.D. 1155±118 A.D. 1410±73	Small structure or ramada, ash stains, pit with charcoal, bone and lithics.	Plant-food processing; hunting; short-term occupation.
AT 6C	late PII-PIII			Temporary gathering camp; lithic reduction; food acquisition/processin
AT 8C	Unknown			Lithic processing.
AT 15C	PI/PII	A.D. 575±135 A.D. 835±190	Dense midden, use-surface, postholes, structural remains, (jacals?)	Multicomponent; occupational/structural; local maize production, hunting, plant-food gathering.
AT 17C	PIII			Unknown
AT 18C	PIII		Hearths.	Unknown
AT 19C	PIII-PIV			Unknown
AT 20C	Unknown			Unknown
AT 21C	PII-PIII		Hearth.	Lithic extraction and/or food processing.
AT 22C	Late PI/early PII			Quarrying.
AT 24C	BMIII; later Puebloan?			Unknown.
AT 25C	BMIII		Hearth.	Agriculture?
AT 27C	Unknown			Final-stage lithic reduction.
AT 28C	BMIII			Quarry; tool production; camp.

Table 14-1. Characteristics of Prehistoric Sites in the Atrisco Project Area.[1] (Continued)

Site	Main Occupation Period(s)	Dates	Features	Activities and Settlement Characteristics
AT 29C	PII-PIII			Several components; special-use.
AT 31C	BMIII, PII	A.D. 500±113 A.D. 995±120	Midden, plaza, ash stains, ash-filled pits; possible structure.	Possibly residential; reoccupied.
AT 35C	Mid-Archaic?, Late Archaic, Puebloan?		FCR concen- trations, ash stain.	Often-used camp and retooling locus.
AT 36C	Unknown		Ash stains w/ FCR & bone.	Plant and small game consumption.
AT 37C	BMIII		Mudstone concentrations w/groundstone, hammerstones; depression, hearths, structure.	Habitation; processing.
AT 38C	PII		Hearth.	Special-purpose processing, fieldhouse, or small habitation.
AT 32C	PI		Pithouses, cists, hearth, ash stains.	Long-term occupation probably based on agriculture.
AT 2C	BMIII, late PII-early PIV		2 small jacal structures.	Small occupational site.
AT 3C	PI- early PIV		Jacal structure: 15 rooms in 3 room blocks; hearths. Buried pithouses?	Village; long-term occupation; probably based on local agriculture.
AT 14C	PII-PIII		2 small masonry structures.	Occupational site or fieldhouse.
LA 77420	Unknown			Unknown
AT 33C	Late Archaic	803 B.C.±90[3] 226 B.C.±70 467 B.C.±80 234 A.D.±80	Hearths, ash stain.	Repeated short-term camps.
AT 34C	Middle to late Archaic?; PII		Ash stains, firepit (Archaic?)	Repeated short-term camps.

Notes:
1. After Bertram and Burgett (this volume) and Schmader (1988, 1990), with modifications.
2. Unless reported otherewise, all radiocarbon dates are reported at the 95% confidence interval, and calibrated according to the tables published by Klein et al. (1982).
3. Dates in this series calibrated by Beta Analytic, Inc.; error reported at one standard deviation.

Table 14-2. Atrisco Structural and Non-Structural Sites by Time Period.

Site Number	Structural	Non-Structural
Basketmaker III, 400 to 700 A.D.		
AT 1A		X
AT 8B		X
AT 2C		X[1]
AT 9C		X
AT 24C		X
AT 25C		X
AT 28C		X
AT 31C	X	
AT 37C	X	
Pueblo I, 700 to 900 A.D.		
AT 3C		X[1]
AT 15C	?	
AT 32C	X	
AT 8B		X
Pueblo II, 900 to 1100 A.D.		
AT 3B		X
AT 6B?		X
AT 1C?		X
AT 3C		X[1]
AT 6C		X
AT 14C		X[1]
AT 15C	X	
AT 21C		X
AT 29C		X
AT 38C		X
AT 31C	X	

Site Number	Structural	Non-Structural
Pueblo III, 1100 to 1300 A.D.		
AT 1A		X
AT 3B		X
AT 6B		X
AT 8B		X
AT 11B		X
AT 1C		X
AT 2C	X	
At 3C	X	
AT 4C		X
AT 6C		X
AT 7C		X
AT 9C		X
AT 11C		X
AT 14C	X	
AT 17C		X
AT 18C		X?
AT 19C		X
AT 21C		X
AT 29C		X
AT 24C?		X
Pueblo IV, 1300 to 1600 A.D.		
AT 3B?		X
AT 6B?		X
AT 8B?		X
AT 12B	X	
AT 19C		X
AT 24C?		X
AT 29C?		X

[1] Structures on these sites probably belong to later occupation.

The late Archaic foraging/horticultural adaptation in the Arroyo Cuervo region was abandoned at this time. Irwin-Williams proposed that the reason for this was a drought between 600 and 700 A.D. She suggested that this drought caused erosion of the narrow canyon floodplains of the Arroyo Cuervo region, which had been the basis of late Archaic agriculture. Settlement accordingly shifted to the wider valley bottoms, which were less affected by erosion (Irwin-Williams 1973:15-16).

Pueblo I settlement was variable in the area from Salado Canyon (a tributary on the west side of the Puerco) to Guadalupe Ruin. Few sites of this period have been found in the Salado area, and Fritz suggests that the occupation may have not been permanent (1973). In the Guadalupe area, in contrast, Washburn assigns 95 sites to Pueblo I (1972, 1974). This was clearly a major a of early Anasazi settlement, and Irwin-Williams may h been correct that it is the area to which the Arroyo Cue population relocated.

Wimberly and Eidenbach made a survey of the lower Puerco, to the south of its confluence with the Rio S Jose. They found a single Basketmaker III scatter a five scatters probably or certainly attributable to Pueblo I period (1980:89).

The various surveys conducted along the Rio Puerco, a reviewed here, suggest that there was, in this era north-to-south gradient in occupational intensity. T densest occupation was around Guadalupe, Salado Ca yon and the Bernabe Montaño Grant. From th occupation became less intense down to the lower Rio Puerco, with the Atrisco project area showing an intermediate intensity of occupation.

The reason for this gradient is not certain. It could be that the Guadalupe area was attractive to early Anasazi due to its participation in San Juan Basin exchange systems (best documented for the succeeding time period), and concomitant opportunities for trade. Alternatively, it may be that upstream sections of the Rio Puerco produced more streamflow for irrigation and so could support denser populations. The latter possibility is superficially attractive, but it is based on the assumption that irrigation from the Puerco was possible. If the Puerco was becoming entrenched during the Puebloan period, as seems possible (see summary in Washburn [1974:320]), then it may not have been possible to irrigate. A third possibility, which may be preferred due to its simplicity, is that the Guadalupe area could support denser populations because it receives more rainfall, or more runoff from the adjacent mountains. In the summer months thunderstorms build frequently over Mt. Taylor, and many of these drift over the Puerco Valley around Guadalupe. The Atrisco area, in contrast, has no adjacent mountain range over which thunderstorms may so conveniently build. Receiving less rain than Guadalupe, it correspondingly supported lower prehistoric populations.

The Middle Anasazi Occupation

The middle Anasazi era is here considered to include the Pueblo II (900 to 1100 A.D.) and Pueblo III (1100 to 1300) periods of the Pecos Classification. Middle Anasazi occupation of the Atrisco area was substantial (Tables 14-1 and 14-2). Twelve Pueblo II components were recorded, of which three displayed structural remains. The latter include AT 15C, with dense midden, use-surfaces and possible jacal structures; and AT 31C, which deserves special discussion.

The latter site (also numbered LA 33943) was excavated by Matthew Schmader for the city of Albuquerque. He found ash stains, ash-filled pits and a possible structure. He obtained a radiocarbon date of A.D. 995 $\pm$ 120. Most interestingly, Schmader's map of the site (available only in draft at this writing) shows that features and artifacts distribute in a roughly doughnut-shape around a nearly empty area of about ten meters diameter. This distribution gives the impression of a multi-family encampment with a central plaza-like community area. It is interesting to find such a degree of structure in what seems to have been a seasonally-occupied site.

Bertram has suggested that the Atrisco area was less densely occupied from late Pueblo I to early Pueblo II, and that the middle Anasazi occupation occurred primarily from late Pueblo II through Pueblo III (Bertram and Burgett, this volume).

The available evidence suggests that, while there was much Pueblo II use of the Atrisco area, the occupation was not permanent. There are no definite indications of other-than-seasonal use. Thus, although there are a fair number of Pueblo II sites, Pueblo II occupation of the Atrisco region may have been less intense than Pueblo I.

There was substantial Pueblo III use of the area. Twenty sites show Pueblo III ceramics, and three of these have structural remains. These are AT 2C, with 2 small jacal structures; AT 3C, a substantial village with 15 rooms in three jacal room blocks; and AT 14C, with two small masonry structures. In this period the Atrisco area was probably occupied year-round.

To the north, Peckham found that the Bernabe Montaño Grant was virtually abandoned during Pueblo II: only seven components were dated to this period. He suggests that the population was attracted to settle around Guadalupe Ruin at this time (1987:94). Here, of course, substantial settlement continued (Fritz 1973; Washburn 1972, 1974).

Puebloans returned to the Bernabe Montaño Grant during Pueblo III. Peckham ascribed 59 components to this period. He suggests that this surge in occupancy followed the Chacoan collapse (1987:94).

The Pueblo II-Pueblo III abandonment and reoccupation sequence in the Bernabe Montaño Grant may parallel what we see in the Atrisco area. The latter area was not abandoned in Pueblo II, but the character of occupation shifted from mixed seasonal and long-term to purely seasonal. In Pueblo III in Atrisco we see permanent settlements again. This may, as Peckham suggests, reflect population dispersal after the Chacoan collapse.

The lower Rio Puerco at this time displays small pueblos dating to the Pueblo II and Pueblo III periods (Wimberly and Eidenbach 1980:89). It is not clear if the intensity of settlement in this period was greater than Atrisco's or less. It is clear, though, that both areas had less settlement than the Guadalupe region and the country south of Mesa Prieta.

The Late Anasazi Occupation

In the Pueblo IV period (post 1300), the Atrisco area was largely unused. Possible Pueblo IV components were found at only seven sites (Tables 14-1 and 14-2), and most of these are questionable. Only one site, AT 12B (LA 33912), had structural evidence. This was a small structure or ramada, with ash stains, and a pit containing charcoal, bones and lithics. Schmader suggests that this was a temporary camp where a variety of subsistence activities were carried out (1990).

To the north, the Bernabe Montaño Grant, Salado Canyon, and the Guadalupe area were all abandoned or used only sporadically after the early fourteenth century (Peckham 1987; Fritz 1973; Washburn 1972, 1974).

While these areas were being abandoned, the lower Rio Puerco shows a very different pattern. A number of Pueblo IV sites have been recorded here, including the major center of Pottery Mound (summarized in Gossett [1980:215]). This occupation is best considered a part of the extensive Pueblo IV settlement of the adjacent Rio Grande.

The Pueblo IV abandonment of the Atrisco and Guadalupe areas is not surprising, even if the reasons for it are little understood. Much of western New Mexico was abandoned by the early fourteenth century, and the central Rio Puerco is only part of this widespread pattern. The abandonment of such large areas is one of the major, unexplained episodes of New Mexico prehistory.

Atrisco: Assessment of the Prehistoric Occupation

The primary use of the Atrisco area at all times seems to have been seasonal. Even when there is evidence of substantial settlements and long-term occupation, the majority of the sites appear to have been short-term foraging and lithic reduction loci.

This being so, the prehistoric occupation of Atrisco cannot be understood by itself. The people who used Atrisco also used other locations at various times of the year. Their use of Atrisco will not be fully understood until their uses of other areas are also known. Yet the Atrisco data give important clues about relationships with other areas, and have very significant implications for delineating regional economic and social relationships. I will return to these matters shortly.

It will be useful first to summarize the prehistoric occupation. Early foragers apparently had little use for the area. Unless there are earlier remains that we cannot recognize, or have not found, the earliest use of the area seems to have been post 1000 B.C. This date may be important, for in adjacent areas Archaic people were experiencing major changes at about this time. Among the Arroyo Cuervo population, for example, Irwin-Williams has concluded that a strong pattern of seasonal transhumance developed at this time (1973:11-15). Albuquerque's West Mesa experienced its most intensive Archaic use after 1000 B.C. (Reinhart 1967).

In the period from about 400 to 900 A.D. there was a dramatic increase in use of the Atrisco area. People who apparently resided elsewhere now found the area attractive, probably for summer horticulture, foraging and lithic procurement. The pressures that forced people to rely more heavily on agriculture, and to build substantial pithouses, in the Basketmaker III period, apparently also forced people to range more widely in the search for resources. This meant increased occupation in areas that had previously been little used, such as Atrisco. On occasion, during this time, the Atrisco area was occupied for periods longer than a season. This is indicated by the substantial site of AT 32C, which is probably not the only site of this type in the area.

The middle Anasazi use of Atrisco was even more substantial, although it may be, as Bertram argues (Bertram and Burgett, this volume), that between about 800 and 1000 A.D. there was a period of less intense use. Certainly after that date Atrisco was used much as it had been before — largely on a seasonal basis for agriculture, foraging and lithic reduction, with the occasional establishment of more substantial settlements such as AT 3C. Although more people used Atrisco in the middle than the early Anasazi periods, the character of the occupation apparently remained much the same. This was virtually the end of Puebloan occupation, though. As with much of western New Mexico, the Atrisco area was abandoned early in the Pueblo IV period, and used thereafter only sporadically.

In addition to consistency in use, one other aspect of the Anasazi era stands out. This is the direction from which pottery was imported. Warren's analysis discloses, firstly, that virtually all pottery used here was imported (Warren and Warren, this volume). There is little evidence of local production (that is, production at Atrisco, as opposed to the Rio Grande Valley). Secondly, nearly all of the pottery came from areas to the west. Moreover, pottery was imported from the west in all periods, from Basketmaker III to Pueblo III. This pattern persisted for centuries, until the area was abandoned early in the Pueblo IV period.

Of nearly 1000 Atrisco sherds collected during the project and dating to Pueblo III or earlier, only about 50 (approximately five percent) are attributable to production in the middle Rio Grande Valley, Tijeras Canyon, or Tesuque. Of the remaining sherds that can be attributed to specific or general production localities, almost all were made in areas ranging in an arc from west-northwest to southwest. This arc includes such areas as Lobo Mesa, the Red Mesa Valley, San Mateo, Grants, Acoma, the upper Little Colorado drainage basin, the region of the Datil Volcanics, and the upper Rio Salado drainage basin. A few sherds can be attributed to other areas to the west, such as eas central Arizona or the San Juan Basin (Warren and Warren, this volume). This pattern holds both for sites used seasonally and for those that sustained longer occupations (e.g., AT 32C [Table 12-36] and AT 3C [Table 12-12]).

It is unusual to find in the archeological record a pattern so clear, strong and persistent. In all likelihood two factors will account for it. Both involve the formation of economic relationships between the Rio Puerco Valley and the higher-elevation terrain to the west and southwest.

The first factor was seasonal transhumance. Many of the seasonal sites at Atrisco — or at least many of the seasonal sites with pottery — must have been used by people who at other times of the year lived in the higher elevations to the west and southwest. These areas are known to have sustained large populations that were permanently resident, but Atrisco was apparently regarded as within their territory of use. No doubt the seasonal use of Atrisco varied from year to year, depending primarily on the amount and distribution of rainfall. Atrisco would not have been a good place to plant or forage each and every year.

Farming would particularly have been affected by year-to-year changes in the distribution of rainfall. A year of good rain directly over Atrisco would obviously make it attractive for summer use. Yet if the Puerco was irrigable in this area, then extra rain in the headwaters of the Puerco would also have favored Atrisco agriculture. It is reasonable to expect that any people whose customary territory included both higher-elevation (e.g., the Acoma area, or the upper Rio Salado) and lower-elevation terrain (e.g., Atrisco) would have done some planting in both areas. This would increase the likelihood that a good crop could be raised, and is a common strategy among agricultural people.

Secondly, at times when Atrisco was occupied continuously for substantial periods, the people resident here apparently had their major economic ties with people to the west and southwest. In all likelihood their main social and cultural ties lay in these directions as well. Again, the reason for this would have been to increase subsistence security by economic linkages between areas potentially experiencing different productivity cycles.

It is likely, but not yet certain, that this east-west trend in transhumance and economic ties stopped at the Puerco. It did not extend the few miles further east to the Rio Grande. Unfortunately, few ceramic temper studies comparable to that done at Atrisco have yet been done with Albuquerque-area ceramics. One site that has been investigated in a comparable manner is the Coors Road site, a Pueblo III pithouse village containing pottery tempered with a mica schist that Warren (1985) believes to be from the Socorro District. This temper could also, apparently, be from Tijeras Canyon (Anscheutz 1987:150).

It has often been noted that Albuquerque-area ceramic assemblages contain high percentages of ceramics that look as if they could have come from the south. Early Albuquerque-area pithouses often display Mogollon-like features as well, along with Mogollon-like ceramics (e.g., Allen and McNutt 1955; Peckham 1957; Schorsch 1962; Vivian and Clendenen 1965; Frisbie 1967). These characteristics have often been interpreted as indicating either that Albuquerque-area populations were imitating some of the material culture of their southern neighbors, or that Mogollon peoples actually moved into the area, bringing their material culture with them. Recently, though, it has been shown that the assemblage mixing in the Albuquerque area can be explained better as resulting from weak participation in two interaction networks: a northwestern one centered on the San Juan Basin, and a north-south riverine one (Tainter 1984; Tainter and Plog 1990).

The lack of ceramic temper studies in the Albuquerque area makes it difficult to compare directly Rio Grande and Rio Puerco ceramics. This being so, other sources of information had to be found. To explore further the origin of Albuquerque-area ceramics I queried four specialists in the pottery and/or prehistory of the area: Matthew Schmader, David Hill, Linda Cordell and Regge Wiseman. To each I put the question: "Prior to Pueblo IV, where did most Albuquerque-area ceramics come from — a specific direction, or locally-made?" Each graciously offered a thoughtful answer to this audacious question. The answers fell into two groups: (1) the pottery was mainly locally-made; or (2) some early pottery was imported from the west, while later pottery was locally-made.

These opinions, of course, cannot substitute for careful, systematic, petrographic studies, but one point is clear. There are presently no indications that the Albuquerque-area was so dominated by western pottery imports as was Atrisco, and there are definite indications to the contrary.

If the last statement can be provisionally accepted, two very important points can be suggested. The first is that the Atrisco area was at the eastern end of an east-west network of transhumance and economic exchange. The second, and more important, is that there was an economic boundary between Atrisco and Albuquerque — a boundary which persisted for centuries. The existence of such a boundary would imply that there was also between Atrisco and Albuquerque a social boundary and a cultural boundary. This would be the inevitable result of a situation where people using or occupying the Atrisco area interacted primarily with people to the west.

It remains to consider why this boundary would have formed where it did. In discussing elsewhere the mixed assemblages of Albuquerque-area archeology, I pointed out that Albuquerque populations participated minimally in the San Juan Basin exchange network because their territory was redundant. San Juan Basin people looking to trade with people possessing a riverine resource base would have found a closer candidate in the Rio Puerco — where Guadalupe Ruin is one of the earliest Chacoan Outliers (Pippen 1987). Extending such a trade network beyond the Rio Puerco to the Rio Grande would have been superfluous and costly. Hence Albuquerque-area populations never participated fully in the San Juan Basin exchange system (Tainter 1984; Tainter and Plog 1990).

Similar considerations would apply in the case of people resident in the higher-elevation terrain of the Acoma area, or the upper Rio Salado drainage basin. If such people sought to include a lower-elevation river valley in their territorial round, or to trade with people living in such an area, the logical candidate to the east would be the Rio Puerco. In such a case the Rio Grande would be redundant, and would entail extra costs in travel and transport. Hence between Atrisco and Albuquerque we find a boundary — economic certainly, and probably social and cultural as well.

This situation has one further implication, and that concerns the entire matter of early and middle Anasazi cultural evolution in the Albuquerque area. Albuquerque has always been an archeological puzzle, both because of the mixed characteristics of its assemblages, and because prior to Pueblo IV it did not parallel cultural evolution in areas to the west. While northwestern New Mexico was experiencing the development of large communities, great pueblos, political and economic hierarchies and extensive trade systems, the middle Rio Grande was characterized by small populations occupying pithouse villages, and showing little evidence of social differentiation or intercommunity hierarchies (Tainter 1987:19). As discussed in the next section, it is only after the abandonment of northwestern New Mexico that Albuquerque-area populations began to evolve noticeable complexity.

It is possible now to begin to sketch why Albuquerque prehistory has this character. The earlier evolution of complexity in and around the San Juan Basin was prompted by high population densities and a risky environment. The response was, in some places, the development of regional economic and political hierarchies and exchange systems. These systems served to moderate subsistence uncertainties in a fluctuating environment (Tainter and Gillio 1980:100-113; Schelberg 1982; Tainter 1988:178-187; Tainter and Plog 1990). By being incorporated into these exchange systems, and b emulating organizationally more complex communitie much of the Anasazi population of northwestern Ne Mexico evolved toward complexity in a lockstep fashio

The Anasazi of the Albuquerque area, in contrast, partic pated minimally in these exchange systems. To th people of northwestern New Mexico the middle Rio Grand was redundant and unimportant. Thus populations i what is now the Albuquerque area experienced littl stimulus to evolve toward complexity. They did not nee to aggregate around trade centers such as Guadalup Ruin; they did not need to adopt the social convention of more complex trading partners; and they did not nee to intensify production to have surpluses for exchang By living in an area that was environmentally superflu ous, they were able to maintain low complexity an cultural stability until the more complex societies to th west collapsed, and their territories were abandone This changed forever the world of the Rio Grande Anasaz as will be related next in the discussion of the Placita area.

The Placitas Area

Early Foragers

The early occupation of the Las Huertas locality i enigmatic. A small number of projectile points recovere during survey and testing indicate that early hunter used the area, but to what extent is not known. Th following early points were recovered.

PL 5B:	(1) Eden (late PaleoIndian); (2) Bajada (4800 to 3200 B.C.; (3) En Medio (800 B.C. to 400 A.D.).
PL 33A:	Jay (5500 to 4800 B.C.).
PL 38A:	Bajada (4800 to 3200 B.C.).
PL 22A:	San Jose (3200 to 1800 B.C.).
PL 4A:	En Medio (800 B.C. to 400 A.D.).
PL 7B:	En Medio (800 B.C. to 400 A.D.).
PL IF92A:	En Medio (800 B.C. to 400 A.D.).

In addition, Ronald Switzer has located a number c Archaic projectile points just south of the Placitas are in the northwestern foothills of the Sandia Mountains. map of Switzer's finds is on file at the Supervisor's Offic Cibola National Forest.

Monitoring of construction of the Shell CO_2 pipelin which in this area runs primarily through the Las Huerta Valley itself, produced little further data on early occupa tion. A Folsom point midsection was found on LA 27633 (Knudson 1982). Archaic occupations were suspected at LA 44536 (which yielded a Bajada point), LA 35711 and LA 44535. LA 45503, a site discovered during construction, contained three hearths and yielded two radiocarbon dates: 2630 B.C. ± 55 (DIC-2780) and 900 B.C. ± 75 (DIC-2779) (both uncorrected). These dates and features indicate that the site is a middle to late Archaic camp (Marshall, Akins and Winter 1986:94-98). The discovery of this site indicates that others may lie buried in the alluvium of the Las Huertas Valley.

Little can be made of such sparse data except by comparison with nearby areas. Thomas Lyons' survey of early remains in the Estancia Basin (1969), to the southeast, revealed that the retreating shoreline of Lake Estancia was home to a persistent occupation of PaleoIndian and Archaic people. To the west, the extensive Archaic occupation of the Arroyo Cuervo region (Irwin-Williams 1973) and, in the late Archaic, of the Albuquerque West Mesa (Reinhart 1967), were discussed above.

The early occupation of the Las Huertas area is significant mainly for negative evidence. In comparison with the Estancia Basin and the Arroyo Cuervo, it is clear that Las Huertas was used as a hinterland: an area for occasional resource gathering, but not a place that could sustain intensive settlement. In this regard the Placitas area is like the middle Rio Grande Valley in general, where early sites reflecting intensive occupation are uncommon. It is not clear why this should be so. Much to the south, Marshall and Walt (1984) found a significant concentration of Archaic sites along the Rio Grande, at the northern end of the Fra Cristobal mountain range. These sites were located along the river margin in dunes and sandy areas.

So far, the evidence presented for early occupation in the Placitas area has consisted of little more than projectile points. This may be a pitfall: it is possible that what was discussed as evidence for early <u>use</u> of Las Huertas is only evidence for early <u>hunting</u> in the area. Las Huertas could conceivably have been little used for early hunting, but intensively used for other purposes. The project obtained substantial evidence bearing on this question. Unfortunately, that evidence can sustain more than one interpretation.

Obsidian Hydration Studies

The riverine gravels that make up the hills and ridges above Las Huertas Creek contain abundant obsidian nodules. These are from sources in the Jemez Mountains and they were routinely sought as raw material by prehistoric people. During survey and excavation a good quantity of chipped obsidian was collected. From this collection a sample was collected for obsidian hydration dating. Ultimately 420 dates were obtained.

The most common obsidian types at Placitas were 3500, 3520, 3523, 3535 and 3530. Samples of each were submitted to MOHLAB to determine source-specific hydration rates by induced hydration. The results are detailed in a series of reports by Joseph Michels (1984b, 1984c, 1984d, 1984e and 1985). Types 3520 and 3525 proved to be chemically identical (Michels 1984e, 1985) and can be treated as a single source for calculating dates.

Items to be dated were assigned on visual criteria to one of the five groups, and submitted to the UCLA Obsidian Hydration Laboratory to have their hydration rinds measured. In retrospect it is likely that this procedure of visual selection introduced some ambiguity into the results, for a single source can vary in its visual properties and yet not vary chemically (Joseph Michels, personal communication to William Whatley dated April 6, 1985). Presumably this raises the converse possibility, that chemically different sources could look superficially similar. If so, then assigning specimens visually to sources may mean that incorrect constants are applied in the dating equation. As illustrated in Fig. 14-1, this could result in dating errors of up to several hundred years. In part for this reason I will not single out individual dates, but will concentrate on the overall distribution of dates, where individual errors are likely to cancel each other out.

For calculating the hydration dates, climatic data from the Albuquerque airport were used. It is only a few miles south of the Placitas project area, and lies in a similar topographic situation — the first bench east of the Rio Grande floodplain. The Albuquerque airport has an annual mean air temperature of 13.4°C, and an annual mean air temperature range of 24.4°C.

The calculated dates are shown in Appendix 14-1. To reveal trends in intensity of use, the dates were grouped into 500-year intervals, and a graph was made showing numbers of dates per 500-year interval. This graph (Fig. 14-2) shows an initial date of about 9250 B.P. From this point it rises nearly monotonically to a peak at about 3250 B.P., and thereafter declines monotonically until about 250 B.P., which represents the last date.

Interpreted literally, this graph would show that there was Archaic use of the area far more intense than could be inferred from the recovered projectile points. This use peaked in the middle Archaic and thereafter declined. The later Anasazi occupants appear from this chart to have used the local obsidian little. This seems curious, and makes one suspect that something in the analysis has gone awry.

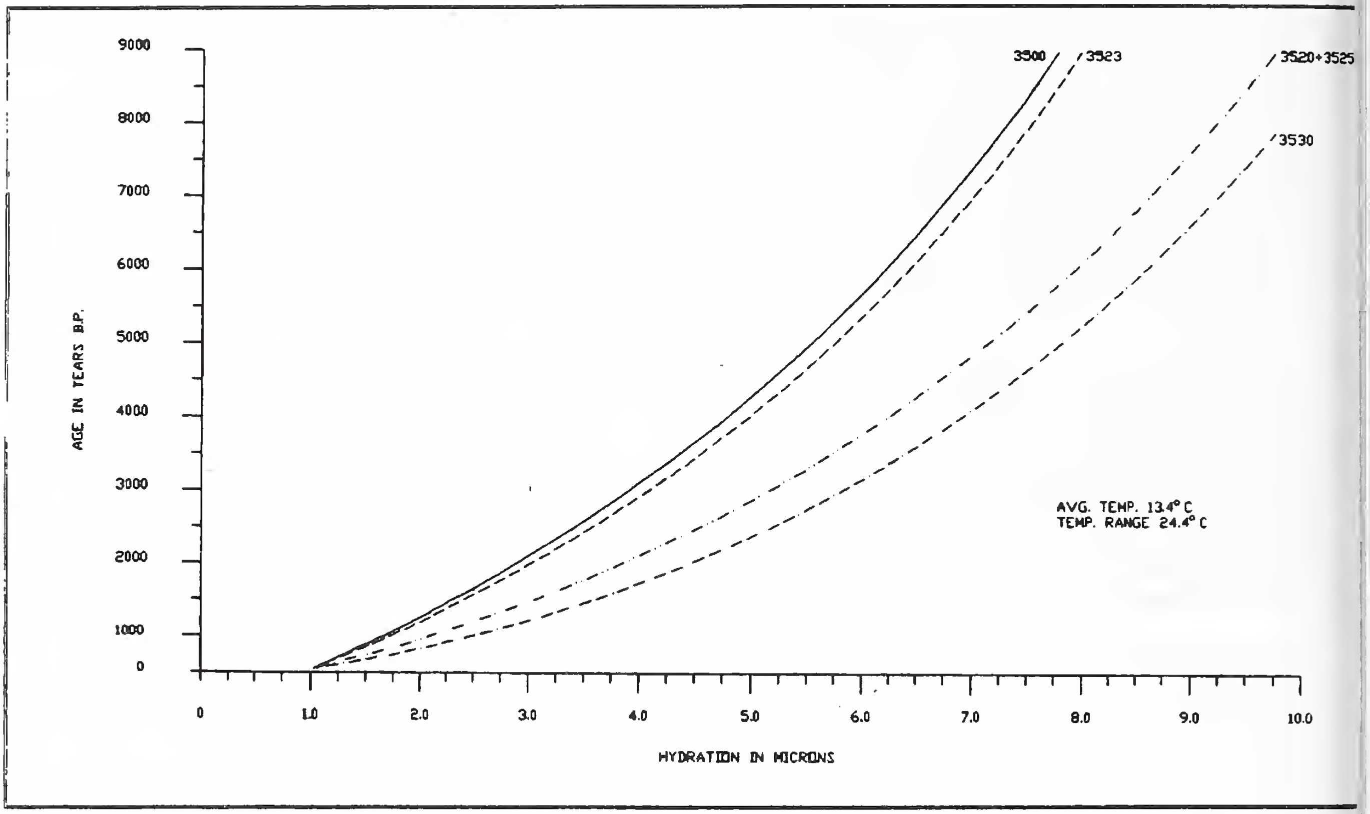


Figure 14-1. Hydration curves for Jemez obsidian types found in the Placitas area.

As Jack Bertram has detailed elsewhere in this volume, his work on obsidian assemblages at Abiquiu Reservoir and in California indicates that surface obsidian hydrates at a rate far faster than buried obsidian — perhaps as much as four times faster. The Placitas obsidian was nearly all from the surface. This may be why the distribution in Fig. 14-2 shows so little use during the Puebloan era, when we know that Las Huertas was settled with increasing intensity.

The obsidian from excavated sites PL 30A and PL 32A corroborates Bertram's suggestion. As shown in Appendix 14-1, PL 30A shows a range of obsidian dates from 7276 B.C. to 14 B.C., with a mean of 2999 B.C. These dates are much too old for a Pueblo II site. If the mean figure is divided by four, though, the result is approximately A.D. 750, which is only about 150 years too old for the Puebloan occupation, and which in fact corresponds well with the early radiocarbon dates from the site. Similarly, the six obsidian dates from PL 32A range from 1434 B.C. to 473 A.D., with a mean of 438 B.C. Again, this is much too early for a Pueblo IV site. Yet if the mean date is divided by four the result is about A.D. 1375, which is quite acceptable. Based on these results I am inclined to accept Bertram's argument, and to conclu provisionally that the Placitas obsidian dates shou each be corrected by a factor of roughly 0.25.

Applying this factor to the data in Fig. 14-2 produces th corrected graph shown in Fig. 14-3. Here the initial da is about 2313 B.P., the mode is about 813 B.P., and th terminal date is about 63 B.P. This is a less troubleson range of dates, for it shows that the peak use of the grav outcrops above Las Huertas Creek corresponds rough to the peak use of the Las Huertas Valley itself. In oth words, the use of these riverine gravels can be ascribe to the Anasazi.

As for earlier users of the area, we are drawn back to th conclusion reached from the paucity of early projecti points: this area was little used during the PaleoIndia and Archaic periods.

The Early Anasazi Occupation

While the forager occupation was sporadic and limite during the Basketmaker III and perhaps Pueblo I period use of the area became increasingly intensive. This is t

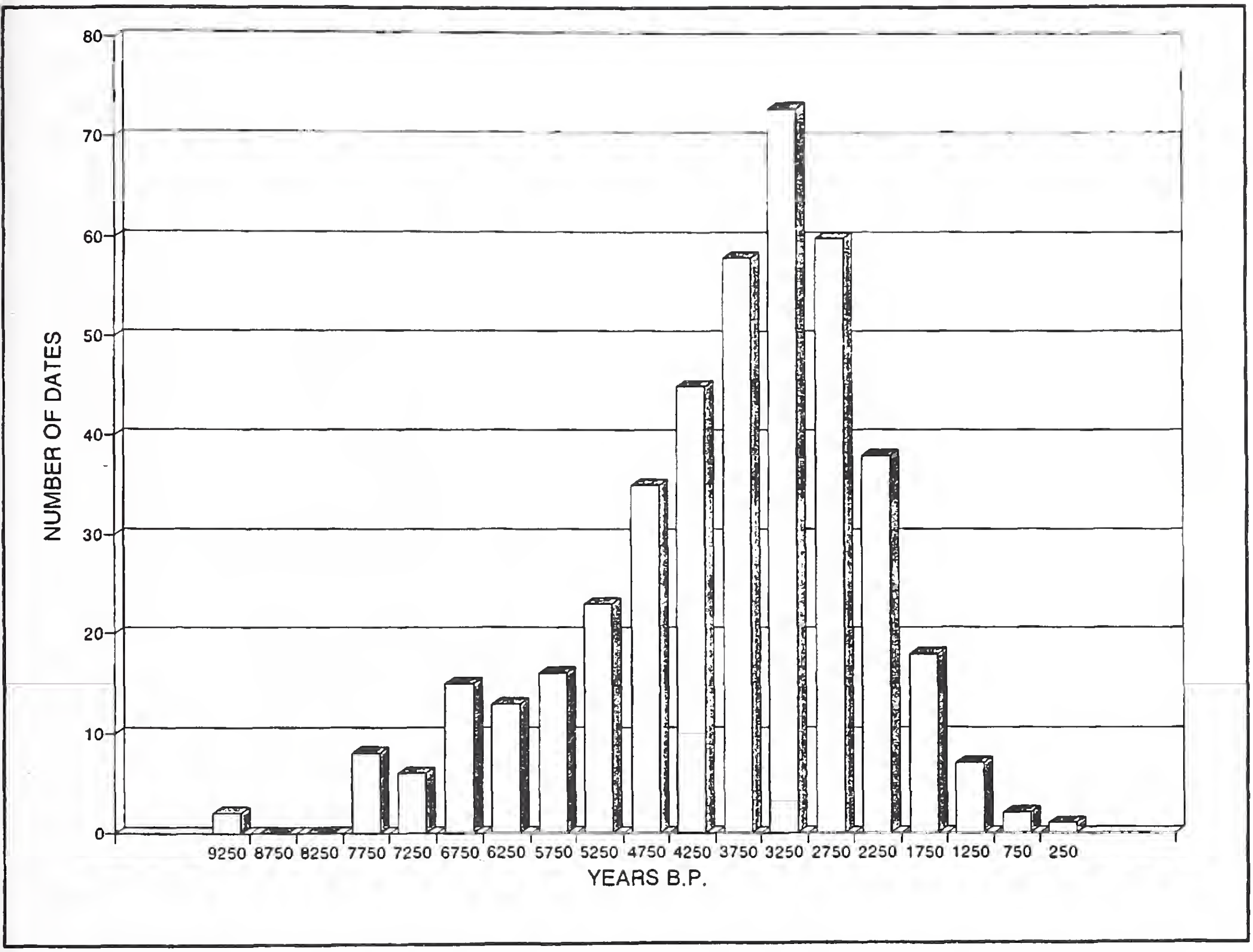


Figure 14-2. Distribution of obsidian hydration dates for the Placitas area, based on original equations.

say that the people who occupied Las Huertas during these times did so in a manner that involved more and more investment in modifying and manipulating the local environment.

Basketmaker III sites found during the Elena Gallegos project are PL 74A and PL 25B (Tables 14-3 and 14-4). PL 25B contained a rock alignment, but there is no other evidence from this period in the project area of structures, substantial features, or other indicators of prolonged occupation.

The major evidence for intensified use of the valley at this time comes from LA 44539, a late Basketmaker III to early Pueblo I site discovered during grading for the Shell CO_2 pipeline. The portion of the site within the pipeline trench was excavated by the Office of Contract Archeology, University of New Mexico, and has been reported by Marshall, Akins and Winter (1986:81-87).

This site contained a variety of features, including a domicile. The latter feature was a shallow basin, which probably originally had a wickiup-like superstructure. It contained an interior hearth and 18 pits across its floor. Ceramics from the site included La Plata B/w, Lino Gray, an early Pueblo I slipped whiteware and Kana'a Neckbanded.

A single radiocarbon date was obtained: 1200 B.P. ± 40 (DIC-2781): A.D. 750 (uncorrected). The authors estimate that the site was occupied around 750 to 850 A.D.

The interior hearth may be significant, for it suggests a cool- or cold-season occupation. This may thus be more

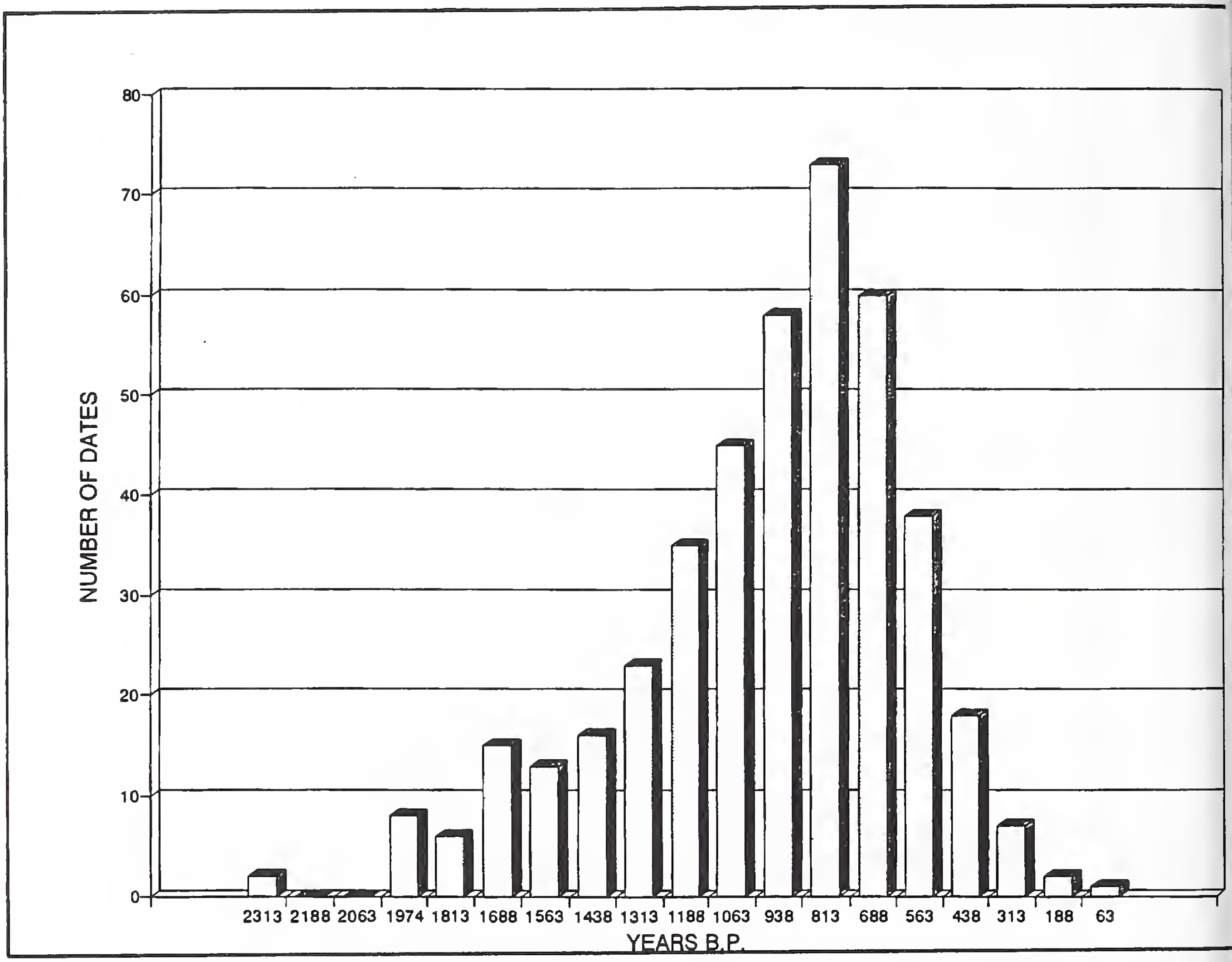


Figure 14-3. Modified distribution of obsidian hydration dates for the Placitas area, based on correcting original dates by 0.25.

than merely a Basketmaker field house. It is possible that by about 800 A.D. at least one family used Las Huertas as a late fall, winter and/or spring base. Since this site was found only after blading, it may be that other such sites are buried in the Las Huertas Valley.

Elsewhere in the Albuquerque area at this time, pithouses tended to be located at the margins of the East and West Mesas (see the reports cited above in the discussion of the Atrisco sector), in well-drained soils, overlooking the Rio Grande Valley. These pithouses are usually far more substantial than the structure at LA 44539 and indicate more intensive occupation. Thus, although Las Huertas was more intensively used in the early Anasazi era, it was peripheral to the settlements of the main valley.

If the correction to the surface obsidian readings di cussed above is valid, then in the period leading up to ai including the early Anasazi era, the general Las Huert area experienced an explosion in the use of its resourc of game, plants and lithic raw materials.

It is curious that, as at Atrisco, the Pueblo I peri appears to be underrepresented. It may indeed be th the Las Huertas area was only minimally used at th time, but if so, the reason is not clear. Alternatively, t apparent dearth of Pueblo I sites may be merely a artifact of our ceramic classification.

The Middle Anasazi Occupation

During the period from 900 to 1300 A.D. (Pueblo II and Pueblo III) it is apparent that Las Huertas became ever more important to the regional population — although still as an area of peripheral use.

Pueblo II sites discovered during this project include PL 30A, PL 40A and PL 8A. The first two contain structural remains. Pueblo III sites are PL 43B, PL 51B and PL 21B. The first of these is a structural site and the second may be also (Tables 14-3 and 14-4). Other Pueblo II and III sites known from the Las Huertas area are shown below. These sites consistently exhibit from two to five rooms.

The excavation of PL 30A indicated that it was probably a field house (Bertram, this volume). This conclusion derives largely from things that PL 30A does not possess: rich exterior ash and midden deposits; diverse plant remains and burned bone; or interior hearths. Such things would be expected in a year-round or cold-season occupation. At the same time, PL 30A was not simply a location from which to monitor and protect maturing crops. As Bertram has pointed out, there was much investment at this site in features — such as basins and exterior wing walls — which could have been used in the processing of harvested crops. These features suggest that PL 30A was a corporately-owned facility, reused many times over a number of years. It is likely that a corporate group which invested in the construction of such a facility would have had ownership, or at least rights to long-term use, of nearby fields.

Table 14-3. Characteristics of Prehistoric Sites in the Placitas Project Area.[1]

Site	Main Occupation Period(s)	Dates	Features	Activities and Settlement Characteristics
PL 24A	Unknown		Cobble cairn.	Lithic reduction.
PL 34A	Archaic? - Puebloan	2817 B.C.[2] 1646 B.C. 692 A.D. 956 A.D.		Multiple episodes of lithic reduction.
PL 35A	Archaic? or Puebloan	4877 B.C. 3119 B.C. 2255 B.C. 1211 B.C.		Multiple episodes of lithic reduction
PL 40A	PII		Two-room structure.	Short-term occupation (fieldhouse?); lithic reduction; food processing.
PL 50A	Puebloan?		Small structure rock alignment.	Short-term occupation (fieldhouse?).
PL 51A	Archaic? or Puebloan	2837 B.C. 1849 B.C. 1636 B.C. 1303 B.C. 1293 B.C. 569 B.C. 72 A.D.	Cobble concentration.	Lithic tool manufacture.
PL 5B	Paleo-Indian, Archaic, Puebloan?	5926 B.C. 5367 B.C. 3473 B.C. 3473 B.C. 2570 B.C. 2515 B.C. 1767 B.C.		Unknown

Table 14-3. Characteristics of Prehistoric Sites in the Placitas Project Area.[1] (Continued)

Site	Main Occupation Period(s)	Dates	Features	Activities and Settlement Characteristics
PL 25B	Archaic?, BMIII-PI	1214 B.C.	Rock alignment.	Chipped stone reduction; food processing.
PL 30A	PII	A.D. 680±345[3] A.D. 720±320 A.D. 795±430 A.D. 820±205 A.D. 910±325; 23 obsidian: Range 7276 to 14 B.C.; Mean 2999 B.C.	2-room structure; wing walls; hearths; ash dumps; cobble concentration.	Fieldhouse; agriculture.
PL 32A	PIV	A.D. 733±133 A.D. 1075±155 A.D. 1082±153 A.D. 1100±135 A.D. 1125±110 A.D. 1178±148 A.D. 1335±70 A.D. 1350±65 1434 B.C., 1315 B.C. 569 B.C., 102 B.C. 319 A.D. and 473 A.D.	2-room structure w/attached storage bin; interior hearths.	Small farmstead.
PL 38A	Archaic?, Puebloan	5708 B.C. 1420 B.C. 319 A.D. 1485 A.D., 1652 A.D.	Ash stain.	Seasonal; multi-component; lithic scatter.
PL 38B	PIV		Large, complex cobble structure; ~ 20 rooms.	Occupational site.
PL 39B	PIV		Cobble structure.	Occupational site?
PL 43B	Late PII - PIII		3-room cobble structure.	Occupational site or fieldhouse.
PL 44B	PIV		1-room cobble structure	Fieldhouse?
PL 51B	PIII		Small stone mound.	Unknown
PL 57B	early PIV		3- or 4-room cobble structure.	Occupational?
PL 68B	PIV		1-room (?) cobble structure.	Fieldhouse?

Notes:
1. After Bertram and Burgett (this volume), with modifications.
2. Dates reported without error ranges are from obsidian hydration.
3. All radiocarbon are dates reported at the 95% confidence interval and calibrated according to the tables published by Klein et al. (1982).

Table 14-4. Placitas Structural and Non-Structural Sites by Time Period.

Site Number	Structural	Non-Structural
	Basketmaker III, 400 to 700 A.D.	
PL 74A		X
PL 25B		X
	Pueblo I, 700 to 900 A.D.	
None		
	Pueblo II, 900 to 1100 A.D.	
PL 40A	X	
PL 30A	X	
PL 8A		X
	Pueblo III, 900 to 1100 A.D.	
PL 43B	X	
PL 51B	?	
PL 21B		X
	Pueblo IV, 1300 to 1600 A.D.	
PL 32A	X	
PL 38B	X	
PL 39B	X	
PL 44B	X	
PL 57B	X	
PL 68B	X	
PL 11A		X
PL 12A		X
PL 89A		X
PL 22B		X
PL 27B		X
PL 46B		X
PL 53B		X

Other than PL 40A, the other Pueblo II and Pueblo III structural sites in this area are known only from surface remains. At present, however, there is no reason to suspect that any of them represents an occupation of longer duration (e.g., year-round) than PL 30A. Despite this paucity of data, we can infer confidently, on the remains from PL 30A, that by the Pueblo II period at least parts of the Las Huertas Valley were subject to territorial claims from groups that used the area seasonally but repeatedly.

There are other Puebloan sites that were recorded by other projects. Pueblo II and III sites known from the Las Huertas area are shown below. These sites were recorded during the MAPCO (Curtis Schaafsma) and Shell CO_2 (Complete Archaeological Services Associates 1981) surveys:

	Structural Sites	Structural Elements
Pueblo II		
	LA 27635	5 rooms
	LA 25886	2 rooms
Pueblo II - Pueblo III		
	LA 25885	2 mounds
Pueblo III		
	LA 25842	Unknown
	LA 25844	2 to 5 rooms
	LA 27635	5 rooms
Pueblo III - Pueblo IV		
	LA 27675	Unknown
	LA 25884	Unknown
Pueblo IV		
	LA 25816	15 to 20 rooms
	LA 25674	Unknown (P-IV component of San Antonio de las Huertas)
	LA 25818	Mound
	LA 25848	1 room
	LA 25867	2 or 3 rooms
	LA 25880	Unknown
	LA 27633	1 room
	LA 27636	Mound
	LA 27637	3 rooms + possible kiva
	LA 27634	Mound

It is curious that PL 30A is the only site in the Las Huertas area that contains primarily intrusive ceramics. These seem to have come from the San Mateo/Grants area south to the Rio Salado and Alamocito Creek (Warren and Warren, this volume). This distribution seems to parallel that seen in the Atrisco area of the Rio Puerco (see above). It is possible that these vessels were derived by trade with the latter area, rather than directly from farther west. In either case, PL 30A provides more evidence of the widespread trade networks that operated during Pueblo II.

The Later Anasazi Occupation

After 1300 there was a major change in the way Las Huertas was used. Where previously the valley and surrounding hills had been an area of peripheral or seasonal use, it now was occupied year-round. At this time it became a population center in its own right, even if its population was small compared with the great, aggregated communities of the surrounding area.

As indicated by Tables 14-3 and 14-4 Las Huertas was used much more intensely in this period. Based on present evidence it appears that the major Pueblo IV sites in the area were LA 25816, a pueblo of 15 to 20 rooms, and PL 38B, a cobble structure of perhaps 20 rooms. Twelve other Pueblo IV sites in the area have either rubble mounds (containing an unknown number of rooms), or range from one to three or four rooms. Site LA 27637 holds a possible kiva in addition to its three rooms.

Size is not a clear indicator of the activities that took place at these sites. Despite the fact that most of these sites are small, at least some of them represent year-round occupation of the area. Site PL 32A is no larger than PL 30A, but the character of its occupation was very different. It was occupied during the cold season, as indicated by hearths in both of its rooms and it had an attached storage bin. Moreover it lacked the interior floor features that took up the floor space at PL 30A. As Bertram has suggested (this volume) this may indicate that the floor space at PL 32A was needed for indoor winter activities and for sleeping. Whether or not PL 32A was itself occupied year-round, it indicates that the Las Huertas area itself was so occupied. The winter occupation at PL 32A would have been matched by a summer farming encampment, whether at PL 32A itself, or at one of the other Pueblo IV sites in the valley.

The overwhelming source of the Pueblo IV pottery in the Las Huertas area seems to have been Tonque Pueblo, located a few miles to the northeast (Warren and Warren, this volume). This does not necessarily indicate that the Las Huertas sites were daughter communities of Tonque — although it is possible that they were — for Tonque was a manufacturing center whose wares were traded widely (Warren 1969).

The Native occupation of Las Huertas seems to have ended with the Spanish conquest. There are several sites showing use in the 16th, 17th and later centuries (Warren and Warren, this volume; Haecker and Haecker, this volume), but Marshall, Akins and Winter suggest that these represent Hispanic settlement (1986:150-151). If this is correct, then the end of Native use of Las Huertas can probably be ascribed to the population loss that resulted from the conquest. Las Huertas was no longer needed to support the now-reduced Puebloan population, and so the land was available for settlement by the newcomers.

Placitas: Assessment of the Prehistoric Occupation

Although the prehistory of the middle Rio Grande V is known in general outline, relatively less has l learned about secondary use areas such as Las Huei This is unfortunate, for the manner in which secon areas are used — whether minimally or intensively — tell us much about the kinds of problems encountere the main population aggregations. Las Huertas is ticularly informative in this regard.

As argued above, it appears that Albuquerque-area po lations, prior to about the mid thirteenth century, evo in a largely independent manner. The central Rio Gra Valley was superfluous to the more complex societies great exchange networks that developed to the west northwest. Some exchange in this direction was car on, but not of such a nature as to influence overwhe ingly the character of the archeological record.

Prior to 1300 A.D. there was a pattern of gradual cha in the use of Las Huertas. From a locale of occasio foraging expeditions it became, in the Basketmake and perhaps Pueblo I periods, an area for quarry foraging, perhaps horticulture, and temporary reside The intensity of this use increased over time. In Pueblo II and III periods Las Huertas was used in summer months for farming and processing of harve The field houses established in connection with this were unoccupied over the winter months, as peo returned in all likelihood to the major villages along Rio Grande.

Up to the middle of the thirteenth century the patter change in the use of Las Huertas can be accounted most parsimoniously as the result of slow, natural po lation growth. Once there was a major concentratio population along the Rio Grande in the Albuquerque Bernalillo areas — which seems to have been in Basketmaker III period — population growth would some point require more intensive use of secondary ar like Las Huertas.

The Pueblo IV period is characterized at Las Huertas a major discontinuity. The smooth, progressive inter fication in use of the area was broken; there was a gr increase in intensity of use. Suddenly there were ma more settlements in the area — more than all previo periods combined. The character of the occupat changed as well: sizeable settlements of 15 to 20 roo were established, and the area was now occupied ye round. Accounting for this discontinuity is at present major research problem in Las Huertas prehistory.

Three explanations can be advanced to account for the Pueblo IV discontinuity in the use of Las Huertas. They are not mutually exclusive and it may be that all three — plus, perhaps, others — were involved. The question of the Pueblo IV occupation of Las Huertas cannot be answered with Las Huertas data alone. It is a regional question, and the ideas below are put forward as suggestions for future regional research.

Alternative 1: Endemic Population Growth

The first alternative is the simplest: that the Pueblo IV use of Las Huertas resulted from the same pattern of local population growth that probably caused the area to be used in an ever-more-intensive manner in the preceding centuries. Yet the Pueblo IV discontinuity in use of Las Huertas would seem to argue against this possibility. It is possible, though, that the discontinuity is misleading. One of the tenets of the mathematical field known as Catastrophe Theory is that a continuously-changing variable can, at some point, bring a discontinuity — a major change of state (e.g., Renfrew 1979). In the present case, it could be that the continuously rising population in the Albuquerque area forced the native population in the fourteenth century to abandon the previous strategy of using Las Huertas seasonally, and to occupy it year-round. This year-round settlement would presumably have been to relieve pressure on the resource bases of major nearby communities.

Alternatives 2 and 3: Non-Local Pressures

While endemic population growth might plausibly account for the Pueblo IV use of Las Huertas, this possibility has a major weakness. Whereas it is reasonable to view cultural evolution in the Albuquerque area as relatively independent prior to the thirteenth century, it is quite impossible to do so after that time. This is because of two major events that shook the Anasazi world: the Chacoan collapse and the abandonment of the San Juan Basin. These events affected the Albuquerque area both politically and demographically, and may account for much of what we see at Las Huertas.

Alternative 2: Depopulation of the San Juan Basin

Around 1200 A.D. the central Rio Grande area was occupied by a sparse population of dispersed agriculturalists. Yet shortly thereafter there is evidence throughout the area for a dramatic rise in population — a rise so large that many scholars have concluded that it cannot be accounted for by natural, local growth. A number of archeologists have accordingly suggested that this jump in population came from the migration of San Juan Basin peoples fleeing their homeland in the thirteenth century. According to this view they settled in what were, apparently, more secure locations: the Hopi Mesas, the Zuni and Acoma areas and the middle Rio Grande drainage (e.g., Wendorf 1954a:211; Wendorf and Reed 1955:146-147; Collins 1975; Dickson 1979).

If this immigration did occur, its consequences were profound. It exerted an irreversible influence on the Rio Grande. The entire region experienced a discontinuity in evolution. Settlement patterns changed from dispersed to aggregated. Large communities formed and persisted, on a scale never before seen in this area. Social complexity grew in response to the problems posed by large aggregations of people. Ritual mechanisms of integration, such as the Kachina Cult, were adopted on a wide scale (Schaafsma and Schaafsma 1974). Irrigation systems were developed, and people intensified their use of fringe lands that previously had been underutilized (Tainter 1983). The world of the Rio Grande Anasazi had changed, and could never return to what it had been before (Tainter 1987:20).

Given these developments, the intensified use of Las Huertas may have been a response to population/resource imbalances caused by San Juan Basin populations moving into the Rio Grande. Such conditions could have made it necessary to intensify the use of lands, such as Las Huertas, that previously had been used on a seasonal basis, or viewed as supplementary resource zones. Thus we see a permanent population established in Las Huertas, living in dispersed pueblos that ranged in size up to 20 rooms.

Alternative 3: The Chacoan Collapse

The third possibility is that the local Pueblo IV developments were stimulated more by political and economic factors than by demographic and subsistence ones. The relevant factor here is the Chacoan collapse. The Chacoan system, as noted briefly above, was a regional, hierarchical society which stretched across the San Juan Basin and beyond. It was the most complex society ever to develop in the northern southwest. Like many complex societies, though, it collapsed (by the mid twelfth century) (Tainter 1988:178-187), and its demise had repercussions across many thousands of square kilometers.

Even a cursory knowledge of world history reveals the importance of what are called "core/periphery" relationships. The interaction between a dominant complex society and simpler societies on its fringes has, time and time again, strongly influenced the course of history. Several well-known cases of this process can be readily called to mind, such as:

- the north China periphery, where the interaction between nomads and settled farmers affected political evolution for millennia (Lattimore 1940);
- the Mesopotamian alluvium, where early dominant states in the Tigris and Euphrates valleys came later to be ruled by what had been a peripheral hill people: the Persians (Yoffee 1988; Service 1975);
- the Egyptian Middle Kingdom, which came to an end in 1668 B.C. with the Hyksos invasions;
- the Hittites of Anatolia, whose empire collapsed during a time of conflict with less complex peripheral peoples; and
- the interaction between central Mexican civilizations and northern barbarians, as recounted in Mesoamerican legends.

In some cases of core/periphery interaction, the collapse of the dominant center is followed by a regional dark age, typically lasting for centuries, with no power immediately gaining prominence. The Harappan, Hittite and Mycenaean collapses are prime examples as, closer to home, is the fall of Teotihuacan (Tainter 1987, 1988). In other cases, as the core declines, the evolution of complexity shifts to the periphery, so that new peoples become prominent. Two of the most famous examples are the evolution of complexity among the peoples of ancient Arabia, and somewhat later of northern Europe, following the decline of Roman power. Another example is the growth of the Puuc cities of northern Yucatan after the collapse of the southern Lowland Maya (Andrews and Sabloff 1986). It is among these latter cases that the Albuquerque area falls. The development of complexity here followed the Chacoan collapse, and was a consequence of it.

When a complex society dominates a region, the peripheral societies focus their attention on the core. It is a locus of wealth, power and prestige, and peripheral societies find it irresistible as a source of both trade and plunder. Political and economic activity <u>among</u> peripheral people tends to concentrate on the formation of supra-tribal political aggregates that can militarily challenge the center. Prime examples of this are the formation of the Germanic tribal confederations that effectively challenged the later Roman Empire, the formation of similar confederations among the peoples of the North African and Arabian deserts, and the development of the Mongol Empire (e.g., Brauer 1975:75; Grousset 1970).

(None of these is offered as an analogy for the relations of Chaco and its periphery, for there is no evidenc supra-tribal military confederations among the peo surrounding the San Juan Basin. These cases mentioned simply to illustrate the overwhelming in ence of cores on their peripheries.)

When the core collapses, however, both power <u>and</u> c petition shift to the periphery. It is to be expected t when a core collapses the formerly peripheral socie will become what Renfrew has termed "peer polit (1986) and Price has labeled "clusters" (1977). P polities are societies that interact on an approxima equal level. Classic examples are the political center Mycenaean Greece and the Maya Lowlands, the sn city-states of the Aegean and the Cyclades, or the lar societies of Medieval and Renaissance Europe. evolution of peer polities is conditioned not by a domin neighbor, but by their own mutual interaction, wh may involve both exchange and conflict. The la communities that developed in the Rio Grande a during Pueblo IV are prime candidates to have forme peer polity system.

It is unfortunate that we know so little about political economic relations among the later Rio Grande Pueb Warren (1969, 1981) has documented the existenc ceramic export industries that arose in specific comr nities, expanded, and ultimately declined. Certainly at least this level, some Rio Grande pueblos were competition. Yet there may have been much more to matter. Peer polity systems are characterized by comr nities interacting and competing, endlessly jockeying advantage, and striving either to expand at a neighb expense or to prevent having the neighbor do likev (Tainter 1988:201).

If relations of competition characterized the Rio Gra villages in the Pueblo IV period — and to some extent was certainly so — the way in which Las Huertas used in this period may be clarified. The <u>perman</u> occupation of Las Huertas may have been undertake signal a territorial claim, a claim made necessary b competitive political and economic environment and the population and resource imbalances caused by fluxes of people from the San Juan Basin.

This explanation, like the preceding two, cannot pr ently be demonstrated, but there is a powerful argum in its favor. This is that it is hard to substantiate a pu utilitarian reason for the Pueblo IV occupation of Huertas. Even with an increase in summer cultivat the agricultural produce of Las Huertas could easily h been transported a few miles to either Tonque or on the Rio Grande Pueblos. When Las Huertas was seas ally occupied in preceding centuries, the pueblo clearly managed to transport the produce for consu tion elsewhere. There is no obvious reason why they could not have continued to do so during the Pueblo IV period.

This leaves two possibilities. Either Las Huertas was occupied in the Pueblo IV period by people who were not members of a larger pueblo, or it was occupied by people from a larger pueblo largely to signal to competitors that Las Huertas was their territory. The dearth of kivas in the Las Huertas area (only one is known so far; see Table 14-5) argues against the former possibility. For ceremonialism at least, the people of Las Huertas were probably linked to one or more of the larger pueblos nearby.

The interpretation of PL 30A suggested that Las Huertas was subject to territorial claims at least as early as Pueblo II times. In the more densely-settled, competitive environment of Pueblo IV it may have been necessary to substantiate those claims by permanent occupation.

Whatever the reason for the Pueblo IV discontinuity at Las Huertas, one thing is clear: this peripheral valley was part of the larger Anasazi world covering the entire northern Southwest. Its prehistory can be understood only when it is placed within this larger context.

Ball Ranch Survey

No sites in the Ball Ranch area were tested or excavated, so our knowledge of it comes entirely from survey and surface collections. Charles Haecker has published elsewhere an excellent summary and interpretation of the Ball Ranch survey (1987). To that can be added the results of the ceramic and lithic analyses reported here (Warren and Warren, this volume; Bertram, this volume).

According to Warren's analysis, only 5 Ball Ranch sites (of 136) show evidence of occupation prior to Pueblo IV. There is one Lino Gray sherd from BA 40D; two corrugated clapboard sherds from BA 3D; one corrugated-indented oblique sherd from BA 16C; two St. John's B/w sherds from BA 21C, and one Santa Fe B/w sherd from BA 24E. The earliest of these, the single sherd of Lino Gray, could indicate occupation as early as 500 A.D. In addition, Haecker notes that the survey documented two early Archaic projectile points and two middle Archaic sites (1987:99).

In the Pueblo IV period there was an explosion in use of the area, even more dramatic than the increase in Pueblo IV occupation at Placitas. Fully 114 of the 136 sites date to this time, and particularly to the period of around 1350 to 1450. Haecker infers that all were small agricultural and/or foraging sites. He equates structural sites with agricultural sites, calling the larger ones farmsteads and the smaller ones field houses.

Defined thus, the agricultural sites tend to be situated within ravines, predominantly on the northern- or north-eastern-facing side of a drainage. Haecker suggests that such placement would both moderate spring temperature fluctuations and increase effective moisture. Most agricultural sites are situated at the confluences of secondary drainages with major washes, where there are larger alluvial fans and broader terraces. The sites at these places tend to be larger than average. Actual agricultural features include rock-mulch garden plots and rock alignments to catch water (Haecker 1987:103-104).

Most of the non-structural ceramic and lithic scatters are on the slopes and crests of ridges. These are assumed to represent foraging sites; hunting and gathering being necessary to supplement agricultural production in a marginal, unreliable area. Most such sites are coeval with the structural sites (Haecker 1987:104).

Warren's ceramic analysis (Warren and Warren, this volume) indicates that different portions of the Ball Ranch survey area contain pottery which originated in nearby major sites. Thus the southern and eastern Ball Ranch sites show a dominance of Tonque wares, with less pottery from the Espinaso Ridge site and with some intrusives from San Marcos, Gipuy and other Galisteo Basin sites. Northern Ball Ranch sites show more pottery from the Galisteo Basin, including Gipuy pueblo, and fewer Tonque wares. Sites tending toward the north and northeast portion of Ball Ranch show minor amounts of pottery from Espinaso Ridge, and proportionately more from Gipuy, San Felipe and Tonque. Haecker infers from such patterns that the Ball Ranch seasonal sites represent use of the area by populations from Tonque, Espinaso Ridge and the Galisteo Basin pueblos (1987:104-105).

In accounting for the Pueblo IV use of this area, Haecker notes that it seems coincident with the middle fourteenth century episode of population increase in the nearby Galisteo Basin. He suggests that the demands of feeding extra population spurred the use of this marginal area. Conversely, abandonment less than a century later may have the inevitable result of soil compaction, nutrient exhaustion and salt build-up, perhaps exacerbated by a major drought in the 1420s (Haecker 1987:104-105).

Bertram's lithic analysis (this volume) confirms the structural site and non-structural site dichotomy. The non-structural sites have tools with more acute edges (suitable for cutting), more exotic or rare materials, more non-cortical flakes from these materials and more bifaces. Structural sites contain tools with more obtuse edges, have less exotic material and fewer bifaces. It is clear that different activities were conducted on structural and non-structural sites.

The Pueblo IV expansion into Ball Ranch may, as at Placitas, reflect the more general processes affecting Rio Grande peoples at this time. The use of this area could be a function of natural population growth, or of a sudden jump in population following the abandonment of the San Juan Basin. Alternatively, it may reflect competitive strategies of large communities establishing claims to hinterland — even marginal hinterland. If there is anything to the last notion, then the Ball Ranch is an area where the territorial claims of several major pueblos abutted each other. How each community established and maintained its territorial claim — whether by ancestral tenure; by relations of kinship, sodality membership, or exchange; or by occupation and defense — is a fascinating and important question for future research.

Assessment of the Research Design

The research design written in 1982 (reprinted in Chapter 1) focused on population growth as a persistent factor which forced continuous cultural changes throughout the prehistory of this area. The research design was prepared for the mitigation of adverse effects to sites in the Placitas and Atrisco project areas. The Atrisco sites (AT 1A, AT 31C, AT 35C and AT 36C) were subsequently removed from the list of sites scheduled for excavation. The lands on which they are located were transferred to the city of Albuquerque with covenants ensuring that sites would be protected or excavated.

Of the Placitas sites, PL 38A was included in the research design because it was thought initially that it might contain an Archaic-period structure. Subsequent work disclosed that the rock alignment thought to demarcate the structure was a natural feature. With this discovery PL 38A became no longer pertinent to the research design, although its excavation is nonetheless reported here (Bertram, this volume).

Sites PL 30A and PL 32A figured prominently in the research design. It was thought that the establishment of these sites in the Las Huertas Valley — an area of peripheral settlement — would reflect the demographic processes that the research design specified as generating cultural change in this area. Upon excavation, PL 30A proved to be a seasonal Pueblo II field house and agricultural processing locus. PL 32A gave evidence of year-round occupation (Bertram, this volume).

It is always interesting to see how a research proposal has fared several years after it was written. In the present case, some aspects of the 1982 research design have proven quite correct and others appear utterly misguided.

The research design was most accurate in projecting th the research questions posed were regional in scope, ar that the specific sites proposed for study could not l understood in isolation. As discussed in the precedi pages, this has proved to be the case even more so th I foresaw in 1982. Not only do these sites require a Albuquerque-area context for their interpretation, th require a context extending across much of northweste New Mexico.

Where the research design failed was in supposing th the Anasazi of the Albuquerque area could be understo by studying local processes such as population growt The major influences on the area have proved not to l local at all. They have turned out to be economic ar political developments far removed from the initial field study.

While there may have been population growth betwee Basketmaker III and Pueblo IV in this area, it does n seem to have reached the point of causing major cultur changes. Instead, what we see is that as areas like La Huertas and Atrisco came to be used more heavily, th character of the occupation did not change substantiall It was only when events in northwestern New Mexi forced great changes on the Rio Grande Valley that the were major changes in the use of Las Huertas ar Atrisco.

One implication of this finding is that Albuquerque-ar sites can never again be studied in isolation. Albuque que prehistory is inextricably linked with large parts the northern Southwest. Future studies here mu accept the challenge of placing local sites in this larg context. This challenge can be daunting, but those wl accept the challenge will be able to explain much that h seemed puzzling in the prehistory of this area.

Concluding Remarks

While I don't wish to downplay the importance of the ear periods of central Rio Grande prehistory, it may l proposed that the most important puebloan developme in this area was the establishment of large, compl communities in the Pueblo IV period. Archeology h always had a bias toward the study of complex societi and spectacular sites, but readers of these remar should not conclude that I am simply another victim that bias. To the contrary: complex societies are n intrinsically more important or more worthy of stu than simpler ones.

The reason why the Pueblo IV period in the Rio Gran drainage is so important is because it represents such profound discontinuity in cultural evolution. Prior to tl thirteenth century the occupants of the Albuquerque area evolved culturally at a rate that probably reflects the consequences of slow, natural population growth. Yet by the fourteenth century the Rio Grande basin supported dense, aggregated populations and complex communities. From being on the fringe, the Rio Grande became suddenly the center of the Anasazi universe.

I have sketched above some explanations for how this may have occurred. What I wish to point out is that, if these observations and explanations have any value, their stimulus came not from the study of the major Rio Grande population centers, but from study of the marginal areas of Atrisco, Placitas and Ball Ranch. The lesson is that such fringe areas are of great importance in understanding the development of complexity. Fringe areas by definition record how successfully people used more favored areas, for a sudden increase in the use of marginal areas must indicate economic or political developments of great significance.

Fringe areas, of course, cannot be understood in isolation. This is a point made repeatedly in these pages. Conversely, though, the evolution of complex communities can never be understood without knowing how hinterlands were used. The lesson for archeologists doing future work in the area is that places like Atrisco, Placitas and Ball Ranch, seemingly peripheral, have great potential to inform us about the major evolutionary processes of Anasazi prehistory.

References

Adams, Eleanor B. (editor)

1954. Bishop Tamaron's visitation of New Mexico. *In* Historical Society of New Mexico: publications in History. Vol XV. University of New Mexico Press, Albuquerque.

Adams, Eleanor B. and Fr. Angelico Chavez

1956. The missions of New Mexico, 1776. University of New Mexico Press, Albuquerque.

Adams, Karen R.

1978. San Juan Valley Archeological Project, plant taxonomic dictionary. Ms. on file, Department of Anthropology, Eastern New Mexico University, Portales.

Akins, Nancy J.

1984. Prehistoric Faunal Utilization in Chaco Canyon: Basketmaker III Through Pueblo III. Unnumbered report of the National Park Service Chaco Center, Albuquerque, later re-released in abridged form as chapter 15 of Recent Research on Chaco Prehistory, eds. W. J. Judge and J. W. Schelberg. Reports of the Chaco Center 8.

Allan, William C.

1975. An Archeological Survey of a Floodwater Retarding Structure in the Corrales Watershed. *In* Archeological Reports, Cultural Resource Management Projects, Working Draft Series 1. F. J. Broilo and D. E. Stuart, eds., pp. 144-158. University of New Mexico, Office of Contract Archeology, Albuquerque.

Allen, J. W.

1973. The Tsogue Site Highway Salvage Excavations Near Tesuque Pueblo, New Mexico. Laboratory of Anthropology Notes 73.

Allen, Joseph W. and Charles H. McNutt.

1955. A Pit House Site Near Santa Ana Pueblo, New Mexico. American Antiquity 20:241-255.

Andrews, E. Wyllys V and Jeremy A. Sabloff

1986. Classic to Postclassic: a Summary Discussion. *In* Late Lowland Maya Civilization: Classic to Postclassic, edited by Jeremy A. Sabloff and E. Wyllys Andrews V, pp. 433-456. University of New Mexico Press, Albuquerque.

Anscheutz, Kurt F.

1987. Pueblo III Subsistence, Settlement, and Territoriality in the Northern Rio Grande: the Albuquerque Frontier. *In* Secrets of a City: Papers on Albuquerque Area Archaeology in Honor of Richard A. Bice, edited by Anne V. Poore and John Montgomery, pp. 148-164. Papers of the Archaeological Society of New Mexico 13.

Asch, Nancy B., Richard I. Ford and David L. Asch

1972. Paleoethnobotany of the Koster Site: The Archaic Horizons. Illinois State Museum Reports of Investigations 24. Illinois Valley Archeological Program, Research Papers 6.

Bailey, Jessie B.

1940. Diego de Vargas and the Reconquest of New Mexico. University of New Mexico Press, Albuquerque.

Bailey, Vernon

1931. Mammals of New Mexico. North American Fauna 53.

Barnes, Frank C.

1972. Cartridges of the World. 3rd Edition. Follett Publishing Co., Chicago.

Batchen, Lou Sage

1972. Las Placitas, historical facts and legends. Tumblewood Press, Placitas.

Batcho, David G.

1984. Obsidian Hydration Studies at the Grants Prison Sites: Dating the San Jose Complex. New Mexico State University, Cultural Resources Management Division Report 590, Las Cruces.

Beaglehole, Pearl

1937. Foods and Their Preparation. *In* Notes on Hopi Economic Life, by Earnest Beaglehole, pp. 60-71. Yale University Publications in Anthropology 15.

Beckett, P. H. and R. N. Wiseman (editors)

1979. Jornada Mogollon Archaeology: Proceedings of the First Jornada Conference. New Mexico State University, Las Cruces.

Bertram, Jack B.

n.d.a. Test Excavations at Twenty-two Prehistoric and Early Historic Sites. Ms. on file, USDA Forest Service, Southwestern Region, Cibola National Forest, Albuquerque.

n.d.b. A Re-evaluation of the Dated Obsidian Corpus from Excavations in the Casa Diablo (California) Obsidian Resource Area: Why the Oldest Obsidian is on the Surface and How to Put it Back

Where it Belongs. Manuscript on file with the author and at Chambers Group, Inc., offices in Albuquerque, NM, and Santa Ana, CA.

1987a. Obsidian Hydration, Surface Scatters, and Archaic Puebloans at Abiquiu Reservoir: High-altitude Hunting Strategic Variability and Late Large-Points. Symposium paper presented at the 1987 Pecos Conference, Pecos, New Mexico.

1987b. Persistent Archaic technologies, high altitude sites, obsidian hydration, and the Archaic-Classic continuum at Abiquiu Reservoir, New Mexico. Symposium Paper delivered at 1987 Pecos Conference, Pecos.

1988a. Faunal Analysis of Assemblages from Three Small Sites of the Kin Nizhoni Chacoan Outlier Community, with a Reconstruction of San Juan Basin Anasazi Animal Resource Strategies. Complete Archaeological Service Associates, Cortez, CO (in press).

1988b. Lithic Analysis of collections from mitigation of five loci of the Atrisco sector of the Elena Gallegos project. Ms. on file with the author and with Rio Grande Consultants, Inc., Albuquerque.

n.d.c. Intensive lithic and spatial analysis of 5800 items from the surface of Site AT-35C, a site of the Atrisco Sector, Elena Gallegos project. Manuscript in final revision for Rio Grande Consultants, Inc. Albuquerque.

Bertram, Jack B. and Neale Draper

1983. The bones from the Bis sa'ani community: a sociotechnic archaeofaunal analysis. *In* Breternitz, Doyel and Marshall. Bis sa'ani: a late Bonito Phase community on Escavada Wash, northwest New Mexico. Navajo Nation Papers in Anthropology 14.

Bertram, Jack B. with James Rancier

1989. Archaeological Investigations along the Proposed Tour Road Improvement Construction Route, Alibates Flint Quarries National Monument, Potter County, Texas. Chambers Group Inc., Albuquerque. USDI National Park Service, Southwest Region, Santa Fe (in press).

Bertram, Jack B., Jeannie Schutt, Steven Kuhn, Amy Earls, John Acklen, Charles Carillo and Jeanette Elyea

1987. Report of Surface Collection and Testing at 18 Sites Near Abiquiu Reservoir, Northern New Mexico. Mariah Associates, Inc., draft report s mitted to the U.S. Army Corps of Engine Albuquerque.

Betancourt, Julio

1980. Historical overview. *In* Reconnaissa study of the archaeological and related resou of the lower Puerco and Salado drainages, cen New Mexico. Human Systems Research, Tular New Mexico.

Biella, J. V. and R. C. Chapman (editors)

1977-9. Archaeological Investigations in Coc Reservoir, New Mexico, Vols. 1 through 4. Uni sity of New Mexico, Office of Contract Archaeol Albuquerque.

Binford, L. R.

1963. An Analysis of Three Cremations fi Michigan. *In* An Archaeological Perspective, b R. Binford. Seminar Press, New York.

Bohrer, Vorsila L.

1975a. Floristic composition of the upper Pu and Cuervo drainages, New Mexico. Ms. on Dept. of Anthropology, Eastern New Mexico U versity, Portales.

1975b. The prehistoric and historic role of cool-season grasses in the Southwest. Econo Botany 29:199-207.

1979. The changing plant resources and veg tion of the Rio Puerco, west central New mex Ms. on file, Dept. of Anthropology, Eastern I Mexico University, Portales.

Bohrer, Vorsila L. and Karen R. Adams

1977. Ethnobotanical techniques and approac at the Salmon Ruin, New Mexico. San Juan Va Archeological Project, Technical Series 2; East New Mexico University Contributions in Anth pology 8(1).

Bolton, Herbert E.

1949. Coronado on the turquoise trail, knigh pueblos and plains. Coronado Cuarto Centen Publications 1540-1940, vol. 1. University of N Mexico Press, Albuquerque.

Boserup, Ester

1965. The Conditions of Agricultural Growth: Economics of Agrarian Change Under Populat Pressure. Aldine, Chicago.

Bowden, J. J.

1969. Private land claims in the southwest. M.A. thesis, Southern Methodist University, Dallas (6 vols).

Brauer, George C., Jr.

1975. The Age of the Soldier Emperors: Imperial Rome, A.D. 244-284. Noyes Press, Park Ridge.

Breternitz, David A.

1966. An appraisal of tree-ring dated pottery in the Southwest. University of Arizona, Anthropological Papers 10.

Breternitz, Cory Dale, David E. Doyel and Michael P. Marshall

1982. Bis sa'ani: a late Bonito Phase community on Escavada Wash, northwest New Mexico, Vol. 3. Navajo Nation Papers in Anthropology 14. Navajo Nation, Cultural Resources Management Program.

Brody, J. J. and Anne Colberg.

1966. A Spanish-American Homestead Near Placitas, New Mexico. El Palacio 73(2):11-20.

Bryan, Kirk

1928. Historic evidence on changes in the channel of Rio Puerco, a tributary of the Rio Grande in New Mexico. Journal of Geology 36:265-282.

Campbell, John M. and Florence H. Ellis

1952. The Atrisco Sites: Cochise Manifestations in the Middle Rio Grande Valley. American Antiquity 17:211-221.

Castetter, E. F.

1935. Uncultivated native plants used as sources of food. Ethnobiological Studies of the American Southwest 1. University of New Mexico Bulletin Biological Series (4)1.

Chaplin, R. E.

1971. The Study of Animal Bones from Archaeological Sites. Seminar Press, New York.

Chapman, Richard C. and Jeannie Schutt

1977. Methodology of lithic analysis. *In* Archeological Investigations at Cochiti Reservoir, New Mexico, vol. 2, edited by R. A. Chapman and J. V. Biella, pp. 83 - 96. Office of Contract Archeology, University of New Mexico, Albuquerque.

Chavez, Fray Angelico

1954. Origins of New Mexico Families in the Spanish Colonial Period. Historical Society of New Mexico, Santa Fe.

Clark, Hyla M.

1977. The Tin Can Book. New American Library, New York.

Clark, Victoria S.

1949. History of Manufacturers in the United States (Vol. 11). Peter Smith, New York.

Clary, Karen H. and Anne C. Cully

1979. Pollen analysis of Block III Mitigation Project. Ms. on file, Navajo Nation Cultural Resources Management, Window Rock, Arizona. Castetter Laboratory for Ethnobotanical Studies, Technical Series 1.

Cobb, George W.

1914. The Development of the Sanitary Can. *In* A History of the Canning Industry, edited by Arthur I. Judge, pp. 94-97. The Canning Trade, Baltimore.

Cohen, Mark W.

1977. The Food Crisis in Prehistory: Overpopulation and the Origins of Agriculture. Yale University Press, New Haven.

Collins, Susan M.

1975. Prehistoric Rio Grande Settlement Patterns and the Inference of Demographic Change. Ph.D. dissertation, University of Colorado. University Microfilms, Ann Arbor.

Colton, Harold S.

1974. Hopi History and Ethnobotany. *In* Hopi Indians. Garland Publishing Inc., New York.

Complete Archaeological Services Associates

1981. Cultural Resources Inventory, Shell CO_2 Mainline. Woodward-Clyde Consultants, San Francisco.

Cook, Sarah L.

1930. The Ethnobotany of the Jemez Indians. Unpublished M.A. thesis, Department of Anthropology, University of New Mexico.

Cordell, Linda S. (editor)

1980. Tijeras Canyon: Analyses of the Past. Maxwell Museum of Anthropology and University of New Mexico Press, Albuquerque.

Curtin, L. S. M.

1949. By the Prophet of the Earth. San Vincente Foundation, Santa Fe, New Mexico.

Cushing, Frank Hamilton

1920. Zuni Breadstuff. Indian Notes and Monographs. Vol. VIII. Museum of the American Indian, Heye Foundation, New York.

Cutler, Hugh C. and Thomas W. Whitaker

1961. History and distribution of the cultivated cucurbits in the Americas. American Antiquity 26:469-485.

Daifuku, Hiroshi

1961. Jeddito 264: a Report on the Excavation of a Basket Maker III - Pueblo I Site in Northeastern Arizona, With a Review of Some Current Theories in Southwestern Archaeology. Papers of the Peabody Museum of American Archaeology and Ethnology 33(1).

Dawson, J. and W. J. Judge

1969. Paleo-Indian Sites and Topography in the Middle Rio Grande Valley of New Mexico. Plains Anthropologist 14:149-163.

Dick, Herbert

1968. Six Historic Pottery Types from Spanish Sites in New Mexico. *In* Collected Papers in Honor of Lyndon Lane Hargrave, edited by Albert H. Schroeder, pp. 77-94. Papers of the Archaeological Society of New Mexico 1.

Dickson, D. Bruce, Jr.

1979. Prehistoric Pueblo Settlement Patterns: the Arroyo Hondo, New Mexico, Site Survey. School of American Research Press, Santa Fe.

Dittert, Alfred E.

1949. The Prehistoric Population and Architecture of the Cebolleta Mesa Region, Central Western New Mexico. Unpublished M.A. Thesis, University of New Mexico, Albuquerque.

1959. Culture Change in the Cebolleta Mesa Region, New Mexico. PhD. dissertation, University of Arizona.

Dittert, Alfred E. and Reynold J. Ruppe

1951. The Archaeology of Cebolleta Mesa: a Pr liminary Report. El Palacio 58(4):116-129.

Doebley, John F. and Vorsila Bohrer

1980. Maize. *In* Investigations at the Salmon Sit the structure of Chacoan society in the northe Southwest, Vol. III, edited by Cynthia Irwin-Wi liams and Phillip H. Shelley, pp. 175-220. Easte New Mexico University, Portales, New Mexico.

Donaldson, Marcia L.

1981a. Factors affecting decomposition and co tamination of paleobotanical remains: a review floatation results from NIIP Blocks III - IX. Ms. o file, Cultural Resources Management Progran Navajo Nation, Window Rock, Arizona. Castett Laboratory for Ethnobotanical Studies, Technic Series 39.

1981b. Corn remains recovered from LA 26749, Basketmaker III site near Crownpoint, New Mexic Ms. on file, Division of Conservation Archeolog Farmington, New Mexico. Castetter Laboratory f Ethnobotanical Studies, Technical Series 37.

Donaldson, Marcia L. and Mollie S. Toll

1982. Prehistoric subsistence in the Bis sa'a community area: evidence from floatation, macr botanical remains, and wood identification. Cory Dale Breternitz, David E. Doyel and Micha P. Marshall, Bis sa'ani: a late Bonito Phase con munity on Escavada Wash. northwest New Mexic Vol. 3, pp. 1099-1180. Navajo Nation Papers Anthropology 14. Navajo Nation, Cultural R sources Management Program.

Donart, G. B., D.D. Sylvester and W. D. Hickey

1978. Potential natural vegetation, New Mexic New Mexico Inter-agency Range Committee, R port II. USDA, Soil Conservation Service.

Downton, W. J. S.

1975. The occurrence of C. photosynthesis amo plants. Photosynthetica 9:96-105.

Drake, E. L.

1936. History of Bernalillo. WPA Writers Guide New Mexico. On file at New Mexico History Librar Santa Fe.

Eidenbach, Peter L. (editor)

1982. Inventory survey of the lower Hidden Mou tain flood pool, lower Rio Puerco drainage, centr

New Mexico. Human Systems Research, Tularosa, New Mexico.

Elmore, Francis H.

1944. Ethnobotany of the Navajo. University of New Mexico Bulletin, Monograph Series 1(7).

Elyea, Janette

1987. The 1987 Field Survey. *In* MacBeth Land Exchange Archeological Survey, edited by Margaret Senter Obenauf, pp. 41-45. Ms., USDI Bureau of Land Management, Rio Puerco Resource Area, Albuquerque.

Elyea, Janette M. and Peter N. Eschman

1983. Archaic site descriptions. *In* Economy and Interaction along the Lower Chaco River, edited by Patrick A. Hogan and Joseph Winter, pp. 63-99. Office of Contract Archeology, University of New Mexico, Albuquerque.

Elyea, Janette M. and Patrick Hogan

1983. Regional interaction: the Archaic adaptation. In Economy and Interaction along the Lower Chaco River, edited by Patrick A. Hogan and Joseph Winter, pp. 393-402. Office of Contract Archeology, University of New Mexico, Albuquerque.

Ferg, Alan

1982. Historic Archaeology on the San Antonio de Las Huertas Grant, Sandoval County, New Mexico. CASA Papers 3. Complete Archaeological Services Associates, Cortez, Colorado.

Findley, James S., Arthur H. Harris, D. E. Wilson and Clyde Jones.

1975. Mammals of New Mexico. University of New Mexico Press, Albuquerque.

Fletcher, Reggie

1982. Botanical survey of Bureau of Land Management Lands designated for possible inclusion in the Elena Gallegos land exchange. Ms. on file, Division of Range Management, USDA Forest Service, Southwestern Regional Office, Albuquerque.

Fontana, Bernard L., Cameron Greenleaf, Charles W. Ferguson, Robert A. Wright, and Doris Frederick.

1962. Johnny Ward's Ranch: a study in historic archeology. The Kiva 28: 1-115.

Frisbie, Theodore R.

1967. The Excavation and Interpretation of the Artificial Leg Basketmaker III - Pueblo I Sites Near Corrales, New Mexico. Unpublished M.A. Thesis, University of New Mexico, Albuquerque.

Fritz, V.D.

1973. Settlement Patterns in the Salado Canyon, New Mexico, Pueblo I-III (850-1350 A.D.). Unpublished M.A. thesis, Eastern New Mexico University, Portales.

Gasser, Robert E.

1982. Anasazi diet. *In* Robert E. Gasser, comp., The Coronado Project archaeological investigations, the specialists' volume: biocultural analyses. Coronado Series 4; Museum of Northern Arizona Research Paper 23.

Gasser, Robert E. and E. Charles Adams

1981. Aspects of deterioration of plant remains in archeological sites: the Walpi Archaeological Project. Journal of Ethnobiology 1:182-192.

Gish, Jannifer W.

1978. Palynological Investigations at Three Archaeological Sites in the Cibola National Forest, New Mexico. Ms. on file, Dept. of Anthropology, Northern Arizona University, Flagstaff.

1982. Results from the Prewitt Project, Northwestern New Mexico. *In* Archaeological Investigations in the Eastern Red Mesa Valley: the Plains/Escalante Generating Station, compiled by John D. Beal, pp. 280-305. School of American Research, Santa Fe.

Glassow, Michael A.

1980. Prehistoric Agricultural Development in the Northern Southwest: a Study in Changing Patterns of Land Use. Ballena Press Anthropological Papers 16.

Glover, Jack

1975. The "Bobbed Wire" IV Bible. Cow Puddle Press, Sunset.

Gossett, Bill

1980. Review of Archaeological Research in the Rio Puerco-Rio Salado Watershed, N.M. *In* Reconnaissance Study of the Archaeological and Related Resources of the Lower Puerco and Salado Drainages, New Mexico, by Mark Wimberly and Peter Eidenbach, pp. 211-222. Human Systems Research, Tularosa.

Greenleaf, Richard E.

1967. Atrisco and Las Ciruelas, 1722-1769. New Mexico Historical Review 42:5-25.

Grousset, Rene

1970. The Empire of the Steppes: a History of Central Asia (translated by Naomi Walford). Rutgers University Press, New Brunswick.

Haecker, Charles M.

1976. Modes of subsistence and level of technology of the Spanish settlers in the Rio Puerco Valley, New Mexico. M.A. thesis, Eastern New Mexico University, Portales, New Mexico.

1987. Puebloan Limited Activity Sites Within the Western Uplands of the Ortiz Mountains. *In* Secrets of a City: Papers on Albuquerque Area Archaeology in Honor of Richard A. Bice, edited by Anne V. Poore and John Montgomery, pp. 99-107. Papers of the Archaeological Society of New Mexico 13.

Hall, Stephen A.

1977. Late Quaternary Sedimentation and Paleoecologic History of Chaco Canyon, New Mexico. Geological Society of America Bulletin 88: 1593-1618.

Harlow, Francis H.

1973. Matte-Paint Pottery of the Tewa, Keres and Zuni Pueblos. Museum of New Mexico Press, Santa Fe.

Harper, Allan G., Andrew R. Cordova and Kalervo Oberg

1943. Man and resources in the Middle Rio Grande Valley. Inter-American Studies II. University of New Mexico Press, Albuquerque.

Harrington, H. D.

1967. Edible native plants of the Rocky Mountains. University of New Mexico Press, Albuquerque.

Havard, V.

1895. Food plants of the North American Indians. Bulletin of the Torrey Botanical Club 22(3):98-123.

Hayes, Alden C.

1964. The Archaeological Survey of Wetherill Mesa. National Park Service Archeological Research Series, No. 7A. Washington, D.C.

1981. A Survey of Chaco Canyon Archeology. Archeological Surveys of Chaco Canyon, by Al C. Hayes, David M. Brugge, and W. James Jud pp. 1-68. USDI National Park Service, Publicati in Archeology 18A.

Hibben, Frank C.

1941. Evidences of Early Occupation in San Cave, New Mexico and other Sites in the Sand Manzano Region. Smithsonian Miscellane Collections 99(23):1-44.

Hogan, Patrick A. and Joseph Winter (editors)

1983. Economy and Interaction along the Lo Chaco River. Office of Contract Archeology, Univ sity of New Mexico, Albuquerque.

Hough, Walter

1897. The Hopi in relation to their plant envir ment. American Anthropologist 10:33-44.

Irwin-Williams, Cynthia

1973. The Oshara Tradition: Origins of Anas Culture. Eastern New Mexico University Contri tions in Anthropology 5(1).

1983. Puebloan demographic adaptation in sponse to climatic stress on the middle Rio Puer 700 A.D.-1300 A.D. Paper presented at the Anas Symposium, Salmon Ruins, Bloomfield, N Mexico.

n.d. Paleo Indian and Archaic Cultural System the Southwestern United States. *In* Handbool North American Indians. Smithsonian Instituti Washington D.C. (in press).

Irwin-Williams, C. and S. Tompkins

1968. Excavations at En Medio Shelter, N Mexico. Eastern New Mexico University Contri tions in Anthropology 1(2).

Jones, Volney

1930. The ethnobotany of the Isleta India Unpublished M.A. thesis, Department of Anth pology, University of New Mexico.

Judge, W. James

1973. PaleoIndian Occupation in the Central Grande Valley in New Mexico. University of N Mexico Press, Albuquerque.

n.d. Early Man: Plains and Southwest. *In* Ha book of North American Indians. Smithson Institution, Washington, D.C. (in press).

Kaplan, Lawrence

1956. The cultivated beans of the prehistoric Southwest. Annals of the Missouri Botanical Garden 43: 189-251.

Kelly, Robert L.

1988. The Three Sides of a Biface. American Antiquity 53: 717-734.

Kelley, Vincent and S. A. Northrup

1975. Geology of the Sandia Mountains and Vicinity, New Mexico. New Mexico Bureau of Mines and Mineral Resources, Memoir 29.

Kendrick, Grace

1971. The Antique Bottle Collector. 3rd Edition. Edward Bros., Nevada.

Kidder, Alfred Vincent

1927. The Southwestern Archaeological Conference. El Palacio 23:554-561.

1932. The Artifacts of Pecos. Robert S. Peabody Foundation for Archaeology, Andover, Massachusetts; Carnegie Institution, Washington, DC.

Kidder, Alfred V. and Anna O. Shepard

1936. The Pottery of Pecos Pueblo, Volume 2. Papers of the Phillips Academy Southwestern Expedition 7. New Haven.

Klein, Jeffrey, J. C. Lerman, P. E. Damon and E. K. Ralph

1982. Calibration of Radiocarbon Dates: Tables Based on the Consensus Data of the Workshop on Calibrating the Radiocarbon Time Scale. Radiocarbon 24:103-150.

Knudson, Ruthann

1982. Addendum No. 7, Cultural Resource Inventory, Shell/Mobil CO_2 Pipeline - New Mexico: Additional Mainline Data, New Mexico. Ms., Woodward-Clyde Consultants, San Francisco.

Kovel, Ralph M. and Terry H. Kovel

1974. Dictionary of Marks: Pottery and Porcelain. Crown Publishers, Inc., New York.

Krenetsky, John C.

1964. Phytosociological study of the Picuris Grant and ethnobotanical study of the Picuris Indians. Unpublished M.S. thesis, Department of Biology, University of New Mexico.

Lang, Richard W. and Arthur H. Harris

1984. The Faunal Remains from Arroyo Hondo Pueblo, New Mexico. School of American Research, Santa Fe.

Lange, Charles H., Carrol L. Riley and Elizabeth M. Lange (editors)

1975. The Southwestern Journals of Adolph F. Bandelier, 1885-1888. School of American Research, Santa Fe.

Lattimore, Owen

1940. Inner Asian Frontiers of China. Beacon Press, Boston.

LeBlanc, Steven A.

1980. The Early Pithouse Period. *In* An Archeological Synthesis of South-Central and Southwestern New Mexico, by Steven A. LeBlanc and Michael E. Whalen, pp. 119-141. Ms. on file, UDSA Forest Service, Southwestern Regional Office, Albuquerque.

Lee, Richard B.

1972. Population Growth and the Beginnings of Sedentary Life Among the !Kung Bushmen. *In* Population Growth: Anthropological Implications. B. Spooner, ed., pp. 329-342. Massachusetts Institute of Technology Press, Cambridge.

Lord, Kenneth J., Nancy S. Cella and Jack B. Bertram

1987. Archaeological and Historical Research at Abiquiu Dam Reservoir, Rio Arriba County, New Mexico. Chambers Group, Inc., revised draft report in three volumes submitted to the U.S. Army Corps of Engineers, Albuquerque.

Lorrain, D.

1968. An Archeologist's Guide to Nineteenth Century American Glass. Historical Archaeology 2:35-44.

Lyons, Thomas R.

1969. A Study of Paleo-Indian and Desert Culture Complexes of the Estancia Valley Area, New Mexico. Ph.D. dissertation, University of New Mexico. University Microfilms, Ann Arbor.

Madsen, David B.

1979. The Fremont and the Sevier: defining prehistoric agriculturalists north of the Anasazi. American Antiquity 44:711-722.

Marshall, Michael P., Nancy J. Akins and Joseph C. Winter

1986. The 1983 Cultural Resources Monitoring and Data Recovery Project for the Cortez CO_2 Pipeline in the Las Huertas Valley Area. University of New Mexico, Office of Contract Archeology, Albuquerque.

Marshall, M. P., J. R. Stein, R. W. Loose and J. E. Novotny

1979. Anasazi Communities of the San Juan Basin. Public Service Company of New Mexico and New Mexico State Historic Preservation Bureau, Albuquerque and Santa Fe.

Marshall, Michael P. and Henry J. Walt

1984. Rio Abajo: Prehistory and History of a Rio Grande Province. New Mexico Historic Preservation Program, Santa Fe.

Martin, William C. and C. Robert Hutchins

1981. A flora of New Mexico. J. Cramer, Braunschweig, W. Germany.

Matthews, K.

1987. Placitas. Impact Magazine, Albuquerque Journal, Feb. 24.

Meinig, D. W.

1971. Southwest: three peoples in geographical change, 1600-1970. Oxford University Press, New York.

Mera, H. P.

1933. A Proposed Revision of the Rio Grande Glaze Paint Sequence. Laboratory of Anthropology Technical Series, Bulletin 5. Santa Fe.

1935. Ceramic Clues to the Prehistory of North Central New Mexico. Laboratory of Anthropology Technical Series, Bulletin 8. Santa Fe.

1940. Population Changes in the Rio Grande Glaze-Paint Area. Laboratory of Anthropology Technical Series, Bulletin 9. Santa Fe.

1943. An Outline of Ceramic Developments in Southern and Southeastern New Mexico. Laboratory of Anthropology Technical Series, Bulletin 11. Santa Fe.

Michels, Joseph W.

1984a. The hydration rate for Pumice Mountain (Mt. Taylor) obsidian at archaeological sites in the Grants Canyon area of New Mexico. MOH Technical Report No. 24, revised (original i 1983). State College, PA.

1984b. Hydration rate constants for Rio Gr Gravels Group 3523: Sandoval County, New Me MOHLAB Technical Report No. 41. State Col PA.

1984c. Hydration rate constants for Rio Gr Gravels Group 3500: Sandoval County, New Me MOHLAB Technical Report No. 40. State Col PA.

1984d. Hydration rate constants for Rio Gr Gravels Group 3530: Sandoval County, New Me MOHLAB Technical Report No. 42. State Col PA.

1984e. Hydration Rate Constants for Rio Gr Gravels Group 3525/3520, Sandoval County, Mexico. MOHLAB Technical Report No. 39.

1985. Hydration rate constants for Obsidian Ri Rabbit Mountain (Jemez) obsidian: Sand County, New Mexico. MOHLAB Technical Re No. 39 revised (original issue 1984). State Col PA.

1987. Hydration rate constants for Cerr Medio (Jemez Mtn.) obsidian: Sandoval Co New Mexico. MOHLAB Technical Report N revised (original issue 1984). State College,

Montgomery, John and Ann Poore (editors)

1987. Secrets of a City: Papers on Albuque Area Archaeology in Honor of Richard A. Papers of the Archaeological Society of New M 13.

Music, Steve

1971. Prince Albert. Tin Type 1(7):54.

Nequatewa, Edmund

1943. Some Hopi Recipes for the Preparati Wild Plant Foods. Plateau 16(1):18-20.

Newman, T. Stivell

1970. A Dating Key for Post Eighteenth Cer Bottles. Historical Archeology 4:70-75.

Nickerson, Norton H.

1953. Variation in cob morphology among ce archaeological and ethnological races of m Annuals of the Missouri Botanical Garden 4 111.

Nordby, Larry

1981. Non-destructive archeology at Sliding Rock Ruin: an experiment in the methodology of the conservation ethic. Southwest Cultural Resource Center, National Park Service, Santa Fe.

Pattison, Natalie

1968. Nogales Cliff House: a Largo-Gallina site. Unpublished M.A. thesis, Department of Anthropology, University of New Mexico, Albuquerque.

Pearce, T. M. (editor)

1965. New Mexico place names, a geographical dictionary. University of New Mexico Press, Albuquerque.

Peckham, Stewart

1954. A Pueblo I Site Near San Felipe Pueblo, New Mexico. *In* Highway Salvage Archaeology. F. Wendorf, ed., pp. 41-51. New Mexico State Highway Department and Museum of New Mexico, Santa Fe.

1957. Three Pithouse Sites Near Albuquerque, New Mexico. *In* Highway Salvage Archaeology, Volume III. S. Peckham, ed., pp. 39-70. New Mexico State Highway Department and Museum of New Mexico, Santa Fe.

1976. Taylor Draw: A Mogollon-Anasazi Hybrid? *In* Collected Papers in Honor of Marjorie Ferguson Lambert, Albert H. Schroeder, editor, pp. 37-68. Papers of the Archaeological Society of New Mexico 3. Albuquerque.

1987. Not in the Limelight but Never in the Shadow: Preliminary Observations on Prehistoric Sites South of Mesa Prieta, New Mexico. *In* Secrets of a City: Papers on Albuquerque Area Archaeology in Honor of Richard A. Bice, edited by Anne V. Poore and John Montgomery, pp. 87-97. Papers of the Archaeological Society of New Mexico 13.

Petersen, Kenneth Lee

1981. 10,000 Years of Climatic Change Reconstructed from Fossil Pollen, La Plata Mountains, Southwestern Colorado. Unpublished Ph.D. dissertation, Department of Anthropology. Washington State University, Pullman.

Pippin, Lonnie C.

1979. The prehistory and paleoecology of Guadalupe Ruin, Sandoval County, New Mexico. Unpub. Ph.D. dissertation, Dept. of Anthropology, Washington State University, Pullman.

Pippen, Lonnie C.

1987. Prehistory and Paleoecology of Guadalupe Ruin, New Mexico. University of Utah Anthropological Papers 107.

Price, Barbara

1977. Shifts of Production and Organization: a Cluster Interaction Model. Current Anthropology 18:209-234.

Raish, Carol

n.d. Excavated Sites FA 3-6, FA 1-6, FA 3-3. Ms. on file, USDA Forest Service, Southwestern Region, Elena Gallegos Project, Albuquerque

Reagan, Albert B.

1928. Plants used by the White Mountain Apache of Arizona. The Wisconsin Archeologist 8(4):143-161.

Reinhart, Theodore R.

1967. Late Archaic Cultures of the Middle Rio Grande Valley: a Study of the Process of Culture Change. Ph.D. dissertation, University of New Mexico. University Microfilms, Ann Arbor.

Renfrew, Colin

1979. Systems Collapse as Social Transformation: Catastrophe and Anastrophe in Early State Societies. *In* Transformations: Mathematical Approaches to Culture Change, edited by Colin Renfrew and Kenneth L. Cooke, pp. 481-506. Academic Press, New York.

1986. Introduction: Peer Polity Interaction and Socio-Political Change. *In* Peer Polity Interaction and Socio-Political Change, edited by Colin Renfrew and John F. Cherry, pp. 1-18. Cambridge University Press, Cambridge.

Robins, J. S. and C. E. Domingo

1953. Some effects of severe soil moisture deficits at specific growth states in corn. Agronomy Journal 45:618-621.

Robbins, W. W., J. P. Harrington and Barbara Freire-Marreco

1916. Ethnobotany of the Tewa Indians. Bureau of American Ethnology, Bulletin 55. Government Printing Office, Washington, D.C.

Rock, Jim T.

1978. Tin Canister Identification: Tin Cans, Yreka.

Schaafsma, Polly and Curtis F. Schaafsma

1974. Evidence for the Origins of the Pueblo Katchina Cult as Suggested by Southwestern Rock Art. American Antiquity 39:535-545.

Schelberg, John D.

1982. Economic and Social Development as an Adaptation to a Marginal Environment in Chaco Canyon, New Mexico. Ph.D. dissertation, Northwestern University. University Microfilms, Ann Arbor.

Schmader, Matthew F.

1988. Data Recovery Program and Resource Management Plan for Four Archaeological Sites in the Elena Gallegos Land Exchange, Rio Puerco Valley. Ms., Rio Grande Consultants, Albuquerque.

1990. Archaeological Data Recovery at Five Sites Near Cerro Colorado in the Elena Gallegos Land Exchange, Rio Puerco Valley, NM. Ms., Rio Grande Consultants, Albuquerque.

Schorsch, Russel, L.

1962. A Basketmaker III Pithouse near Albuquerque. El Palacio 69(2):114-118.

Schutt, Jeannie

1980. The analysis of wear patterns from the use of flake tools in manufacturing and processing activities: a preliminary report. *In* Human Adaptations in a Marginal Environment: the UII Mitigation Project, edited by James L. Moore and Joseph Winter, pp. 66 - 93. Office of Contract Archeology, University of New Mexico, Albuquerque.

1983. The analysis of formal tools from the NMAP Sites: new methods of data retrieval. *In* Economy and Interaction along the Lower Chaco River, edited by Patrick A. Hogan and Joseph Winter, pp. 263 - 272. Office of Contract Archeology, University of New Mexico, Albuquerque.

1986. Formal tool analysis. *In* Draft Final Report for the Border Star 85 Survey, assembled by Tim J. Seaman, William H. Doleman, and Richard C. Chapman, pp. 10:1 - 10:60. Office of Contract Archeology, University of New Mexico, Albuquerque.

n.d. Farmington Area Lithic Analysis. Ms. on file, USDA Forest Service, Cibola National Forest, Albuquerque, New Mexico.

Schutt, Jeannie, and Bradley J. Vierra

1980. Lithic analysis methodology. *In* Hum Adaptations in a Marginal Environment: the Mitigation Project, edited by James L. Moore a Joseph Winter, pp. 45 - 65. Office of Contr Archeology, University of New Mexico, Albuqu que.

Scott, Linda J.

1983a. A Model for the Interpretation of Pitstructu Activity Areas at Anasazi Sites (Basketmaker Pueblo I) Through Pollen Analysis. M.A. the Dept. of Anthropology, University of Colora Boulder.

1983b. Pollen Analysis from Selected Sites in Eastern Red Mesa Valley, New Mexico. Ms. on with School of American Research, Santa Fe.

Scurlock, Dan

1983. An investigation of the historical cultu resources of the Las Huertas Valley, Sando County, New Mexico. Report submitted to Office of Cultural Affairs, Historic Preservat Division, Santa Fe.

Seaman, Tim J., William H. Doleman, and Richard Chapman (assemblers)

1989. Draft Final Report for the Border Star Survey. Office of Contract Archeology, Univers of New Mexico, Albuquerque.

Service, Elman R.

1975. Origins of the State and Civilization: Process of Cultural Evolution. Norton, New Yo

Sharp, D. D.

1936. Cedar Crest. On file at State Histori Library, Cedar Crest file, Santa Fe.

Shepard, Anna O.

1936. The Technology of Pecos Pottery. *In* Pottery of Pecos, Vol. II, by A. V. Kidder. Y University Press, New Haven.

1942. Rio Grande Glaze-Paint Ware. Carne Institution of Washington, Contributions to Am can Anthropology and History 39.

Simpson, James H.

1852. Journal of a military reconnaissance fr Santa Fe, New Mexico, to the Navajo coun Philadelphia.

Skinner, S. Alan

1965. The Sedillo Site: a Pithouse Village in Albuquerque. El Palacio 72(1):5-24.

Smith, Alexander H.

1975. A field guide to western mushrooms. University of Michigan Press, Ann Arbor.

Smith, Andrew T.

1973. The people of the San Antonio de Las Huertas Grant, New Mexico, 1767-1900. Ms. on file, Laboratory of Anthropology, Santa Fe.

Snow, C. Thomas

1979. Historical interpretation: eighteenth century sites. *In* Archeological investigations in Cochiti Reservoir, New Mexico, Volume 4: Adaptive change in the northern Rio Grande Valley, edited by Jan V. Biella and Richard C. Chapman. University of New Mexico, Office of Contract Archeology, Albuquerque.

Spooner, B. (editor)

1972. Population Growth: Anthropological Implications. Massachusetts Institute of Technology Press, Cambridge.

Stearns, Charles E.

1953. Tertiary Geology of the Galisteo-Tonque Area, New Mexico. Geological Society of American Bulletin (64):459-507.

Stevenson, Matilda Coxe

1915. Ethnobotany of the Zuni Indians. Thirtieth Annual Report of the Bureau of American Ethnology:31-102. Government Printing Office, Washington, D.C.

Stiger, Mark A.

1977. Anasazi diet: the coprolite evidence. Unpublished M.A. thesis, Department of Anthropology, University of Colorado, Boulder.

Struever, Mollie

1977. Relation of floatation analysis to archeological sites, Chaco Canyon, New Mexico. Final report site 29SJ627. Final report, site 29SJ627. Ms. on file, Chaco Center, National Park Service, Santa Fe.

1979. Evidence of ancient and modern human behavior in flotation remains from Howiri Pueblo. Ms. on file, Laboratory of Anthropology, Museum of New Mexico, Santa Fe. Castetter Laboratory for Ethnobotanical Studies, Technical Series 4.

1981. Vegetal materials recovered during stabilization of sliding Rock Ruin, Canyon de Chelley National Monument. *In* Non-destructive archeology at Sliding Rock Ruin: an experiment in the methodology of the conservation ethic, by Larry Nordby. Southwest Cultural Resource Center, National Park Service, Santa Fe.

Struever, Stuart

1968. Floatation techniques for the recovery of small scale archeological remains. American Antiquity 33:353-362.

Swank, G. R.

1932. The Ethnobotany of the Acoma and Laguna Indians. Unpublished M.A. thesis, Department of Anthropology, University of New Mexico.

Syvertsen, J. P., G. L. Nickell, R. W. Spellenberg and G. L. Cunningham

1976. Carbon reduction pathways and standing crop in three Chihuahuan Desert plant communities. Southwestern Naturalist 21:311-320.

Tainter, Joseph A.

1979a. The Mountainair Lithic Scatters: Settlement Patterns and Significance Evaluation of Low Density Surface Sites. Journal of Field Archaeology 6: 463-469.

1979b. Cultural Evolution in the Jornada Mogollon Area. *In* Jornada Mogollon Archaeology: Proceedings of the First Jornada Conference. P. H. Beckett and R. N. Wiseman, eds., pp. 377-382. New Mexico State University, Las Cruces.

1983. Prehistoric Settlement in the Las Huertas Valley of New Mexico. Paper presented at the Annual Conference of the Historical Society of New Mexico, Albuquerque.

1984. Perspectives on the Northern Mogollon Boundary Phenomenon. *In* Recent Research in Mogollon Prehistory, edited by Steadman Upham, Fred Plog, David G. Batcho, and Barbara E. Kauffman, pp. 45-58. New Mexico State University Museum Occasional Paper 10.

1987. The Development and Collapse of Prehistoric Societies: a Perspective From Central New Mexico. *In* Secrets of a City: Papers on Albuquerque Area Archaeology in Honor of Richard A. Bice, edited by Anne V. Poore and John Montgomery, pp. 18-24. Papers of the Archaeological Society of New Mexico 13.

1988. The Collapse of Complex Societies. Cambridge University Press, Cambridge.

Tainter, Joseph A. and David "A" Gillio

1980. Cultural Resources Overview Mt. Taylor Area, New Mexico. USDA Forest Service, Southwestern Regional Office, and USDI Bureau of Land Management, New Mexico State Office, Albuquerque and Santa Fe.

Tainter, Joseph A. and Fred Plog

1990. Writing and Rewriting Southwestern Prehistory. Paper prepared for the School of American Research/Santa Fe Institute Advanced Seminar "The Organization and Evolution of Southwestern Prehistoric Society," Santa Fe (revised).

Thoms, Alston V.

1977. A Preliminary Projectile Point Typology for the Southern Portion of the Northern Rio Grande Region, New Mexico. M.A. thesis, Texas Tech University, Lubbock.

Toll, Mollie S.

1981a. Floatation remains from two hearths: the McBeth land exchange survey area, Puerco River Valley, New Mexico. Castetter Laboratory for Ethnobotanical Studies, Technical Series 51. Ms. on file, Bureau of Land Management, Rio Puerco Resource Area, Albuquerque.

1981b. A preliminary investigation of botanical remnants of subsistence at Rowe Pueblo. Ms. on file, University of New Mexico, Department of Anthropology. Castetter Laboratory for Ethnobotanical Studies, Technical Series 33.

1982a. Floatation and macro-botanical analyses at 29SJ629: a Pueblo I-II village in Chaco Canyon. Ms. on file at Chaco Center, National Park Service, Santa Fe. Castetter Laboratory for Ethnobotanical Studies, Technical Series 49.

1982b. Floatation analysis of outlying structures of Nuestra Senora de Dolores Pueblo (LA-677). *In* Michael P. Marshall, Excavations at Nuestra Senora de Dolores Pueblo (LA-677), a prehistoric settlement in the Tiguex province. Office of Contract Archeology, Albuquerque.

1983. Prehistoric subsistence and environment at Gallina area sites, north-central New Mexico: evidence from floatation and macro-botanical studies. Ms. on file, Ghost Ranch Museum, Abiquiu, New Mexico. Castetter Laboratory for Ethnobotanical Studies, Technical Series 60.

1984. Changing patterns of plant utilizatio food and fuel: evidence from floatation and ma botanical remains. *In* Patrick Hogan and Jo C. Winter, eds., Economy and interaction alon Lower Chaco River: the Navajo Mine Archeolo Program, Mining Area III. Office of Contrac cheology, Albuquerque.

n.d. Plant utilization at a Chacoan town Pueblo Alto. Chaco Center, National Park Ser Santa Fe (ms. in preparation).

Toulouse, Julian Harrison

1972. Bottle Makers and Their Marks (se edition). Thomas Nelson, Inc., New York.

Twitchell, R. E.

1914. The Spanish archives of New Mexico. T Press, Cedar Rapids, Michigan.

U.S. Department of Agriculture

1974. Field guide to native vegetation of Southwestern Region. U.S. Department of culture, Forest Service, Southwestern Reg Office, Albuquerque.

Vivian, R. Gwinn and Nancy W. Clendenen

1965. The Denison Site: Four Pit Houses Isleta, New Mexico. El Palacio 72(2):5-26.

Ward, A. E., E. K. Abbink and J. R. Stein

1977. Ethnohistorical and Chronological Bas Navajo Material Culture. *In* Settlement and sistence along the Lower Chaco River, edite Charles A. Reher, pp. 217-279. The Universi New Mexico Press, Albuquerque.

Warren, A. H.

1967. Cochiti Dam Salvage Project: Archeolo Excavation and Pottery of Las Majadas Site 591, Cochiti Dam, New Mexico. Museum of Mexico, Laboratory of Anthropology Notes 75

1968. Petrographic Notes on Glaze-Paint Pot *In* The Cochiti Dam Archaeological Salvage Pro Part 1: Report on the 1963 Season, assemble Charles H. Lange, pp. 184-197. Museum of Mexico Research Record 6.

1969. Tonque: Glaze Pottery Industry. El Pal 76(2):36-42.

1974. The Pottery and Mineral Resources of Pu del Encierro (LA 70) and the Cochiti Area. Mus of New Mexico, Laboratory of Anthropology N 98.

1977a. Geology and Prehistoric Mineral Resources: White Rock Canyon and the Cochiti Study Area, Sandoval County, New Mexico. *In* Archaeological Investigations in Cochiti Reservoir, New Mexico, Vol. 1 (pp 15 to 30). Edited by J. V. Biella and R. C. Chapman. University of New Mexico, Office of Contract Archaeology, Albuquerque.

1977b. Early Redwares of the Middle Rio Grande Valley. Pottery Southwest 4(2): 7.

1979a. Geological and Mineral Resources of the Cochiti Reservoir Area. *In* Archeological Investigations in Cochiti Reservoir, New Mexico, Volume 4: Adaptive Change in the Northern Rio Grande Valley, edited by Jan V. Biella and Richard C. Chapman, pp. 47-60. Office of Contract, University of New Mexico, Albuquerque.

1979b. Untitled presentation at the Lithics Identification and Quarry Source Workshop, sponsored by the Cultural Resources Management Division, New Mexico State University, Las Cruces. Copies on file at the Office of Contract Archeology, University of New Mexico, Albuquerque, and the Division of Cultural Research, USDI National Park Service, Santa Fe.

1979c. Historic Pottery of the Cochiti Reservoir Area. *In* Archeological Investigations in Cochiti Reservoir, New Mexico, Volume 4: Adaptive Change in the Northern Rio Grande Valley, edited by Jan V. Biella and Richard C. Chapman, pp. 235-246. Office of Contract Archeology, University of New Mexico, Albuquerque.

1979d. The Glaze Paint Wares of the Upper Middle Rio Grande. *In* Archeological Investigations in Cochiti Reservoir, New Mexico, Volume 4: Adaptive Change in the Northern Rio Grande Valley, edited by Jan V. Biella and Richard C. Chapman, pp. 187-216. Office of Contract Archeology, University of New Mexico, Albuquerque.

1981. A Petrographic Study of the Pottery of Gran Quivira. *In* Contributions to Gran Quivira Archeology, edited by Alden C. Hayes, pp. 67-73. USDI National Park Service, Publications in Archeology 17.

1985. The Pottery From Surface and Other Testing Units, LA 15260, Coors Road, Bernalillo County, New Mexico. Ms., Laboratory of Anthropology, Museum of New Mexico, Santa Fe.

Washburn, Dorothy K.

1972. An Analysis of the Spatial Aspects of the Site Locations of Pueblo I-III Sites Along the Middle Rio Puerco, New Mexico. Ph.D. dissertation, Columbia University.

1974. Nearest Neighbor Analysis of Pueblo I-III Settlement Patterns Along the Rio Puerco of the East, New Mexico. American Antiquity 39:315-335.

Watson, Patty Jo

1976. In pursuit of prehistoric subsistence: a comparative account of some contemporary floatation techniques. Mid-Continental Journal of Archaeology 1:77-100.

Wendorf, Fred

1954a. A Reconstruction of Northern Rio Grande Prehistory. American Anthropologist 56:200-227.

1954b. A Pueblo II site near Laguna, New Mexico. *In* Fred Wendorf, ed., Highway salvage archaeology, Vol. I., pp. 13-28. New Mexico State Highway Department and Museum of New Mexico.

Wendorf, F. (editor)

1954c. Highway Salvage Archaeology. New Mexico State Highway Department and Museum of New Mexico, Santa Fe.

Wendorf, Fred and Erik Reed

1955. An Alternative Reconstruction of Northern Rio Grande Prehistory. El Palacio 62:131-173.

White, Marjorie

1973. Golden Rose From First Gold Rush. El Paso Times Sunday Magazine, March 4:2-3.

Whiting, Alfred F.

1939. Ethnobotany of the Hopi. Museum of Northern Arizona Bulletin 15.

Widdison, J. G.

1958. Historical Geography of the middle Rio Puerco Valley, New Mexico. M.A. thesis, University of Colorado, Boulder.

Wimberly, Mark and Peter Eidenbach

1980. Reconnaissance Study of the Archaeological and Related Resources of the Lower Puerco and Salado Drainages, New Mexico. Human Systems Research, Tularosa.

Wood, W. Raymond and Donald Lee Johnson

1978. A survey of disturbance processes in archeological site formation. *In* advances in archaeological method and theory, Vol. I., edited by Michael Schiffer, pp. 315-381. Academic Press, New York.

Wyckoff, Don G.

1977. Secondary Forest Succession Following Abandonment of Mesa Verde. The Kiva 42(3-4):215-231.

Yoffee, Norman

1988. The Collapse of Ancient Mesopotan States and Civilizations. *In* The Collapse of Anc States and Civilizations, edited by Norman Yo and George L. Cowgill, pp. 44-68. Universit Arizona Press, Tucson.

Zipf, George K.

1949. Human Behavior and the Principle of L Effort: an Introduction to Human Ecology. Addis Wesley, Reading.

Appendix 8-1 • Atrisco Data and Observations

The codes below are the Atrisco Data and Observation Codes used in the following table of Atrisco data listings and observations (see page 406).

Taxon

AMMO	*Ammospermophilus*
ARTIO	artiodactyl
B/M	bird or mammal
CAN	*canadensis*
COLUB	Colubridae
CRIC	Cricetidae
D	*Dipodomys*
HEM	*hemionus*
HETEROM	Heteromyidae
I=INDET	indeterminate
LAG	lagomorph
M	medium or mammal (see context)
M/L	medium to large
O	*Odocoileus* or *Ovis*
ODOC	Odocoileus
OVICAP=OP	*Ovis aries* or *Capra hirca*; *Ovis canadensius* (unlikely)
ref	referred to
S	small
S/M	small or medium
so	size of
SYLV	*Sylvilagus*
THOMO	*Thomomys*
UNID	unidentified but identifiable
?	moderate certainty or unknown (see context)

Skeletal Element

ACET	acetabulum
BULL	auditory bulla
CALC	calcaneum
CANC	cancella
EGSHL	eggshell
FEM	femur
FIB	fibulary
FRON	frontal
HUM	humerus
ILIU	ilium
INNO	innominate
ISCH	ischium
LB	long bone
MAND	mandible
MAX	maxilla
MC(#)	metacarpal (number if known)
MP	metapodial
MT(#)	metatarsal (number if known)
NAVI	navicular
OCCI	occipital
PALA	palatal
PH	phalanx, joint, pes or manus, digit (#(P or M(#)) (if known)
PH(M or L(#))	phalanx, medial or lateral, joint (if known)
PLAT	platey
PRMX	premaxilla
RAD	radius
RIB(#)	rib (number if known)
SCAP	scapula
SHEL	shell
SKUL	skull
TAL	talus
TEMP	temporal
TIB	tibia
TOTH	tooth
VER C / T (#) / L	vertebra: cervical, thoracic, or lumbar, and number if known
ZYGO	zygoma
?	uncertain

Portion Codes

A	anterior
C	complete
D	distal
D+S	distal and shaft
F	fragment
I	incisor
L	lower
M	molar
NC	nearly complete
NP	neural process
P	proximal
PM	premolar
P+S	proximal and shaft
S	shaft
U	upper
?	uncertain
-	no significant data

Fusion, Age, Size, and Sex Codes

A	adult
f	probable female
F	fused
J	juvenile
L	large
m	probable male
M	mature
N	infant, foetal, or very young
O	old
P	partially
S	small
U	unfused
v.	very
Y	young
?	uncertain

Burning Codes

B	black
BB	broken before burning
Bl	blue
Br	brown
CA	chalky
FB	burned fresh or in-flesh
G	gray
H	hard or porcelainized
PB	broken after burning
R	roasted
T	tan or cream
V	variable
W	white
?	uncertain
-	unburned

Condition Codes

AP	artificial polish
BM	bonemeal
C	cutmark
CR	friable
DG	dog gnawing
ER	eroded
FR	fresh
GP	gastric polish or evidence of scat
HG	human gnawing
KR	crushed
LE	leached
m	moderate to light
PT	pitted
RD	rodent and dog or human gnawin
RL	rodent gnawing and dog licking
SE	surface exposure weathering
v.	very
WE	weathered (inspecific)
WO	worm damage
?	uncertain
no entry	archeological; extremes of condition absent or obscured by burne state

Notes

1.	Possible bead fragment
2.	Calcium? deposits
3.	Very rarely recovered
4.	Scat or pellet?
5.	Canid "toy"
6.	Bead
7.	Polished and incised pendant.

Table of Atrisco Data Listings and Observations

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
1A	so 25	SYLV	2	MT?	SF	?	?	CA.W	LE	
	31	ISM	1	LB	SF	?	?	H.BIG	AP?	1
	50	refLEPUS	2	RAD?	SF	?	?	CA.Br	LE	
	55	ISM	2	LB	SF	?	?	CA.W	-	
		ISM	2	LB	SF	?	?	CA.Br	LE	
	56	refSYLV	2	TIB?	SF	?	?	CA.T	LE	
	58	soSYLV	2	LB	SF	?	?	CA.T	LE	
		soSYLV	1	LB	SF	?	?	CA.B	C?AP?	
	59	LEPUS	1	MAX	F	R	?	H.B	—	2
		LEPUS	1	ISCH	F	R	?	CA.G	-	
		LEPUS	1	MT	D	?	F	H.B.	-	
		LEPUS	1	PH2P	PF	?	F	-	LE	
		LAG	1	TOTH	F	?	?	H.W	-	
		ISM	1	SCAP?	F	?	?	R	-	
		soLAG	29	LB	SF	?	?	V.G	-	
		soLAG	3	LB	SF	?	?	-	LE	
		and two pumice fragments, burned								
	63	refSYLV	1	RAD	SF	?	?	CA.W	-	
		ISM	2	LB	SF	?	?	CA.T	LE	

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
	64	SYLV	*2	RAD	P	L	?	CA.T	-	
		and one piece of caliche								
	104	AMMOSPER?	1	TIB	S	L	?	-	v.ER	
		A.CRICET?	1	HUM	D+S	?	?	—	v.ER	
		SYLV	2	MAND	SF	?	?	H.GB	-	
		SYLV	1	MAND	PF	R	?	CA.W	-	
		SYLV	*3	MT2	C	L	F	-	ER	
		LEPUS	1	INNO	D+S	L	F?	H.B	-	
		ISM -	14	?	F	?	?	-	ER.RE	
		refLAG	39	LB?	SF	?	?	V.GB	-	
	105	SYLV?	1	MP	DF	?	?	H.W	—	
		soSYLV	11	LB	SF	?	?	V.BG	-	
		soSYLV	2	SCAP	F	?	?	-	LE	
		soSYLV	4	LB	SF	?	?	-	LE	
		LEPUS	1	ULNA	P	L	FL	CA.GB	LE	
	113	SYLV	1	RAD	SF	?	?	CA.BrT	LE	
		SYLV	1	ILIU	F	R	?	H.BIG.BB	LE	
		soSYLV	1	FEM?	SF	?	?	H.B	-	
		soSYLV	1	MC?	SF	?	?	-	v.ER	
		ISM	1	?	F	?	?	-	v.ER	
		ISM	3	LB	SF	?	?	CA.T	LE	
	123	soLAG	1	MP	P+SF	?	?	CA.BG	-	
		soLAG	1	LB	SF	?	?	CA.BG	-	
	126	ISM	1	?	F	?	?	R	-	
	135	ISM	*2	LB	SF	?	?	R.T	LE	
	192	soLEPUS	1	FEM?	SF	?	?	H.BW	-	
3B	5	soMELEAGRIS	*4	EGSHL	-	-	-	-	SE	
	55	soMELEAGRIS	*3	EGSHL	—	—	-	-	SE	
	60	soMELEAGRIS	1	EGSHL	-	-	-	-	-	
	65	soLEPUS	1	?	SF	?	?	CA.G	LE.ER	
3C	-	LEPUS	1	HUM	D	L	F	-	RE.SE	
5B	5	UNID(SHEL?)	1	Possible Columa bead fragment, but fossil or tooth not ruled out				ER.LE		
11C	5	UNID	4)							
	17	UNID	1)	Material similar to AT 5B5; may be sub-fossil or mineralized bone						
	18	UNID	1)							
12B	12	ref0.ARIES	*2	RAD?	SF	?	Y	-	SE	
	16	D ORDII	1	HUM	D+S	L	F	R?	ER.SE	
		SYLV	1	TOTH	PMLF	?	?	-	FR	
		refLEPUS	1	PHIP	P	?	?	CA.W	CR	
		LAG	1	PH2	C	?	?	CA.W	CR	
		soSYLV	5	LB	SF	?	?	CA.G	CR	
		ISM	1	SCAP?	F	?	?	CA.GB	CR	
		ISM	1	RIB	S	?	?	-	FR	
		ISM	7	?	F	?	?	-	RE	
		MINERAL?	10	-	-	-	-	-	-	
	30	soLEPUS	3	SCAP	F	?	?	-	WE.LE	
		soSYLV	1	SCAP	SF	?	?	-	FR	
		LAG	1	PH1	P	?	F	H.G	-	
12B	32	NEOTOMA	1	MAND	SF	L	?	CA.G.BB	-	
		HETEROM?	1	TOTH	IF	?	?	-	-	
		M.RODENT	1	MAND	PF	?	?	-	-	
		M.RODENT	1	TIB	SF	?	?	H.B	-	
		I.RODENT	1	TIB	F	?	?	-	-	
		LEPUS	1	CALC	C?	L	F	H.GW.PB	-	

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
		LEPUS	1	PH2P	C	L	F	H.W	-	
		LEPUS	1	MT	S	?	?	H.G	-	
12B	32	SYLV	2	TOTH	PM	?	?	R?	-	
		SYLV	1	SCAP	D	L	?	H.G.	-	
		SYLV	1	TIB	D	L	F	-	LE.ER	
		LAG	1	PH1	C	?	F	-	ER	
	33	INDET	?	-	-	-	-	CA.GW	BM	
	38	SYLV	1	MC3	P+S	L	L	-	FR.RE	
		soSYLV	1	LB	SF	?	?	-	FR.RE	
	39	soLEPUS	2	RAD?	SF	?	?	CA.W	-	
		SYLV	5	TIB	SF	?	?	-	FR?	
		ISM	2	LB	SF	?	?	CA.G	-	
	40	soLEPUS	1	FEM?	SF	?	?	-	FR.GP	
	41	NEOTOMA	1	CALC	NC	R	?	CA.W	-	
15C	7	IMM	1	?	F	?	?	CA.G	WE.ER	
	8	refLAG	2	TIB?	SF	?	?	CA.W	RE	
		INDET	2	?	F	?	?	CA.G	LE.ER	
	10	SYLV	1	PALA	F	?	?	CA.Br	CR.LE	
		SYLV	7	TOTH	F	?	?	CA.Br	CR.LE	
		SYLV	1	MTI	P	L	?	CA.Br	CR.LE	
		soSYLV	6	CANC	F	?	?	CA.Br	CR.LE	
		soSYLV	1	PLAT	F	?	?	CA.Br	CR.LE	
		soSYLV	1	LB	SF	?	?	CA.Br	CR.LE	
		refSYLV	1	RAD	P	L	?	CA.Br	CR.LE	
	11	LEPUS	1	MT4	PF	L	?	CA.B	CR	
		LAG	1	BULL	F	?	?	-	—	
	11	soLAG	5	LB	SF	?	?	HB	-	
		refTHOMO	2	ULNA	PF	R	?	-	m.WE	
		refTHOMA	1	RAD	P	R	U	-	m.WE	
		refTHOMO	1	RAD	D	R	U		m.WE	
		ISM	6	LB	SF	?	?	-	m.WE	
		ISM	6	LB	SF	?	?	-	WE	
		ILM(ARTIO?)	1	MAND?	SF	?	?	-	WE	
	12	SYLV	1	HUM	D	L	F?	R?	v.ER	
		ISM	3	LB	SF	?	?	R	ER.LE	
		ISM	1	?	F	?	?	R?B	ER.LE	
	15	IMM	1	CANC	F	?	?	CH.GB	-	
	19-1	IM/LM	1	?	F	?	?	H.GB	-	
	19-2	soSYLV	1	INNO?	F	?	?	H.GW	-	
		soSYLV	3	FEM?	SF	?	?	-	LE.ER	
	20-1	LEPUS	1	CALC	P	R	L	H.G.PB	-	
		LEPUS	1	RIB	PF	?	?	CA.R	LE.WE	
		SYLV	1	ISCH	DF	L	?	CA.R	CR	
		SYLV	1	TIB	DF	R	F	CA.R	CR	
		LAG?	7	LB	SF	?	?	CA.GB	-	
		LAG?	5	LB	SF	?	?	R?	LE.ER	
		ILM	1	LB	SF	?	?	-	LE.ER	
		ILM	3	LB	SF	?	?	CA.GB	LE	
	20-2	ILM	1	LB?	F	?	?	CA.B	-	
		ILM	1	LB	SF	?	?	R?	SE	
	21	LEPUS	1	PHIP	D+S	?	?	H.B	-	
		LEPUS	1	PHIP	DS	?	F	H.B	-	
		SYLV	1	RAD	P	L	?	-	LE.RE	
		SYLV	1	MT3	P+S	?	?	R	-	
		LAG	1	ISCH	F	L	Y	-	RE	

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
		LAG	1	TOTH	I1L	?	Y	R	—	
		LAG	1	RIB	PF	?	Y	R	-	
		soLAG	7	LB	SF	?	?	H.B	-	
		soLAG	1	LB	SF	?	?	R	-	
		soLAG	15	LB	SF	?	?	R?	ER.GP	
		ODOCorO.CAN	1	HUM	DF	R	?	R/CA.G	CR.LE	
		ILM	9	?	F	?	?	R/CA.G	CR.LE	
		ILM	1	RIB?	DSF	?	?	-	ER.LE	
	22-B	LEPUS	1	INNO	SF	L	L	R?	RE	
	22-1	LEPUS	1	PRMX	F	L	U	R?	LE	
		LEPUS	1	TIB	SF	L	?	-	ER.RE	
		SYLV	1	PHIP3	C	R	F	-	LE.RE	
		refSYLV	1	RIB	SF	?	?	-	RE.LE	
		ISM	1	LB	SF	?	?	HW	—	
		ISM	3	LB	SF	?	?	B.H	-	
		ISM	8	LB	SF	?	?	-	RE.GP	
		ILM(ODOC?)	1	MT?	SF	?	?	HG	-	
	22-2	SYLV	1	MT2	P	L	?	-	FR?	
		SYLV	1	SCAP	D	L	?	-	RE.ER	
		soSYLV	6	TIB?	SF	?	?	-	RE.ER	
	23	LEPUS?	1	RAD?	SF	?	?	V.G	-	
		SYLV	1	MAND	PF	L	?	-	RE	
		ISM	4	LB	SF	?	?	-	LE.RE	
		ISM	1	LB	SF	?	?	CA.Br	-	
		ILM	1	LB	SF	?	?	CA.BBr	-	
	24	LEPUS	1	SCAP	DF	?	?	H.B	-	
		LEPUS	1	MT4	C	L	F	-	RE	
		SYLV	1	TOTH	PMF	?	?	R	-	
		SYLV	1	ULNA	PS	L	?	-	RE	
		SYLV	1	FIBI	P	?	?	-	RE	
		SYLV	1	CALC	P+S	R	L	-	RE	
		SYLV	1	MT2	P	L	?	H.B	-	
		LAG	1	PH1	D	?	?	R	—	
		soSYLV	*3	RIB	SF	?	?	-	CR	
		soSYLV	1	FEM?	SF	?	?	-	RE	
		refLAG	4	LB	SF	?	?	H.B	-	
		refLAG	1	LB	SF	?	?	H.B	-	
	25	LEPUS	*3	ILIU	DF	R	?	H.B.BB	-	
		soSYLV	3	LB	SF	?	?	-	FR	
		ARTIO	*3	FEM	SF	?	?	R	-	
	26	SYLV	1	MT2	P+S	L	?	-	RE	
	27	refNeoTOMA	4	TIB	SF	?	?	CA.G	LE	
		soSYLV	1	LB	SF	?	?	CA.GB	-	
	29	soLAG	1	RAD?	SF	?	?	CA.GW	-	
	30	soSYLV	*3	?	F	?	?	CA.G	-	
	32	NEOTOMA	1	TOTH	M1U	?	?	-	ER	
		LEPUS	1	TOTH	T1U	R	?	-	ER.GP	
		LEPUS	1	TOTH	PM1L	?	?	-	ER	
		LEPUS	1	MT2	P+S	L	?	—	ER.GP	
		LEPUS	1	MT1	C	R	F	CH.B	-	
		NEOTOMA	1	FEM	PF	L	F	-	ER	
		SYLV	1	SCAP	SF	?	?	-	GP?	
		SYLV	1	MT3	P	L	?	-	v.ER	
	32	soSYLV	1	MT	PF	?	?	-	v.ER	
		LAG	1	MAND	PF	?	?	-	ER	

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
		ISM	23	LB	SF	?	?	CA.GB	-	
		ISM	2	LB	SF	?	?	R	ER	
		ISM	53	?	F	?	?	-	v.ER	
	33	NEOTOMA	1	TOTH	I1L	R	?	-	v.ER	
		NEOTOMA	1	MAND	SF	R	?	-	m.RE	
		LEPUS	1	RAD	SF	?	?	H.GW	-	
		SYLV	1	TOTH	ML	?	?	-	LE.ER	
		SYLV	1	HUM	D	L	?	-	LE.ER	
		ISM	3	LB	SF	?	?	H.V	-	
		ISM	4	SCAP?	F?	?	-		m.RE	
	34	SYLV	1	FRON	F	L	Y(2mo)	-	m.RE	
		SYLV	1	TIB	SF	R	?	-	m.RE	
		SYLV?	1	FRON?	F	?	?	-	m.RE	
		ISM	1	LB	SF	?	?	H.B	-	
		ISM	1	LB	SF	?	?	H.WB1	-	
	35	LAG	1	FEM	SF	?	?	-	RE	
	36	LEPUS	•6	HUM	C?	R	F?	-	v.ER	
		LEPUS	2	TIB	SF	?	?	-	RE	
		LEPUS	1	PH1P	C	?	?	CH.B	-	
		LEPUS	1	PH2P	C	?	?	R?	LE	
		SYLV	1	MAND	PF	R	?	-	LE	
		SYLV	1	HUM	C?	R	F?	-	v.ER	
		SYLV	1	HUM	DS	R	?	-	v.ER	
		SYLV	1	RIB	PF	?	?	-	LE	
		SYLV	1	RAD	F	?	?	H.B	-	
		SYLV	1	MT3	P+S	L	?	-	ER	
	36	soSYLV	3	MT	SF	?	?	-	ER	
		LAG	1	BULL	F	?	?	-	-	
		soSYLV	13	LB	SF	?	?	R?	ER	
		soSYLV	14	LB	SF	?	?	V.GB	-	
		IARTIO	1	TOTH	PMF	?	?	-	m.ER	
		ILM	1	?	F	?	?	R/V.FB	-	
	37	LEPUS	•3	FEM	S	?	?	-	ER.RE	
		SYLV	1	FEM	S	?	?	-	ER.RE	
		LAG	1	FIBI	P	?	U	-	ER.RE	
		ISM	6	SKUL?	F	?	?	-	ER.RE	
		ISM	5	LB	SF	?	?	-	ER.RE	
		ISM	2	LB	SF	?	?	V.GB	-	
	40	ISM	•4	LB	SF	?	?	CA.W	LE	
	41	ISM	1	LB	SF	?	?	-	RE.LE	
	42	soSYLV	6	LB	SF	?	?	-	CR.LE	
		soLAG	1	LB	SF	?	?	H.B	-	
		ISM	1	SKUL?	F	?	?	H.B.	-	
	44	SYLV	1	RAD	SF	?	?	H.B	-	
		ISM	9	LB	SF	?	?	-	LE.RE	
		ISM	2	LB	SF	?	?	V.B	-	
		ILM	1	LB	SF	?	?	-	LE.RE	
		ILM	1	SCAP?	F	?	?	-	LE.RE	
		ILM	1	CANC	F	?	?	-	LE.RE	
	45	S/M.Sciurid	1	ULNA	P+S	L	?	-	FR.RE	
		LEPUS	1	TOTH	M	R	?	-	v.ER	4
		LEPUS	1	ILIU	SF	L	?	-	v.ER	4
		LEPUS	1	ISCH	NC	R	?	-	v.ER	4
		SYLV	1	TOTH	PML	L	?	-	v.ER	4
		SYLV	1	RAD	P	R	?	-	v.ER	4

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
		SYLV	1	RAD	SF	?	?	-	v.ER	4
		SYLV	1	ULNA	SF	?	?	R?	RE	
ISM	13	LB		SF	?	?	-	v.	ER	4
	46	SYLV	1	MAND	SF	?	?	-	ER	
		SYLV	1	MAND	DF	?	?	-	ER	
		SYLV	1	CALC	C	R	L	-	ER	
		LAG	1	PH1	C	?	F	-	-	
		soSYLV	1	RIB	F	?	?	-	ER	
		soLAG	6	?	F	?	?	V.GB	—	
		soLAG	13	?	F	?	?	-	v.ER	4
	47	SYLV	1	MC2	C	L	F	-	ER.RE	
		SYLV	1	MC3	C	L	F	-	ER.RE	
		SYLV	1	MC4	C	L	F	-	ER.RE	
		LAG	1	PH1	SF	?	?	-	ER.RE	
		ISM	3	LB	SF	?	?	-	ER.RE	
		ISM	3	LB	SF	?	?	-	FR	
	48	M.RODENT	1	INNO	F	?	?	-	FR	
		LEPUS	1	TIB	SF	?	?	-	LE.RE	
		LEPUS	1	ULNA	SF	R	?	-	LE.RE	
		LEPUS	1	RIB	SF	?	?	-	LE.RE	
		LEPUS	1	TIB	SF	L	?	H.GB1	-	
		LAG	1	PH1	D+S	?	?	-	LE.RE	
		ISM	14	LB	SF	?	?	-	LE.RE	
		ISM	2	LB	SF	?	?	-	v.RE	4
		ISM	2	?	F	?	?	V.G	-	
		ISM	1	LB	SF	?	?	-	FR	
15C	49	LEPUS	1	TIB	SF	L	?	-	m.ER	
		soLEPUS	1	SCAP	SF	?	?	CA.G	-	
		SYLV	1	ZYGO	NC	L	?	-	m.ER	
		SYLV	2	MAND	F	?	?	-	v.ER	
		SYLV	1	RIB	PF	?	?	-	m.ER	
		SYLV	1	ULNA	P+S	L	J	-	v.ER	
		SYLV	1	ULNA	S	L	Y	-	v.ER	
		SYLV	1	MC	S	?	U	-	m.ER	
		SYLV	1	TIB	D+S	R	F	-	v.ER	
		SYLV	1	PH1M	C	?	F	-	m.ER	
		LAG	1	ULNA	S	L	?	-	v.ER	
		soLAG	4	?	F	?	?	-	m.ER	
		soLAG	4	?	F	?	?	-	v.ER	
	50	LEPUS	1	MT	D	?	?	H.B	-	
		LEPUS	1	ULNA	P	L	?	-	v.ER	
		LEPUS	1	PH1P	S	?	?	R	-	
		SYLV	1	MT1	P	R	?	?	v.ER	
		ISM	1	?	F	?	?	R	-	
		ISM?	2	CANC	F	?	?	—	-	
	53	SYLV	1	HUM	C	L	F	-	SE.RE	
18C	1	INID(SHEL)	6	?	F	-	?	-	PT	
		INID(SHEL)	1	?	F	-	?	-	AP.PT	
	23	ISM	1	?	F	?	?	-	ER	
	24	HERP(COLUB?)	1	VER	NC	-	?	R?	m.RE	
		LEPUS	1	VERL7	NAF	-	?	R?	m.RE	
		refLEPUS	1	VERL	LP	-	?	R?	m.RE	
		ISM	20	?	F	?	?	R?	FR	4
		ISM	1	LB	SF	?	?	H.W	-	
21C	24	BOS/BISON	1	TIB	SF	L	L	-	SE.RL	5

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
23C	1	LEPUS	*2	NAVI		C	R	L	H.B	-
		SYLV	1	RAD	SF	?	?	H.G	-	
		ODOC/OC	*2	HUM	D	L	YA/A.S	FB.GBr	-	
		ODOC/OC?	*5	HUM?	SF	?	?	FB.GBr	-	
		refO.ARIES	*6	VERC	C	-	F	FHB.W	-	
		refO.ARIES	1	PH.M2	P+S	?	F	FBH.GB	-	
		ref0.ARIES	1	PH.M2	PF	?	F?	FBH.W	-	
		refO.ARIES	1	PHM1	PF	?	F?	FBH.W	-	
		refO.ARIES	1	PHM1	PF	?	F?	FBH.GB	-	
		refO.ARIES	1	PHL1	PF	?	?	FBV	-	
		ARTIO	2	TOTH	F	?	?	R?	-	
		ARTIO	1	RIB	PSF	?	?	R.T	-	
		ILM	4	LB	SF	?	?	H.B	-	
		ILM	7	CANC	?	?	?	V.WG	-	
31C	230	OLIVELLA	1	SHEL	C	-	-	-	PT.SE	6
	236	OLIVELLA	1	SHEL	NC	-	-	-	PT.SE	6
	273	OLIVA	1	SHEL	F	-	-	-	PT	7
	375	LEPUS	1	SCAP	NC	R	L	-	FR	
	374v			plus a locally common fossil shell						
	376	LEPUS	1	MAX	F	R	-	R	-	
		LEPUS	1	MAND	DF	L	?	R	-	
		LEPUS	1	VERL	NPF	-	?	R	-	
		LEPUS	2	RIB	PF	?	?	R?	RE	
		LEPUS	1	RIB	SF	?	?	R?	FR	
		LEPUS	1	SCAP	D	R	L	R?	LE.RE	
		LEPUS	1	HUM	D	R	L	-	LE.RE	
31C	376	LEPUS	1	ULNA	PF	L	F	H.B	-	
		LEPUS	1	TIB	S	R	?	-	m.RE	
		LEPUS	1	TIB	S	R	?	-	-	
		LEPUS	1	FIBI	S	?	?	-	m.RE	
		LEPUS	1	TAL	C	R	M	-	RE.LE	
		LEPUS	1	CALC	NC	L	M	-	RE.LE	
		LEPUS	1	CALC	PF	?	?	-	-	
		LEPUS	1	MT2	D+S	L	F.L	-	FR	
		LEPUS	1	TARS	C	L	—	-	-	
		LEPUS	1	PH1P	D+S	?	-	R?	RE	
		LEPUS	1	PH2P	C	?	F	R?	FR	
		LEPUS	1	PH3P	C	?	F	-	FR	
		LEPUS	1	PH3P	C	?	F	-	FR	
		SYLV	1	TEMP	C	R	Y	R	-	
		SYLV	1	RIB	C	L	F	-	-	
		SYLV	1	VERT	NC	-	U	-	RE	
		SYLV	1	SCAP	D	R	L	-	RE	
		SYLV	1	MC3	P+S	L	?	H.GW	-	
		SYLV	1	PH1M	C	?	F	H.GW	-	
		SYLV	1	TIB	SF	L	-	-	m.RE	
		SYLV	1	CALC	NC	L	M	-	LE.RE	
		LAG	1	BULL	F	?	?	-	m.RE	
		LAG	1	TOTH	IF	?	?	R	-	
		LAG	1	SCAP	SF	?	?	-	WE	
		LAG	1	TIB	SF	?	?	-	m.RE	
		LAG	1	TIB	SF	L	?	-	m.RE	
		LAG	1	MP	D	?	F	-	FR	
		NEOTOMA	1	MAND	SF	R	L	R?	-	

Site	FS	Taxon	No.	Element	Port	Lat.	Age/Size Sex Fus.	Burning	Condition	Notes
		refNEOTOMA	1	OCCI	F	-	?	-	FR	
		ISM	96	LB	SF	?	?	-	WE.RE	
		ISM	10	SCAP?	F	?	?	-	WE.RE	
		ISM	2	?	F	?	?	V.B	-	
		ISM	4	LB	SF	?	?	H.W	-	
36C	9	INDET	1	?	F	?	?	-	v.SE	
		LEPUS	1	RAD	P	R	L?	H.W	-	
		LEPUS	1	MT4?	P	?	L?	H.W	-	
		LAG	1	PH3	C	?	?	CA.G	-	
		soLAG	1	VER	F	?	?	CA.G	-	
		soLAG	28	LB	SF	?	?	H.V	-	
		soLAG	1	LB	SF	?	?	R?	CR.ER	
	39	ISM	2	?	F	?	?	W	-	
	40	soSYLV	1	?	F	?	?	V	-	
	41	ISM	3	CANC	F	?	?	-	v.CR	
	43	soLAG	4	?	F	?	?	CA.G	-	
		soLAG	1	?	F	?	?	H.W	-	
37C	72	SYLV	1	TOTH	PM	?	?	R?	LE	
38C	13	ILM	3	CANC	F	?	?	H.W	-	
	17B	ILM(ARTIO)	2	MP?	F	?	?	H.W	-	
		soLAG	1	LB	SF	?	?	H.W	-	
	17S	HALIOTUS	2	SHEL	F	?	?	-	AP	

Appendix 11-1 • Lithic Analysis Codes (POST 8/25/82)

Column 1 Site or Isolated Find

0 - site
5 - isolated find

Column 2-4 Site Number or Isolated Find Number

Column 5 Crew Designation

1 - crew A	2 - crew B	3 - crew C
4 - crew H	5 - crew M	6 - crew W

Column 6 Subsite Designation

1 - locus a	2 - locus b	3 - locus c
4 - locus d	5 - locus e	6 - loci a-c
7 - locus f	8 - locus g	9 - locus j

Column 7-9 Artifact Specimen Number

Only label classes of artifacts for special analysis
1-n

Column 10-11 Artifact Type

01 - flake	02 - retouched flake
03 - sm. angular debris	04 - lg. angular debris
05 - projectile point	06 - biface
07 - uniface	08 - unmodified
09 - preform	10 - core
11 - burin (chisel)	12 - perforator
13 - drill	14 - uniface/hammerstone
15 - hammerstone	16 - chopper
17 - scraper	18 - hammerstone/chopper
19 - hmer/ground stone	20 - mano
21 - undeterm grndstone	22 - grooved maul
23 - axe	24 - side notched tool
25 - handed hoe, unhafted	26 - tested core
27 - exhausted core	28 - core/chopper
29 - core/hammerstone	30 - bipolar flake
31 - retouched S.A.D.	32 - retouched rock
33 - metate fragment	34 - metate
35 - denticulate	36 - fire spall
37 - anvil stone	38 - core/tool
39 - core/ground stone	40 - flake of hmerstone/ core
41 - wedge	42 - axe/maul
43 - flake fm ground stone	44 - other

Column 12 Artifact Breakage

1 - whole	2 - fragmentary	3 - unknown

Column 13-16 Material Type

four digit lithic code

Column 17-20 Weight in Grams

0000 - less than 1 gram
9999 - greater than or = 9999 grams

Column 21-23 Length in millimeters

Column 24-26 Width in millimeters

Column 27-29 Thickness in millimeters

Column 30-31 Cortex

0 - no cortex
1 - 1 to 25%
2 - 26 to 50%
3 - 51 to 75%
4 - 76 to 99%
5 - 100%

*Dorsal Cortex only for flak
Other classes of artifacts
monitor % of cortex on the
entire cortex

Column 33 Utilization and Retouch

0 - none
1 - utilized
5 - unidirectional retouch
6 - bidirectional retouch

A "0" in column 33 m
the flake or piece of s
angular debris is not
utilized.

Column 34-35 Edge Angle

(to the nearest 5 degrees)

Column 36 Edge Shape

0 - other	1 - concave	2 - convex
3 - straight	4 - notches	5 - projection
6 - concave/convex	7 - denticulate	

Column 37-38 Wear Patterns

00 - none	
01 - nibble	02 - nibble and feather
03 - nibble and step	04 - nibble and crescen
05 - nibble and abrasion	06 - nibble, feather and
07 - nibble, feather, and crescentic	
08 - nibble, feather, and abrasion	
09 - nibble and step	10 - feather
11 - feather and step	
12 - feather, step and crescentic	
13 - feather, step and abrasion	
14 - feather and abrasion	15 - step
16 - step and abrasion	17 - step and battered
18 - polished, pecked, and striated	
19 - polished, abraded, and striated	
20 - crescentic	21 - crescentic and feat
22 - polish and pecked	23 - polish and battered
24 - polish	25 - abrasion
26 - step, pecked, and striated	
27 - abraded, pecked, and striated	
28 - polished and striated	
29 - polished, battered, and striated	
30 - possible utilization	31 - possible retouch

32 - battering
33 - pecked
34 - abraded and pecked
35 - striated
36 - battered and striated
37 - pecked and battered
38 - pecked, battered and abraded
39 - nibble and striated
40 - nibble, feather step and crescentic
41 - nibble, feather step and abraded
42 - nibble, feather step, abraded and crescentic
43 - nibble, feather, abraded, and crescentic
44 - shaped and abraded
45 - 49 not used
50 - nibble, feather, step, crescentic and abraded

Use these codes for wear on flakes and small angular debris only!

51 - unidirectional scars
52 - bidirectional scars
53 - unidirectional rounding
54 - bidirection rounding
55 - unidirectional scars and rounding
56 - bidirectional scars and rounding

Column 39-44 Right Lateral Edge

(same procedure as 36-38)

Column 45-50 Proximal Edge

(Only record non-platform wear and wear that occured after the flake was removed from the core.)

Column 51-56 Distal Edge

(Same as 36-38)

Column 57-58 Non-flake Edge Wear

(Use wear codes in column 37-38)

Column 59 Platform Type

0 - absent
1 - cortex
2 - collapsed
3 - facet (simple)
4 - retouched
5 - ground preparation
6 - stepped
7 - indeterminate

Column 60-62 Platform/Dorsal Angle

(Measured in degrees to the nearest 5 degrees)

Column 63 Angular Debris

Subjective judgement as to whether the artifact is shatter or not. Only record for small and large angular debris.

Column 64-71 Blank

Column 72 Phase of Project

1 - survey
2 - testing
3 - excavation

Column 73-74 Site Location

PL - Placitas FM - Farmington LC - Las Cruces

Column 75-76 Feature Number

Column 77-80 Field Specimen Number

Lithic Analysis Comment Codes

01 Heated
- 01 - red/heat treat
- 02 - crazed
- 03 - pot lids/fire spalls
- 04 - crazed + red
- 05 - red + pot lids
- 06 - crazed + pot lids
- 07 - all

02 Notching Flake
03 Biface Sharpening Flake
- 01 - possible proximal use

04 Outre-Passe Flake/Biface Thinning Flake
05 Platform Rejuvenation Flake/Core Rejuvenation
06 Double Platform or Bulb/Bulb Thinning Flake (2 lines of code)
07 Conjoinable Pieces (Matching PC# 2 Digits)
08 Pieces From Same Core (Not Conjoinable) (Matching Pc# 2 Digits)
09 Ventral Cortex
10 Cortical Platform
11 Possible Flake
12 Possible Bipolar Flake
13 Possible Angular
14 Possible Use
15 Dorsal Use (Follow with edge angle, 9, edge shape, wear pattern)
16 Scraper Use
17 Blood Residue/Pulled for Blood Analysis
18 Residues
19 Leached
20 Composite Tool/Multiple Tools/Use
21 Blank
22 Point Fragment
- 00 - all but base
- 01 - tip
- 02 - ear
- 03 - base
- 04 - tip + edge
- 05 - edge + ear
- 06 - ear + base
- 07 - midsection
- 08 - longitudinal section
- 09 - all but tip

23 Bipolar Core/Piece Esquillee
24 Pulled for Material Type Collection/TC/Type Collection
25 Question Material Type (PC# 2 Digits)
26 Pulled (PC# 2 Digits)
27 Not Numbered
28 Possibly Heated
29 Possibly Unmodified
30 Possible Fire Spall
31 Possible Retouch

32 ? (Any Field)
33 Possible Scraper
34 Spokeshave
35 Multifacet Core
36 Single Facet Core
37 FCR
38 Utilized Platform
39 Ground
40 Stepped
41 Flake from Uniface
42 Dorsal Battering
43 Biface Core
44 Possible Hafting
45 Core Flake
46 To Be Reanalyzed with Ground Stone
47 Pulled for Morphology Type
48 Bipolar Debris
49 Ventral Use (on surface) Treat as Code 15
50 Pecking Stone
51 Possible Shaping
52 Jewelry or Specialty Item

Comment 3932 14 — Implies Biface Sharpening
Codes 14 and 31 Follow W/

01 - Left Lateral   02 - Right Lateral
03 - Prox.   04 - Dist.
05 - Dorsal

The comment field will be used as two four-digit field Each field will have a two-digit comment code and a tw digit description code. The description codes are pare thesized on this list. The "PC# Digits" description co refers to the row designation (1-24 on the left margin) c the Lithic Coding Sheet.

Code 15 — leading "9" in second comment field is dummy number to avoid confusion between use codi and other comments. Effectively all codes in Field 2 (co umn 68-71) > = 90, < 99 are use codes.

Appendix 11-2 • Lithic Identification Codes[1]

Helene Warren

Chalcedonic and Related Rocks
1000-1019
Lithic Code-1

1010 Chert, fossiliferous, undifferentiated
1011 Chert, fossiliferous, cream to light red; cobbles in Ojo Alamo SS; Rio Grande, San Juan, and Rio Puerco Terrace Gravel; yellow brown cortex; fossils are minute circular inclusions (includes 1012)
1012 Chert, as above, but usually with fewer obvious fossil inclusions. Rio Grande gravel
1013 Chert, fossiliferous, with crinoid stems, cream colored. Cook's Peak; from limestone
1014 Chert, chalcedonic: May be banded; varicolored; unidentified, fossils include needle-like, seed-like shapes, Southern San Juan Basin from high surface (late Tertiary)
1015 Chert, fossiliferous, nearly black with tiny rod-like white fossils; Sandia Fm; near La Madera, N.M.
1016 Chert, fossiliferous; San Andres Formation, Zuni Mountains, Sacramento Mountains, etc., gray, tan banded
1017 Chert, fossiliferous; resembles 1016; usually pebble cortex; no banding; in Ojo Almo?, Mancos shale? San Juan Basin
1018 Edward's chert, light blue gray

Chalcedonic and Related Rocks
1020
Lithic Code-2

1020 Chert, clastic, containing scattered quartz grains; often grades to chert or sedimentary quartzite; undifferentiated
1021 Chert, clastic, tan, original cortex dull red; grades to sedimentary quartzite (2202); Nacimiento Fm., San Juan Basin
1022 Chert, clastic; creamy white; grades to light green; upper Morrison: San Juan Basin (grades to 1040 and 2205)
1030 Chert, black, undifferentiated
1031 Chert, black, chalcedonic, waxy luster, translucent on thin edges
1035 Chert, black, banded; dull luster. Probably from Mancos Shale
1040 Chert, green, cream, etc., glossy luster to dull; Brushy Basin Mb., San Juan Basin (see 2552)
1041 Chert, mottled pink, as 1040; Lukachuki, Ariz.; San Juan Basin Fm., San Juan, Co.
1042 Chert, red, gray, purplish; glossy luster; argillaceous; associated with baked shales of the San Juan Basin (2551)
1044 Chert, green, undifferentiated; resembles 1040
1045 Chalcedony, green, uniformly colored
1046 Chert, green, undifferentiated

Chalcedonic and Related Rocks
1050-1069
Lithic Code-3

1050 Chert, white, misc.
1051 Chert, white with black mossy inclusions, misc.
1052 Chalcedony, clear, misc.
1053 Chalcedony, clear with black mossy inclusions, misc.
1054 Chalcedony, includes 1050-1053, 12, 14, 1215, 1098, 1099; high surface gravel, Sante Fe, Fm.
1056
1057
1060 Chert, dark red, (jasper) misc.
1061 Chert, dark red, with hematite (Vallecitos Cg)
1062 Chert, dark red, from Datil Fm.
1063 Chert, dark red, with crimson inclusions, Tecolote Chert in part (see 1602)

Chalcedonic and Related Rocks
1070-1099
Lithic Code-4

1070 Chert, yellow brown, brown (jasper), misc.
1071 Chert, yellow brown, oolitic (see 1550)
1072 Chert, yellow brown, with black mossy inclu sions (chert), grades to red
1073 Chert, yellow brown, with olive brown chalce dony inclusions, Cochiti, Zia areas.
1074 Chert, Light yellow brown (10 yr 6/2) Chalce donic and white inclusions - Plains Source
1075 Chert, dark brown, misc.
1080 Chalcedony and opal, pink to pinkish orange, Washington Pass Chert
1081 Chalcedony and opal, pink (ressembles 1080)
1090 Chert, pedernal
1091 Chert, pedernal, chalcedonic
1092 Chert, Zuni, white with scattered to red-yellow inclusion (Bidahochi)
1093
1098 Chert, Chalcedonic similar to 1091
1099 Chert, ressembles 1090

[1] *After Warren (1979b).*

Chalcedonic and Related Rocks
1200-1299
Lithic Code-6

1200 Chalcedonic, with inclusions, misc. white
1201 Chalcedonic, with inclusions, white and red
1210 Chalcedony, mossy inclusions, misc.
1211 (97A) Chalcedony, with green inclusions (Cochiti Area) red, metallic
1212 (97C) Chalcedony, abundant red and yellow inclusions (moss jasper) Cochiti
1213 Chalcedony, banded, white,yellow brown with or without black mossy inclusions; Cochiti Area
1214 Chalcedony, clear colorless with milky white inclusions; also pink or flesh colors. Zia-Jemez
1215 Chalcedony, clear and white and black inclusions (Jemez) Chaco Canyon
1220 Chalcedony, clear colorless with scattered yellow mossy inclusions misc.
1221 Chalcedony, clear abundant yellow mossy inclusions (moss jasper) misc.
1230 Chalcedony, clear with sparse red inclusions, misc.
1231 Chalcedony, clear with abundant red inclusions
(moss jasper) misc.
1232 Chalcedony clear with scattered yellow and red inclusions, misc.
0233 Chalcedony, clear with abundant yellow and red inclusions (moss jasper)
1234 Chalcedony, clear with red inclusions and black
1235 Chalcedony, clear with red-purplish inclusions (moss jasper)
1240 Chalcedony, Clear with brown-purplish inclusions
1250 Chalcedony, (banded), misc.
1251 Chalcedony, colorless, white, yellowish banded, Apache Creek area to black, red, green
1285 Chalcedony, crimson, colorless banded, in upper Morrison, Canada Del Ojo (see 1440)

Chalcedonic and Related Rocks
1300-1399
Lithic Code-7

1300 Chalcedony, misc. clear, colored uniformly
1310 Chalcedony, clear, uniform shades of yellow, misc.
1315 Chalcedony, clear, uniform shades of orange.
1320 Chalcedony, clear uniform shades of pink or red, misc.
1330 Chalcedony, clear uniform shades of light gray.
1340 Chalcedony, clear uniform shades of light brown
1345 Chalcedony, clear uniform shades of dark brown
1390 Opal, white
1391 Opal, blue hyalite, Cochiti area (La 10554, Canada de Cochiti)

Chalcedonic and Related Rocks
1400-1499
Lithic Code-8

1400 Chert, undifferentiated (103)
1410 Chert, resembles Alibates quarry (Texas, N.M
1411 Chert, resembles Alibates, Yeso, N.M. (98A)
1412 Chert, banded as Alibates
1415 Chert, light red to gray
1420 Chert, gray banded, Dona Ana Canyon (990) (This may be San Andres?)
1421 Chert, red fossiliferous, Ana Canyon (99A)
1422 Chert, mottled, red buff, Ana Canyon (99B) (Fusselman Fm)
1423 Chert, banded, red, gray or buff, "Candy Rock or "Wonder Stone; (jasperoid Lake Valley)
1425 Chert, mottled, 2 or more colors, misc.
1429 Chert, Morrison and jasper
1430 Chert and chalcedony, Laguna N.M.
1431 Chert and chalcedony, Waldo, N.M., mottled red and gray (97C)
1432 Chert, Baldy Hill, Union Co.; Orange-red mossy jasper (see 1602), Morrison Fm.
1433 Chert red and gray, undifferentiated
1434 Chert, Morrison (upper) includes 1430, 1431 1432
1435 Chert, red and cream to orange and red, wax (see 1602 Tecolote chart) (see 1073) (see lowe Rio Puerro)
1436 Chert, subsumes 1430, 1431, 1432, generic
1440 Novaculate
1450 Chert, Flint Ridge, Ohio

Chalcedonic and Related Rocks
1500-1599
Lithic Code-9

1500 Chert, jasperoids, and porcellanites, volcanic associations
1501 Chert, cream, buff, red, Jemez Mountains, in rhyolite tuffs (Gray/xls) (97C)
1502 Chert, gray, banded, clastic feldspar, etc., altered rhyolite, dull, in river gravel; Common i Ojo Caliente vicinity (see 4721)
1520 Chert, clayey or pelitic origin.
1550 Chert, oolitic (see 1071)
1551 Chert, oolitic, dark brown Rio Puerco; high sur face, San Juan Basin, Ortiz gravel

1570 Chert, breccia
1571 Chert, breccia, cream, light gray, pinkish, Chama area

Cherts and Related Rocks
1600-1999
Lithic Code-10

1600 Light gray chert, misc.
1601 Light gray chert, to reddish gray, Nambe area
1602 Light gray chert, to reddish gray and dark gray, may be fossiliferous (Tecolote chert see 1501)
1610 Chert, dark gray, misc.
1611 Chert, dark gray, La Madera Formation, Sandia Mountains
1615 Chert, dark gray with red inclusions, misc.
1620 Chert, light yellow
1630 Chert, cream colored
1635 Chert, cream colored to white and red tints
1640 Chert, light orange
1650 Chert, Olive, Olive green, olive gray, misc.
1651 Chert, olive gray, ranges to red and brown with quartz (Nambe area)
1660 Chert, light tan or buff
1661 Chert, pebbles mottled light brown, Zuni area
1662 Chert, pebbles well polished, grainy, Upper Morrison, Canada del Ojo; mottled in yellow or varicolored.
1680 Chert, pinkish, misc.

Sedimentary Rocks
2000-2099
Code 10

2000 Sandstone, undifferentiated
2005 Sand, unconsolidated (dune sand, channel sand, etc.)
2010 Sandstone, fine grained, indurated, massive, undifferentiated
2011 Sandstone, fine grained, indurated, massive, fritter (?)
2015 Sandstone, very fine grained (less than 0.125), undifferentiated
2020 Sandstone, fine grained, indurated, slabby, undifferentiated
2021 Sandstone, fine grained micaceous, undifferentiated (0.125-0.25 mm)
2025 Sandstone, coarse grained, micaceous, undifferentiated (0.5-1.0 mm)
2030 Sandstone, fine grained, indurated; cobbles
2040 Sandstone, fine grained, subangular grains, undifferentiated, friable
2041 Sandstone, fine grained, subangular and rounded grains, undifferentiated
2042 Sandstone, fine grained, subangular, with some colored grains, undifferentiated
2043 Sandstone, fine grained, subangular, to rounded, with some colored grains, undiffer entiated
2045 Sandstone, fine grained, slabby, friable, undifferentiated
2050 Sandstone, medium grained (0.25-0.5), clear subangular grains; undifferentiated
2051 Sandstone, medium grained (0.25-0.5), clear subangular grains to rounded; undifferentiated
2052 Sandstone, medium grained (0.25-0.5), clear and colored subangular, undifferentiated
2053 Sandstone, medium grained (0.25-0.5), clear and colored subangular, and rounded, undifferentiated.

Sedimentary Rocks
2000-2099
Lithic Code-11A

2060 Sandstone, medium to coarse grained (0.25-1.0), indurated, slabby, undifferentiated
2061 Sandstone, fine to coarse grained (0.125-1.0+), undifferentiated
2064 Sandstone, fine to coarse grained, friable, calcareous
2065 Sandstone, fine to coarse grained, friable, un differentiated
2070 Sandstone,fine to coarse grained, indurated, cobbles, undifferentiated
2080 Sandstone, coarse grained (0.5-1.0), subangular, clear, undifferentiated
2081 Sandstone, coarse grained (0.5-1.0), subangular to rounded, clear, undifferentiated
2082 Sandstone, coarse grained (0.5-1.0), subangular, clear and colored grains, undifferentiated
2083 Sandstone, coarse grained (0.5-1.0), subangular to rounded, clear and colored, undifferentiated
2090 Sandstone, hematitic, undifferentiated
2091 Sandstone, limonitic, undifferentiated
2092 Sandstone, mangetitic, undifferentiated
2093 Sandstone, manganitic, undifferentiated
2094 Sandstone, calcareous, fine grained, undifferentiated
2095 Sandstone

Sedimentary Rocks
2100-2199
Lithic Code-12

2100 Gallup Sandstone, hematitic
2101 Chuska Sandstone
2102 Cretaceous sandstone, undifferentiated
2103 Sandstone, cobbles, undifferentiated
2104 Nacimiento, feldspathic, massive, Largo Canyon, etc.
2105 Nacimiento, manganitic, hematitic
2106 Nacimiento, gray green, mottled, Largo Canyon
2107 Graywacke, tuffaceous, friable, Cochiti District
2108 Sandstone, fine grained, moderate indurated, slabby, buff and red, Cochiti area
2109 Sandstone, pale yellow (jarosite) grading to clay; Cochiti area
2110 Sandstone and siltstone, white, red, green, grades to tuff, Datil Fm. volcanics
2111 Sandstone, greenish gray, very coarse (Mancos Shale?), Cerrillos
2112 Sandstone Prewitt Mb, Morrison Fm, coarse grained, pink, with chalcedonic cement; Prewitt area.
2113 Sandstone Chinle ss
2114 Sandstone, Abo Fm ss, coarse arkosic, with orange feldspar
2115 Sandstone Ojo Alamo Fm, San Juan Basin
2116 Sandstone, Morrison Fm, undifferentiated
2117 Sandstone, Glorieta Fm
2118 Sandstone, Dakota Sandstone, undifferentiated
2119 Sandstone, Tesuque Fm
2120 Sandstone, Galisteo Fm, undifferentiated
2121 Sandstone, Menefee Fm, undifferentiated
2122 Sandstone, Flagstone (red) Triassic rocks
2123 Sandstone, Cliffhouse ss (Chaco Canyon), friable
2124 Sandstone, Cliffhouse ss (Chaco Canyon), moderate indurated
2125 Sandstone, pictured cliffs, (Chaco Canyon), indurated
2126 Sandstone, Cliffhouse Fm (Chaco Canyon), very hard
2127 Sandstone, San Jose Fm, San Juan Basin
2130 Sandstone, Prewitt Mb, Morrison Group (see 2112), no cement
2131 Sandstone, Brushy Basin Mb, Morrison
2132 Sandstone, lower Morrison
2140 Sandstone, Mesa Verde Group, fine to medium grained, undifferentiated
2141 Sandstone, Fruitland Fm
2142 Sandstone, Kirtland Fm
2143 Sandstone, Point Lookout
2144 Sandstone, Crevasse Canyon
2150 Sandstone, Gallup Sandstone, coarse grain feldspathic
2155 Sandstone, Tohatchi Fm, Menefee Fm
2160 Sandstone, Sangre de Cristo Fm
2161 Sandstone, Pecos Sandstone Temper, micaceous, Arkusa

Sedimentary Rocks
2200-2249
Lithic Code-13

2200 Quartzitic sandstone, misc.
2201 Quartzitic sandstone, Brushy Basin ?, Nava Project, upper Morrison or Purgatory
2202 Quartzitic sandstone, Nacimiento Fm, Larg Canyon (see 1020, 1111)
2203 Quartzitic sandstone, Cochiti area, brown, r red-purple, also Zia area
2204 Quartzitic sandstone, (see 2110) red, dark, Spears member of Datil Fm, and quartzitic s stone
2205 Quartzitic sandstone, NE New Mexico; white buff, orange, to red or Morrison Fm. fine grained, even, conchoidal fracture (see 220
2206 Quartzitic sandstone, Baldy Hill Fm., very fi grained, conchoidal fracture (see 4060, 220
2207 Quarzitic sandstone, fine grain, black, (Morrison)
2220 Quartzitic sandstone, coarse grained, red, hi gravel, Chaco area
2221 Quartzitic sandstone, high surface gravel, S Juan Basin; mottled gray-tan

Sedimentary Rocks
2250-2275
Lithic Code-14

2250 Siltstone, undifferentiated (134, 135, 135A, 36)
2251 Siltstone, mudstone, sandstone, pinkish, vo canic, indurated; Datil Fm sediments
2252 Siltstone, mudstone, sandstone, white, pink thin, slabby
2255 Siltstone, calcareous
2260 Siltstone, white, thin slabby (Morrison Fm ? see 2116 (Zuni area)
2261 Siltstone, dark green, upper Morrison, San Juan Basin
2270 Siltstone, silicified (Quartzitic Siltstone)
2275 Claystone, red, etc., undifferentiated

Sedimentary Rocks
2300-2499
Lithic Code-15

2300 Conglomerate, undifferentiated (173)
2310 Conglomerate, pebble and coarse sand
2350 Breccia, undifferentiated
2400 Arkose, undifferentiated (174)
2450 Graywacke, undifferentiated
2456 Graywacke, medium to coarse, slabby
2470 Volcanic sandstone, undifferentiated (coarse)
2471
2475 Volcanic sandstone, sand, high quartz, round matrix: Jemez Mountains-washes,

Sedimentary Rocks
2500-2699
Lithic Code 16

(Clay, shale, and related rocks)

2500 Clay, undifferentiated
2550 (141A) Claystone, undifferentiated
2551 Claystones, baked clays and shales, San Juan Basin (138, 137, 139) (see 1042), pink, red, and white
2552 (150) Claystone, Brushy Basin Fm (150)
2554 Claystone, burned or fritted clays, White Rock Canyon, red, yellow, green
2560 (1570) Kaolin
2600 Mudstone
2650 (142) Shale, undifferentiated
2651 (144) Shale, lower Mancos Shale, San Juan Co., Maculose
2652 Shale, white, mica, Zuni area (see 2116, 2260)
2555 Claystone, red, pipestone, Prescott, Arizona
2556 Claystone, red, pipestone, Pipestone, Minn.
2560 Claystone, red, pipestone, Pecos, N.M? In S.C. ?

Sedimentary Rocks
2700-2799
Lithic Code-17

2700 (146) Limestone, undifferentiated
2701 (146) Limestone, San Juan Co., Todilto ? Fm
2705 Limestone, slabby
2710 Limestone, fossiliferous
2740 (147) Chalk
2750 Travertine, undifferentiated
2751 (149) Travertine, banded, orange pink, Navajo Project, Mexican onyx
2752 Mexican onyx, Arizona, S. of Flagstaff
2760 Tufa
2765 Travertine, Lucero Mesa, banded
2770 (126B) Caliche
2771 Caliche tubules
2780 Dolomite
2790 Iron oxide rock (hematite rock), in sandstone, LA 70

Sedimentary Rocks
2800-2849
Lithic Code-18

(Evaporites: salines, etc.)

2800 (123B) Rock gypsum
2810 (179) Diatomite White Rock Canyon, etc.
2820 Coal
2821 Jet
2822 Lignite

Sedimentary Rocks
2850-2999
Lithic Code-19

(Fossils and concretions)

2850 Fossils, undifferentiated
2860 (170) Fossils, limestone
2861 (170) Fossils, limestone, gray, Navajo Project
2862 Fossils, limestone, reddish gray, Jemez?
2863 Fossils, crinoid stems
2865 Fossils, limestone, shells
2880 Fossils, silicified
2900 Fossils, bone (159A, 116)
2905 Fossil, sharks teeth, Chaco Canyon, Cliffhouse ss
2910 Concretions, undifferentiated (178, 178A)
2911 (178) Concretion, limonitic, sandy
2912 Concretion, hematitic, or ironstone, usually sandy
2913 Concretion, sandstone
2914 Concretion, pumiceous, calcareous Nambe
2915 Concretion, calcareous
2916
2920 Fossil, Fulgarite
2930 Geodes

Igneous Rocks
3000-3199
Lithic Code-20

3000 Granitic rocks, phaneric, felsic (granite, quartz, porphyry, qz-feldspar-porphyry
3001 Aplite, light colored, fine grained, sugary textured igneous rock
3005 Pegmatite, C2, Kspar, muscovite

3010 (172) Felsite, aphanitic (rhyolite); light colored volcanic rock
3011 Felsite, biotite, Gran Quivira temper
3015 Felsophyre, aphanitic groundmass with phenocrysts (rhyolite, etc.)
3020 (152) Intermediate, and Syenitic rocks, phaneric, felsic (feldspar porphyry, etc.) phaneric
3025 Intermediate, fine grained (1 mm), undifferentiated (Aplitic)
3030 Intermediate and Syenitic rocks, aphanitic (trachyte), Felsophyre
3035 (153) Intermediate and Syenitic rocks, felsophyre
3036 Intermediate and Syenitic rocks and felsophyre + hornblende
3040 (156) Gabbro, phaneric, mafic (gabbo, olivine gabbro, etc)
3041 Gabbro, phaneric, mafic, Gila cliff
3050 Basalt, aphanitic, mafic (basalt, etc.) "trap"
3055 Melaphyre, aphanitic with phynocrysts
3056 Lamprophyre, dark dike rock

Igneous Rocks
3100-3199
Lithic Code 21
(felsic)

3100 Granite, undifferentiated
3101 Granite with pink-orange feldspar, Precambrian, Sangre de Cristos, Jemez Mts.
3105 Granite, Capitan Alaskite
3110 Aplite, undifferentiated, Light colored, sugary textured igneous rock
3130 Quartz monzonite
3150 Rhyolite, undifferentiated
3160 Quartz latite
3170 Syenite, undifferentiated
3171 Syenite, hornblende (Abo temper)
3172 Syenite, hornblende (Jornado Brn temper) Sierra Blanca, gray feldspar
3180 Trachyte, undifferentiated
3181 Trachyte, Chuska Mts. (Temper)
3190 Foidal syenite
3195 Phonolite
3196 Monchiquite

Igneous Rocks
3200-3349
Lithic Code 22
(intermediate)

3200 Monzonite
3201 Monzonite, altered (sericitized)
3220 Tonalite (granodiorite)
3240 Diorite, undifferentiated
3241 Diorite, hornblende, undifferentiated
3242 Diorite, hornblende, Four Corners area, (temper material)
3243 Diorite, augite (temper La Plata District; Shepar 1939)
3260 Augite latite, Espinosa volcanics (San Marco temper)
3261
3263 Augite latite, aphanitic, fine matrix with red black specks (Gipuy temper)
3264 Augite latite with magnetite clusters, Espinos volcanics
3265 Augite latite with biotite
3266 Latite, hornblende, undifferentiated
3267 Latite, hornblende, (Datil volcanics?)
3270 Latite, hornblende, Espinosa volcanics (Tonqu temper)
3280 Dacite, undifferentiated
3300 Andesite, undifferentiated
3301 Andesite, hornblende, undifferentiated (San Juan Valley) (temper material)
3265 Espilatite and biotite, minute black specks

Igneous Rocks
3350-3499
Lithic Code 23
(Gabbro, basalt, mafic)

3350 Gabbro, undifferentiated
3370 Foidal gabbro
3390 Foidal basalt
3391 Monchiquite, minette, dikerocks of Chuska Valley
3400 Basalt, finely crystalline, indurated
3401 Basalt, finely crystalline, platy
3402 Basalt, finely crystalline, maculose
3404 Basalt
3405 Basalt, finely crystalline, amber to gray, intergranular, (temper), Cochiti area
3406 Basalt, finely crystalline, flaky fragments, red to near black, Cochiti area
3410 Basalt, fine grain, indurated (trap), dull luster
3420 Basalt, diabase, undifferentiated
3421 Basalt, diabase, Zia area

Igneous Rocks
3500-3649
Lithic Code-24
(obsidian and related rocks)

3600 Obsidian, Arizona ?
3601 Obsidian, San Francisco Field, Arizona
3602 Obsidian, Superior, Arizona

3610 Obsidian, Nevada 40 mi Canyon
3620 Obsidian, Guayamos area, Mexico
3625 Obsidian, Guatamala
3615 Obsidian, California (?)

Igneous Rocks
3650-3699
Lithic Code-25
(pumice and related rocks)

3650 Pumice, undifferentiated
3651 Pumice, cellular with obsidian, Jemez Mtns. (151F), burned obsidian?
3652 Perlite, (welded pumice), white, etc., Peralta Canyon?, Jemez
3653 Pumice, popcorn (El Cajete?), Jemez Mtns.
3654 Pumicite, white, chalk-like, compact, Bishops Lodge Fm., etc. - see 3880
3655 Pumice, crystal, Jemez Mts., coarse, subhedral, high quartz crystals
3660 Perlite, spheralitic, Jemez

Igneous Rocks
3700-3799
Lithic Code-26
(vitrophyres)

3700 Vitrophyre, black, dense, conchoical fracture, undifferentiated (164)
3701 Vitrophyre, Cochiti area (164A)
3702 Vitrophyre, Rio Arriba, "Glassy andesite" (164B)
3703 Vitrophyre, Valencia county, black (164C)
3704 Vitrophyre, Catron county
3705 Vitrophyre, black glassy, axls
3706 Vitrophyre, 3701 + vesicles
3710 Vitrophyre, dark gray to black, with hyperthene (andesite?), often vesicular with crystals, ash flow tuffs, Jemez
3730 Virophyre, rhyolitic, red, grays, purples, etc., (164D), Glassy welded
3731 Vitrophyre, rhyolitic, piperno with clear crystals, glassy welded
3732 Vitrophyre, rhyolitic, piperno, no xls, chert-like
3740 Vitrophyre, intermediate glassy

Igneous Rocks
3800-3849
Code 27
(pyroclastic rocks)

3800 Tuff, undifferentiated
3810 Tuff, welded, rhyolitic or ash flow
3811 Tuff, welded, rhyolitic devitrified, Jemez Mts. (168A)
3812 Tuff, welded, rhyolitic, platy, banded, Jemez Mts. (168C)
3813 Tuff, welded, rhyolitic, lapilli, pumice and crystals, etc.
3814 Tuff, welded, rhyolitic, LA 8675, LA 6538, Gila Cliff, dense compact.
3815 Tuff, welded, rhyolitic, glassy + xls (misc.)
3816 Tuff, welded, rhyolitic (?), white soft matrix, (Mogollon temper type, undifferentiated)
3820 Tuff, welded, intermediate
3821 Tuff, welded, altered andesitic, crystals, (temper material)
3830 Tuff, crystal (168), undifferentiated

Igneous Rocks
3850-3999
Code 28
(pyroclastic rocks)

3850 Tuff, lithic, undifferentiated
3851 Tuff, lithic, sandy (Gila Cliff)
3852 Tuff, Xl lithic
3853 Tuff, Xl lithic, sandy
3860 Tuff, hybrid, misc (168B)
3860 Tuff, vitric, undifferentiated
3861 Tuff, vitric, earthy red, powdery altered
3862 Tuff, vitric, white, undifferentiated, Jemez Mts.
3863 Tuff, vitric, black shards, Pajarito Plateau
3900 Agglomerate
3905 Volcanic breccia
3910 Lapilli tuff
3964 Tuff, vitric, white + fine colored sand (Nambe, Tesuque area temper)

Metamorphic Rocks
4000-4199
Code 29
(quartzites and related rocks)

4000 Quartzite, undifferentiated
4001 Quartzite, white, coarsely crystalline, Rio Grande axial gravel (lightening stones)
4002 Quartzite, gray banded, cobbles, Rio Grande axial etc.
4005 Quartzite, misc, cobbles
4006 Quartzite, pebble cg
4010 Quartzite, very fine grained, silt-sized, undifferentiated
4020 Quartzite, cobbles, fine grained, friable (temper materials)
4050 Quartzite, micaceous, undifferentiated
4060 Quartzite, very fine grained, dark red, conchoidal fracture (high gravel, Chaco)

4100 Quartzite, with anadalusite, kyanite, or sillimanite
4120 Quartzite, with hematite, Tijeras Canyon
4140 Quartzite, feldspathic
4165 Quartzite, metasandstone, undifferentiated
4170 Quartzite, metasandstone, fine grained, Manzanos

Metamorphic
4350-4399
Code 30
(Argillites, slates, phyllites)

4200 Argillite (140, 141, 143)
4201
4250 (185) Slate
4251 (185A) Slate, dark gray, platy, soft, brittle, Cochiti area
4300 (176) Phyllite, undifferentiated
4301 (188) Phyllite, Cochiti area, dark gray to black

Metamorphic
4350-4399
Code 31
(Hornfels and spotted)

4350 Hornfels, dark, fine grained, pelitic, undifferentiated
4351 (4201) Hornfels, light green, siliceous, Rio Grande Valley, San Pedro Mts., Mancos Shale
4352 Hornfels, black
4353 Hornfels, altered Mancos Shale, Cerillos, banded gray
4360 Spotted hornfels or slate, maculose texture
4370 Metarhyolite
4375 Metasyenite, Metaandesite
4380 Metabasalt (melaphyre)

Metamorphic
4400-4449
Code 32
(marble and related rocks)

4400 Marble
4410 Skarn (calc-silicate rock, pyrometasomatic)
4420 Tactite (complex mineralogical, contact metamorphic)

Metamorphic
4450-4690
Code 33
(schists)

4450 Schist, undifferentiated
4510 (160) Schist, hornblende (schistose)
4515 Amphibolite (or hornblende gneiss) (see 475
4516 Amphibolite, (Hb biotite gneiss)
4520 Schist, green (160A) (187), schistose, misc
4521 Schist + metallic grains
4525 Greenstone, massive
4526 Greenstone, massive, black - Rio Grande ax
4527 Greenstone, Tijeras Precambrian
4530 Schist, sillimanite (and gneiss), fibrolite (18
4531 Schist, quartz sillimanite
4540 Schist, biotite, undifferentiated
4550 Schist, muscovite, undifferentiated (160B)
4551 Schist, muscovite, garnet
4555 Schist, Quartz or metasandstone
4560 Schist, quartz muscovite
4561 Schist, quartz - Tijeras Canyon, Deadma Curve
4562 Quartz, Micro Schist, Northern Sandias
4570 Schist, talc (soapstone, includes undifferen ated artifact material such as sericite, serpenti etc, if too small for identification)

Metamorphic
4700-4899
Code 34
(Gneiss)

4700 (175) Gneiss, undifferentiated
4710 Gneiss, quartz feldspar (granite)
4720 Felsic granulites
4721 Leptites - halleflinta
4730
4750 Gneiss, hornblende
4751 Gneiss, hornblende (Quarai temper)
4755 Epidote gneiss (tactite) coarse grain

Metamorphic
4900-4999
Code 35
(misc.)

4950 Slickensides and gouge (139A, 180)
4960 Gangue, altered country rock

Minerals
5000-5049
Code 36

5000 Quartz, crystalline, misc.
5001 Quartz, amethyst
5002 Rose Quartz
5010 (120) Quartz, rock, colorless
5011 (120A) Quartz, rock, milky
5015 Quartz vein
5020 (120C) Quartz, crystals, misc.
5030 (120B) Feldspar crystals
5031 Feldspar crystals, sanidine, ± moonstone
5032 Amazonite
5040 (123B) Gypsum, rock
5041 (123) Gypsum, selenite
5042 (123A) Gypsum, alabaster
5043 Gypsite
5044 Satin spar
5045 Epsomite
5046 Alum (misc)

Minerals
5050-5099
Code 37

5050 (126) Calcite, massive, banded, fibrous, misc.
5051 (125) Calcite, Iceland Spar
5052 (125A) Calcite, crystal forms
5053 Calcite, white, massive, seams for beads, pendents
5054 Calcite, plates in upper Chinle, Ft. Wingate, Puertocito, pink
5060 (126A) Aragonite, misc.
5061 Aragonite, banded gray, Lucero Mess (see Travertine)
5062 Aragonite in Kkf, Escavada Wash., Alemita wash
5070 (124) Barite, misc
5071 Siderite (amber-Kirtland-Fruitland Fm, San Juan)
5075 Halite
5076 Sylvite
5080 (190) Mica, misc
5081 (190) Mica, muscovite, sheets, books
5082 (157E) Sericite
5087 Rhodochrosite
5088 Rhondonite
5089 Lepidolite
5090 Fluorite
5095

Minerals
5100-5299
Code 38

5100 (120) Limonite, dark brown, massive, misc
5110 (122A) Limonite, earthy, yellow ocher, misc.
5111 (122) Limonite, sandy, calcareous, misc.
5150 Magnetite
5200 (127) Hematite, massive, compact, black-red
5210 (127A) Hematite, specularite, misc.
5211 Hematite, specularite, crystals - Cochiti, Tesuque areas
5220 (127B) Hematite, red ocher, earthy, misc.
5221 Hematite, red ocher, earthy, in sandstone
5290 Arosite and related yellow, friable, finely crystalline

Minerals
5300-5425
Code 39

5300 Turquois, misc. (128)
5301 Turquois, Cerrillos
5302 Turquois, Tyrone, N.M.
5310 Azurite, misc. (128A)
5311 Azurite, in sandstone
5320 Malachite, misc
5321 Malachite, in sandstone
5330 Chrysocolla, misc
5337 Tourmoline
5338 Beryl
5339 Emerald
5340 Epidote
5341 Garnet
5342 Tourmaline
5343 Olivine
5344 Kyanite
5350 Wollastonite
5400 Sulfur (192)
5410 Talc (soapstone, pyrophyllite) (157A,B) see 4570
5411 Talc, schist (?)
5415 Sepiolite
5420 Serpentine, misc.
5421 Sepentine, riccolite

Minerals
5425-5552
Code 40

5425	Asbestos
5426	Jadeite
5427	Nephrite
5430	Gisonite
5550	Galena
5501	Litharge
5502	Ceruasite
5503	Anglesite
5508	Bormite
5509	Chalcocite
5510	Chalcopyrite
5511	Pyrite
5512	Molybdenite
5513	Pyrolucite
5514	Psilomelane
5515	Orpiment - regular
5520	Trinitite
5550	Copper (native)
5551	Gold (native)
5552	Silver (gold)

Materials
0001-0999
Code 41
(non-lithic)

0001	(159) Bone
0002	(177) China or crockery
0003	(129) Coral
0004	(158) Glass
0005	(182) Metal
0006	(183) Plastic
0007	(184A) Plaster (of paris)
0008	(163) Shell
0009	(181) Sherd
0010	(184) Miscellaneous non-lithic
0011	(169) Wood
0012	Slag, glassy
0013	(159A) Bone, petrified
0014	Adobe
0015	Brick
0016	Tooth (bone)
0017	Pigment, light green
0020	Iron
0114	Burned Adobe

Appendix 11-3 • Table Titles, Chapter 11

Appendix 13-1 • Test Excavations At Site E 1A

David "A" Gillio

Site E 1A was discovered in August 1981 by a survey team working on lands proposed for exchange as part of the Elena Gallegos project. The site report form, prepared by Belinda McFerrin, indicated historic period remains that seemed of sufficient interest to warrant further examination. To that end, the author spent several days on the site with a crew from the USFS Regional Office laboratory to map the site and make further collections.

The site is recorded as being located in the NE1/4 of the NW1/4 of Section 26. It is very near the boundary of the project; a formal land-net survey would be required to inform us of its exact relationship to the boundary. Our best estimate is that most of Feature D and the largest trash scatter (Map A13-1) is within the project area and that Features A, B and C are outside the project area.

On September 20, 1921, John C. Webb received a homestead patent on lands in Sections 23 and 26. In Section 26, these included the SW1/4 and the N1/2 of the NW1/4. In 1925, Webb received a stock-raising homestead patent on more land in the same sections. These included the entire NE1/4 of Section 26. The SE1/4 of the NW1/4 remained public domain.

Webb's original patented land in the NW1/4 remains in private hands. His land in the NE1/4 has been reconveyed into public domain. When this happened is presently unknown. It is possible that Webb didn't meet the five-year settlement requirement, but this has not been demonstrated.

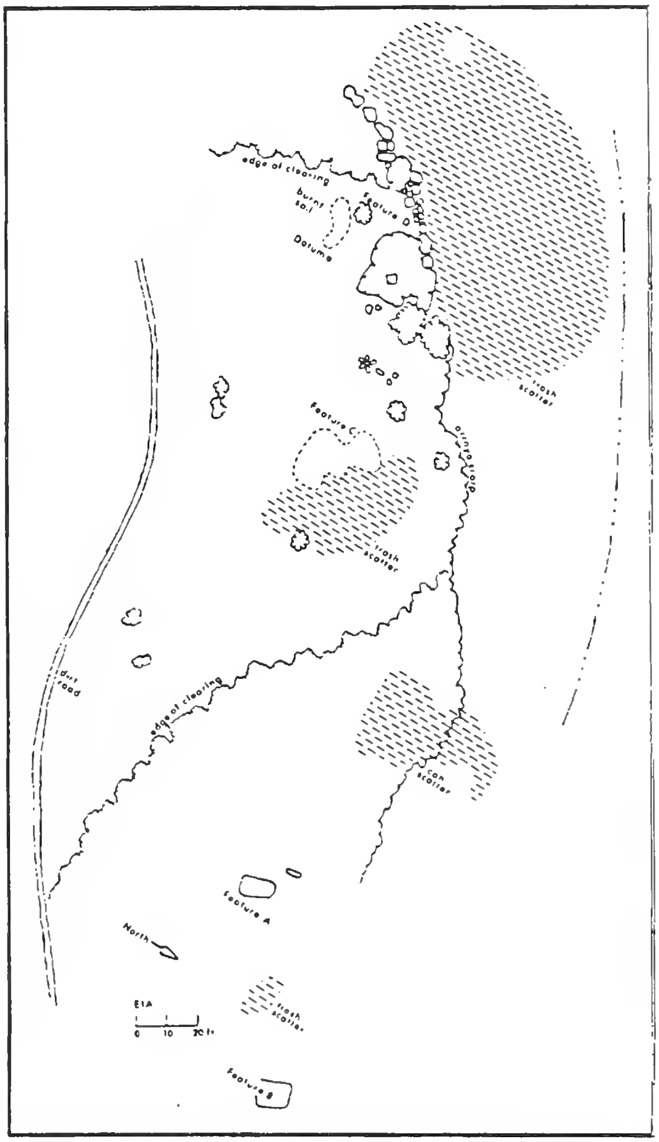
Site E 1A is recorded as being at the northeastern corner of the SE1/4 NW1/4. It is entirely possible, given the problems with locating tracts on the ground with respect to boundaries, that the site may be either, (1) in the private land to the north of the parcel, or (2) in public domain in the NE1/4, outside of the exchange boundary.

Site E 1A may be a cattle camp dating from Webb's use of the area. A homestead patent for the entire NW1/4 was applied for in 1909. It was cancelled in 1911.

Feature D (Map A13-2) was the most interesting portion of the site that is clearly of historic period usage. This feature is perched on the edge of an arroyo scarp. A small stream has cut down through local limestones to create this setting. At the time of our visit, in late fall, there was a small amount of surface water available from the stream. The feature is dominated by a pile of sandstone which has a firepit near its center. The sandstone, of irregular shape,. appears to rest on a crudely prepared foundation fashioned by cementing together the local limestone.

The function of the sandstone mass could not be determined. It was suspected that it is the remains of some sort of kiln, but there appears to be insufficient material on the site to have built a satisfactory kiln. Although there is enough stone to have built a small oven, the sizes of the individual stones seem too large. It also seems odd that sandstone would have been imported to the site just to make a domestic oven.

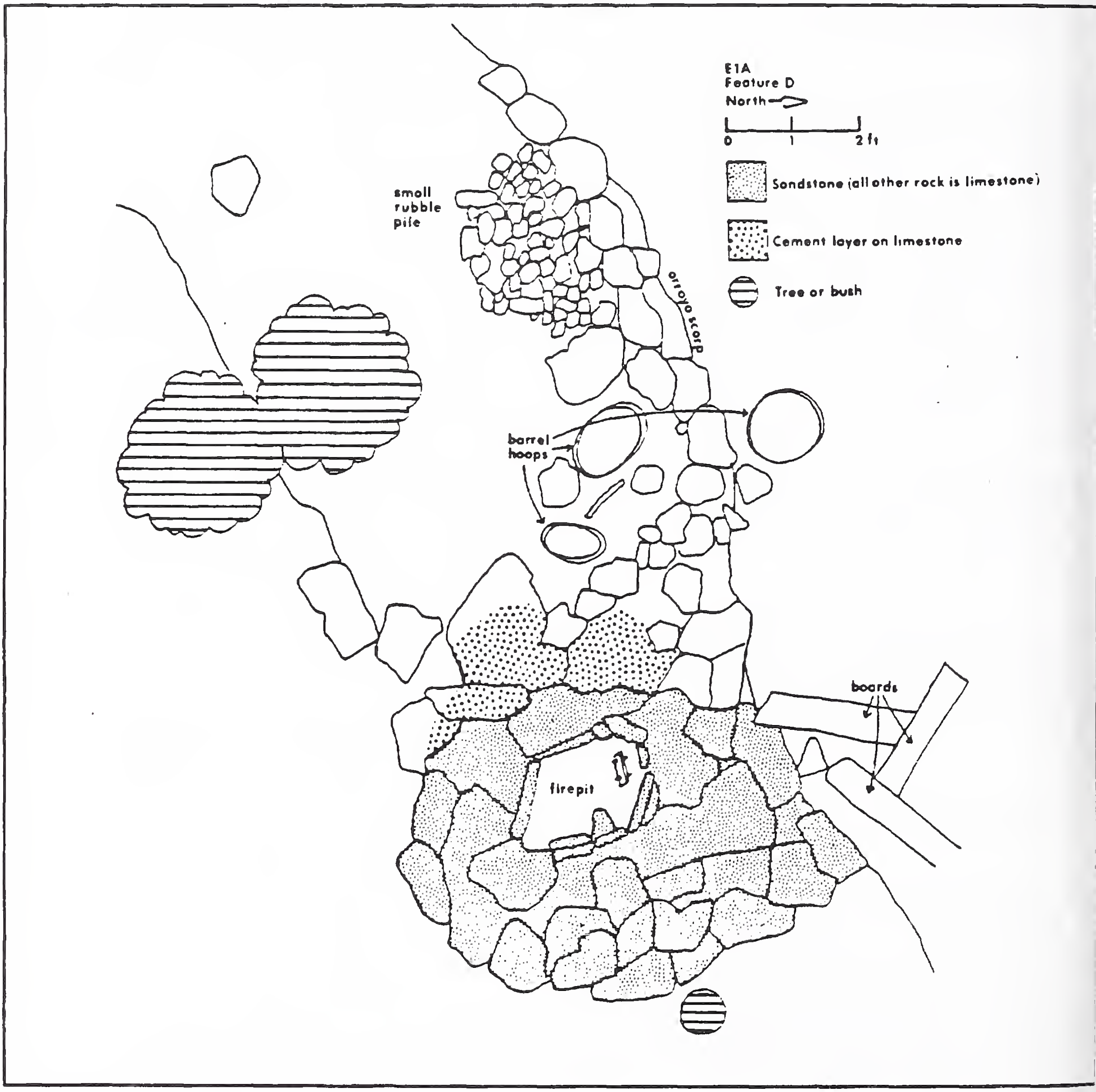
Feature A (Map A13-3) consists of two rock alignments of approximately rectangular shape. It is not at all



Map A13-1. Features and trash scatters at Site E 1A.

certain that these are of historic period age or that they were functionally part of the occupation that created Feature D. They were included as part of the site mainly because the thin scatter of tin cans and other historic artifacts extended into this area.

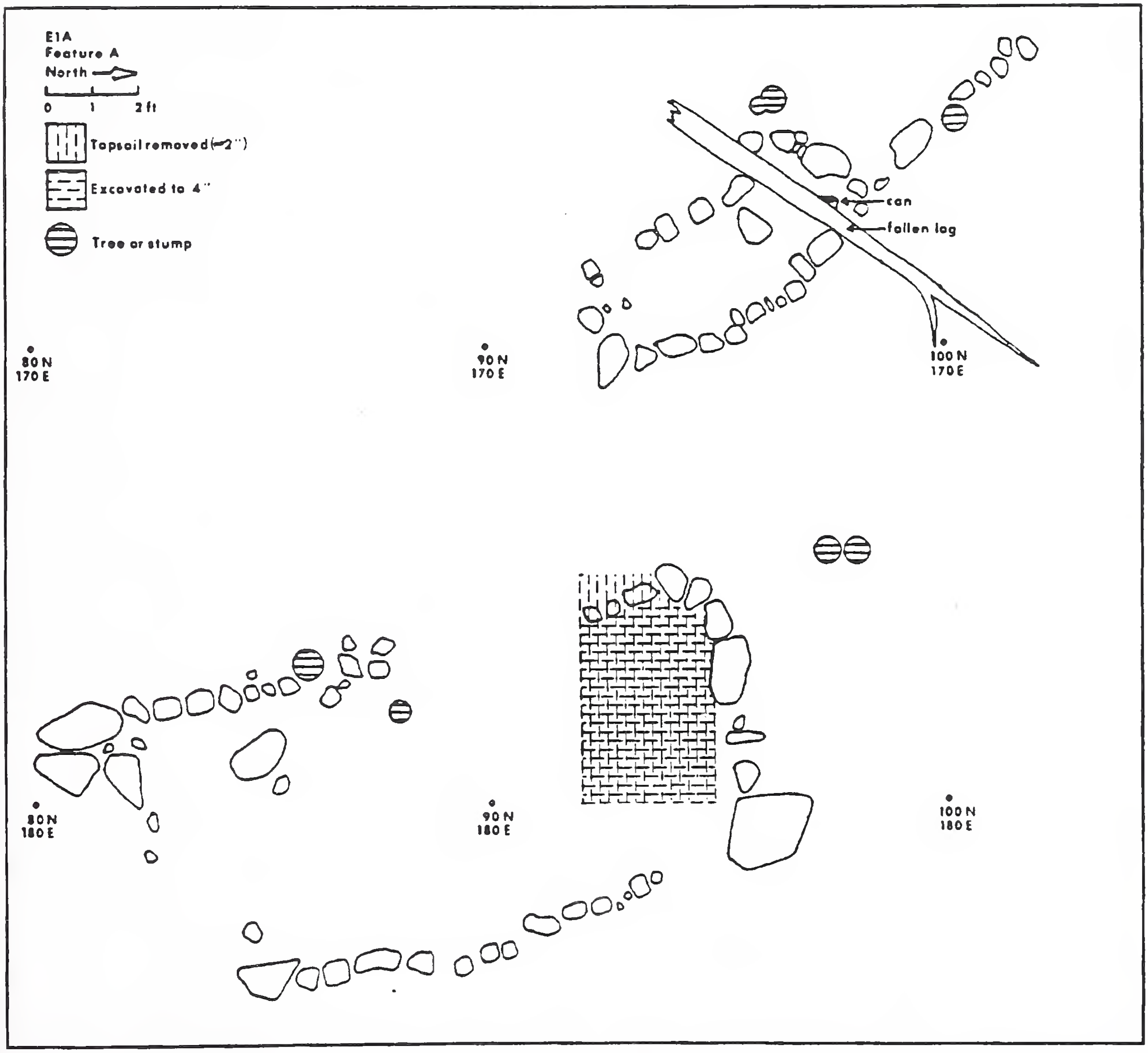
A small test pit was excavated into the north end of the larger rock alignment of Feature A. At a depth of four inches it was clear that we had reached sterile, undisturbed soil. No artifacts were recovered from the test and no light was shed on the age or purpose of the alignment.



Map A13-2. The firepit, Feature D, at Site E 1A.

Another small test pit was made in Feature B (Map A13-4), another alignment of rocks only one stone high. As in the previous test, nothing was found and no conclusions were reached about the age or purpose of this feature. In size and shape it is suggestive of aboriginal construction, but nothing was found to exclude the possibility that it was associated with the historic components of the site.

Feature C (Map A13-5) was not excavated, but there was a large quantity of associated historic artifacts which allows interpretation. Most of the artifacts seen can be classed as household trash. There were many fragments of window glass and crockery as well as tin cans. This is also very near the largest trash scatter (see Map A13-1). A rough stone alignment may be the remains of a wooden cabin's foundation; there are

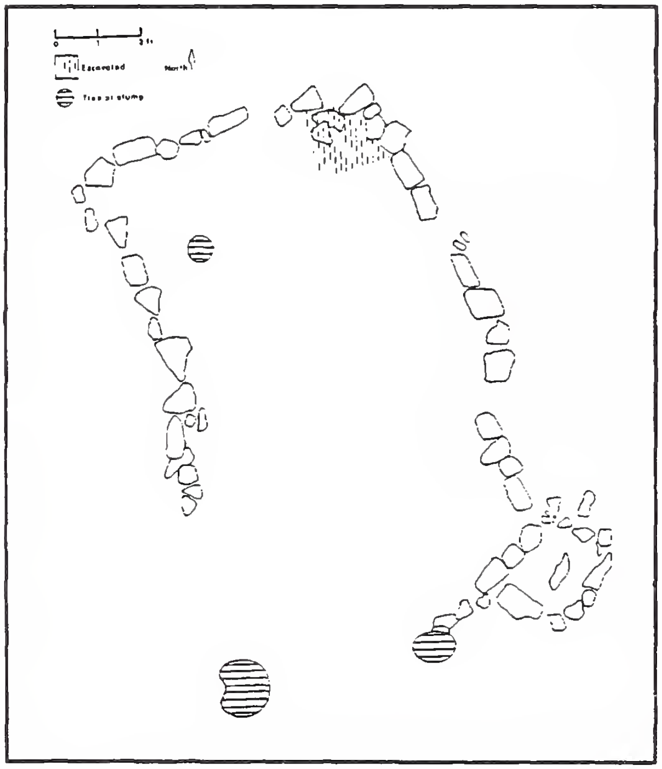


Map A13-3. Feature A of Site E 1A.

board fragments and many nails in the vicinity which could have come from the fabric of a small dwelling. The window glass occurs in several concentrations, all of which are northeast of what I interpret to be the cabin foundation. A short length of wire and an attached insulator came from near the northwest corner.

A representative sample collection was made from the trash areas and from the general litter across the site. The majority of the artifacts recovered can be dated in only the most general sense. It is clear that all but a few are historic and non-aboriginal. The few exceptions, a projectile point and sherds, probably were carried onto the site by its historic-period occupants. None of the aboriginal materials was found in association with Features A or B. Rather, they came from the general vicinity of the cabin foundation and major trash area.

Artifacts of the historic period, in a few instances, provide very precise dates. Perhaps the best examples are the baking powder cans, whose lids indicate a use date of circa 1925. This date is consistent with the date ranges assigned to several kinds of manufactured goods, including bottles, cans and automobile parts. A radiator frame (not collected) bears the "Ford" trademark and seems to have come from a vehicle in the Model A line.



Map A13-4. Feature B at Site E 1A. Test excavations at the north east corner were four inches deep.

Notable among the general scatters across the site, and particularly in the dumps, is a paucity of glass bottles or bottle fragments. Given the large quantity of tin cans found, one might expect to have found many more glass vessels.

Also notably scarce were fish and meat cans. There is a rusty roasting pan in the dump area, and oven parts are scattered across the site. It seems safe to assume that the diet of the site's occupants featured fresh meat and a high percentage of canned vegetables and fruits. The essentially domestic nature of the site is indicated by those kinds of remains and is supported by other domestic trash, notably the pottery. Sherds from at least five wares were collected. All of the historic sherds appeared to be from inexpensive utility wares more notable for their variety than quality.

Records generated from testing of site E1A consist of two rolls of 35 millimeter film, one in color; the maps included with this report and 96 artifacts which have been analyzed and entered in the Elena Gallegos catalog record. In addition, two charcoal samples were collected from the sandstone hearth area but were not analyzed.

Artifact Analyses: Artifacts from survey and testing were analyzed as a collection. The collection includes 15 bottle glass fragments, 11 cans, one cartridge, seven nails, one window glass fragment, 12 dinnerware shards and a coffee pot lid. Fasteners include three buttons, a belt buckle, an overalls rivet, a fastener and strap adjuster, an overshoe fastener and a bridle bit. Also collected were battery fragments, a lid to a cleanser container and a top to a small tin container. Datable items include six purpled bottle glass fragments (two have maker's marks: one of "Mason," dated 1858 to present [Toulouse 1972:344-345] and one of "Armour's, Top Notch Brand, Chicago" [no date]). Several datable cans were also collected. A "KC BAKING POWDER" tin embossed with "Same Price For Over 35 Years" dates from 1925 to 1927 (Ward et al. 1977:240).

A "Cuticura" cold cream container is embossed with the registered date of 1878.

One coffee can lid has been reutilized as a sheep rattle or bell. The modification has partially destroyed this undated embossed label:

ADENOUR - BAKER
GROCERY
COMPANY
WHOLESALERS
MANUFACTURERS
IMPORTERS
KSAS CITY, MO.

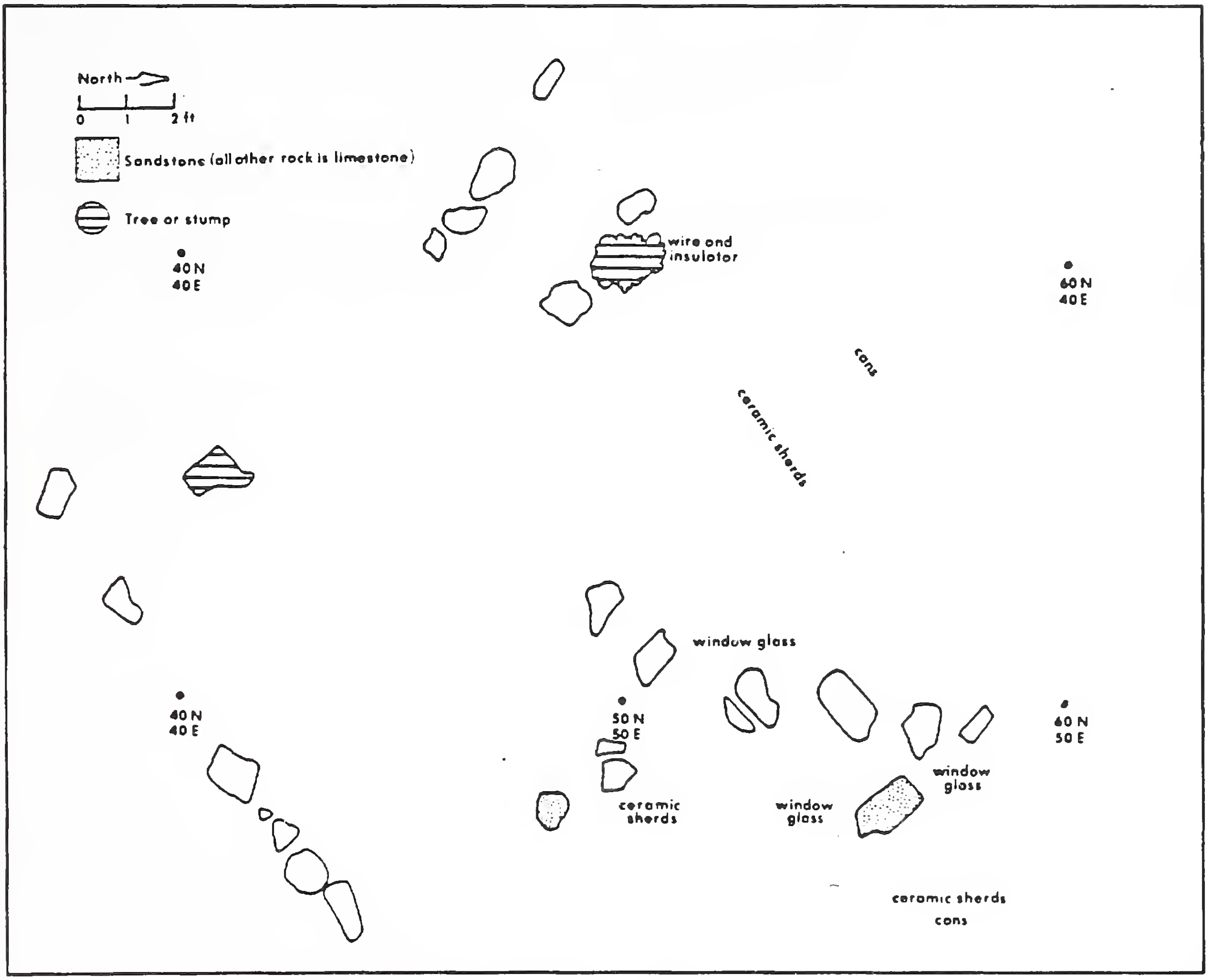
A "Walter Baker Co. Ltd." cocoa can lid (no date) was also collected. Two other dated items include an "Old Dutch Cleanser" container. A patent date of "May 14, '07" is inscribed on the top. The other item is a top to a container embossed with the following:

Pat'd Dec 7-15

Shaler

Jan 18-16 Jan 18-18

Date Range: about 1920s.



Map A13-5. Feature C, possibly a cabin foundation, of Site E 1A.

Appendix 13-2 • Investigation of Site ED 1A

David "A" Gillio

Site ED 1A was initially recorded as part of the Elena Gallegos survey in July 1981. The report of that survey described the site as having a "dugout" and probable structure(s), and these were in association with a mine pit. Minor surface artifacts found included some tin cans which could date the site to the turn of the century.

The mine is a sort of drive-in affair. It appears to have been excavated with a front-end loader, or similar equipment. The pit is about 30 feet deep and has support framing only in a small area at the bottom. A small conifer has established itself near the bottom of the pit, the width of the excavation allowing plentiful light to reach it. The tree is about a dozen years old and suggests a date of final occupation of the mine. Since the excavation appears rather fresh and would have been quick work for a front-end loader, my best guess is that the mine was started and abandoned after 1960. There were no datable artifacts in the vicinity which would contradict that date.

The "dugout" proved to be much less than anticipated. Rather than the anticipated underground dwelling, such as found sometimes associated with Civil War military sites, it was simply a flat area. The term used only reflected the fact that the toe of a slope had been removed, presumably to create a suitable place for a dwelling. I suspect that the dwelling was a mobile home as the dimensions are about right and there were no nails, broken glass, or other such trash as often marks a former building site.

There are two lines of rocks in the ground. The initial report suggested that they might be the remains of a porch foundation. I did not find that hypothesis convincing. Again, the lack of structural debris argues against such an interpretation. There is too little information available in those rocks to make a solid case for their use. If my trailer hypothesis is valid, the stones may have marked a parking area or small garden.

There is an area containing some hole-in-top cans and old stove parts. I do not believe that we can demonstrate association of those artifacts with the mine or dwelling area. Rather, I suspect that these few artifacts represent the remains of some temporary field camp of cowboys, and pre-date all other features at the site.

A record search did not provide any useful clues to aid in interpretation of the site.

Appendix 13-3 • Investigation of Site ED 2A

David "A" Gillio

Site ED 2A was discovered by surveyors working on the Elena Gallegos project and initially described in report number 15 A. The summary description of the site stated that it is, "A depression-era camp consisting of several dugouts, a concrete well, single-course stone walls, and a road. A scatter of historic trash was associated. License plates dating to 1934, 1937, and 1939 were retrieved."

Historical archeologists from the USFS Regional Office visited the site with the intention of testing the dugouts and preparing more detailed maps of the site. Neither of these steps were taken because the surface indications were considered unpromising. The dugout areas do not appear to have been dwellings. In fact, the larger depression seems more likely to be a natural feature. Another dugout area was associated with trash, including scrap metal and a jury-rigged wind break of wood and odd bits of scrap.

Automobile parts make up a large proportion of the artifacts at the site. At least three different cars and trucks are represented and they are of an age contemporary with the 1930s license plates. Parts are so widely scattered that it appears that tossing them about was a recreation activity at the site. The lack of evidence for permanent habitation here suggests that valueless vehicles were simply dumped on this piece of public land.

A records search turned up the information that adjacent lands had been granted to Alma Alred (1922) and John Humphrey (also in 1922). Site ED 2A itself is on lands which have never been out of public domain. In 1934, William Garcia applied for a patent on all of Section 8 which was not held by Alred or Humphrey, but the application was cancelled in 1939. Evidently Garcia had not met the five-year settlement requirement. It seems reasonable to suppose that it was Garcia who was responsible for the small amount of stone work at the site, but this has not been established as a certainty.

A single-course stone wall may have been intended to curb erosion. The stone and concrete well is the most ambitious construction at the site. Presently, it is filled almost to the top with modern trash such as broken coolers and picnic debris. Since the location is not on any well-traveled route, we suspect that the well must have been very shallow.

The remaining objects at the site, such as the rude windbreak, are typical of trash left behind at contemporary hunter's camps. Temporary accommodations are fashioned out of oddments, and left behind when camp is broken.

I believe that the artifacts found at site ED 2A represent several distinct functions all of which were non-intensive and short-lived. A brief attempt at homesteading left no significant evidence other than the well and stonework. An episode of occasional trash dumping, including the discarded vehicles, has continued sporadically throughout the twentieth century. Finally, in recent years, outdoorsmen have briefly visited the area, and contributed to the litter which constitutes site ED 2A.

Appendix 13-4 • Testing of Site PL 1A

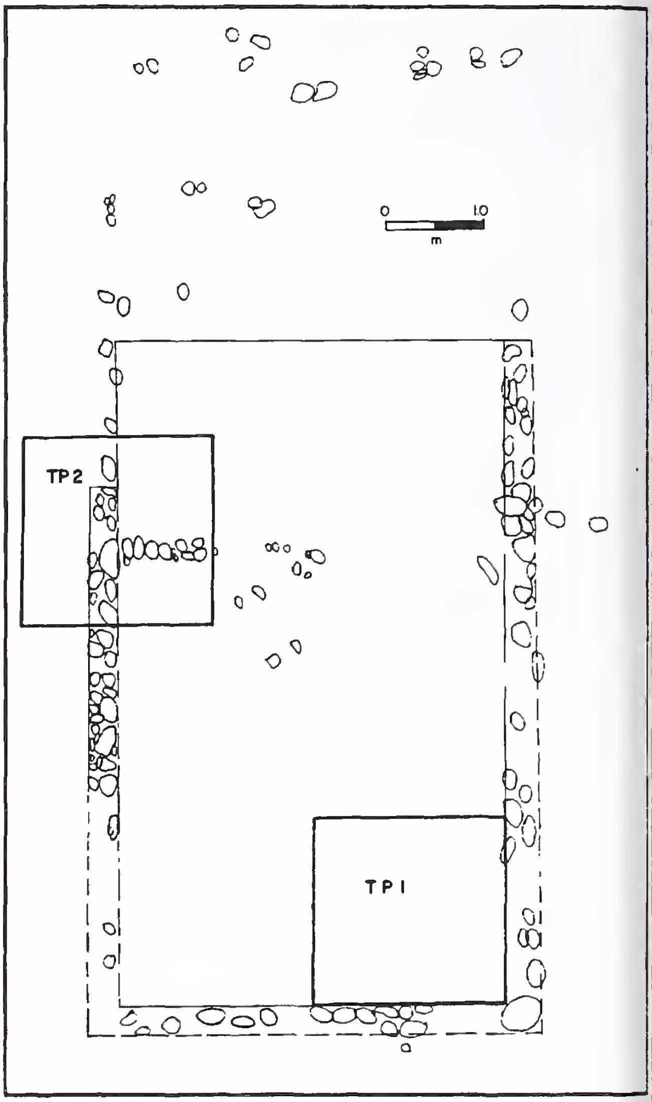
Joseph A. Tainter

Site PL 1A is an architectural site (Map A13-6) displaying cobble foundation stones, which are two tiers wide where they are fully exposed. There is an interior northeast-southwest partition dividing the structure into southeast and northwest rooms. The exterior walls are about 30 centimeters thick. A juniper root to the southwest of the structure displays ax cuts. Pieces of window glass were noted along the southwest wall of the structure. The site was tested on November 4, 1981.

Test Pit 1: This was a two by two meters unit set in the northeast corner of the structure. It was excavated to a depth of ten centimeters, except for a deeper test to 25 centimeters in the northeast corner of the test pit. The soil consisted of loose silt mixed with small gravel and pebbles. There was no floor nor any other feature. The fill was sterile except for a few pieces of tar. These are from the construction of an adjacent gas pipeline.

Test Pit 2: This was a two by two meters unit set on both sides of the southwest wall at a point where interior rocks indicated a likely wall partition. This unit contained the same type of loose, gravelly soil as Test Pit 1. It was excavated to a depth of ten centimeters, and was completely sterile.

There is no evidence for wall construction above the foundation at this site. Construction apparently was halted after the foundation was built. Neither an age nor an intended function for the structure can be inferred.



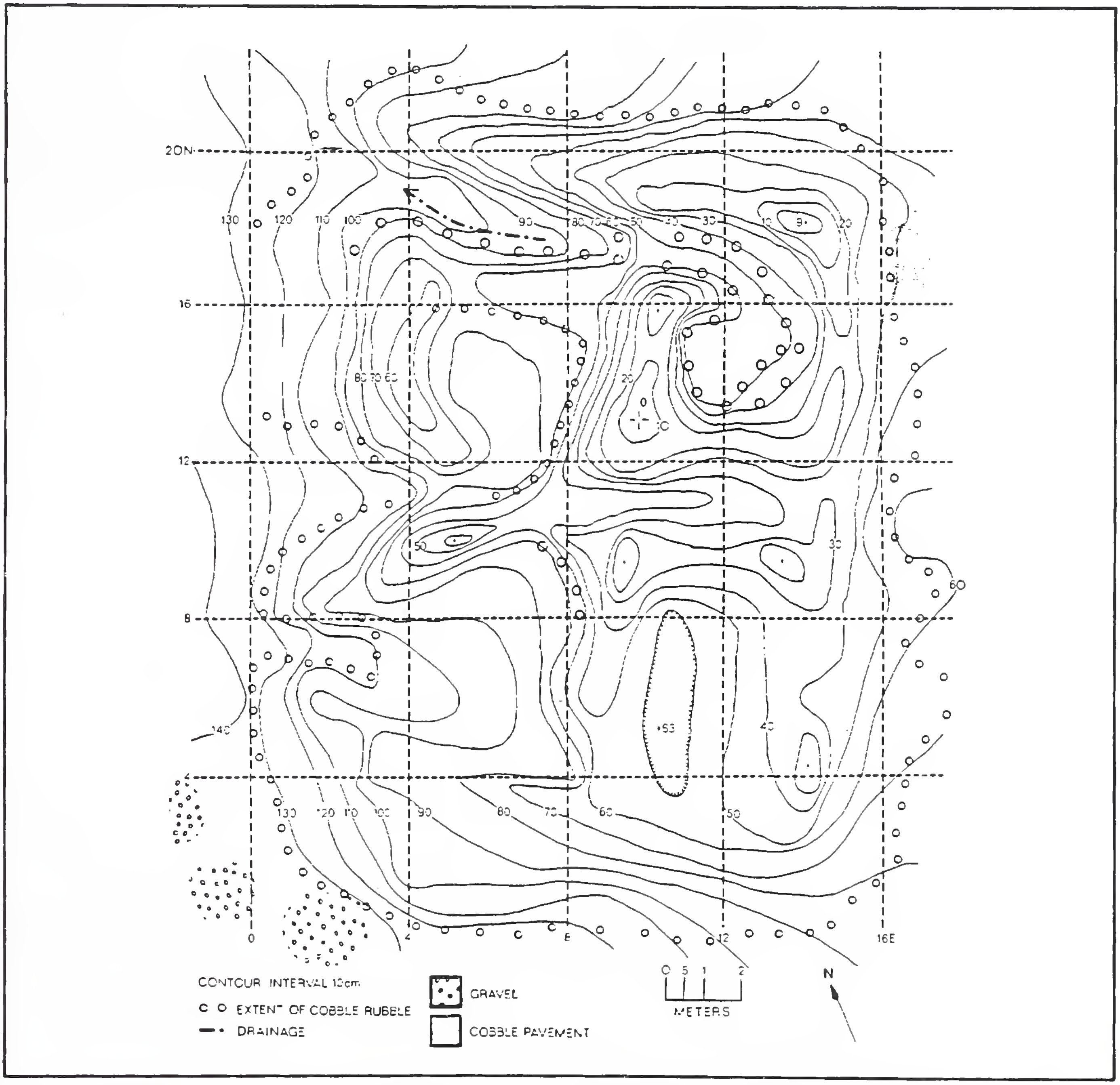
Map A13-6. Site PL 1A.

Appendix 13-5 • Excavation of Site PL 3A

Joseph A. Tainter

The Site

The major feature at PL 3A is a compact mound of masonry rubble (consisting of river cobbles), rising about one meter above the level of the surrounding terrain. In its original form, this structure measured 15 meters north-south and 11 meters east-west, for a total area of 165 square meters. Surrounding this structure is a light surface scatter of associated historic trash. Within this trash scatter are several rock piles of unknown function. A large depression off the southwest edge of the mound may have been a borrow pit for the



Map A13-7. The rubble mound at Site PL 3A.

adobe portion of the structure. Adjacent to the site are several sections of an irrigation ditch which once diverted water from Las Huertas Creek to fields on the mesa top on which PL 3A is situated. This system has been recorded as site PL 25A.

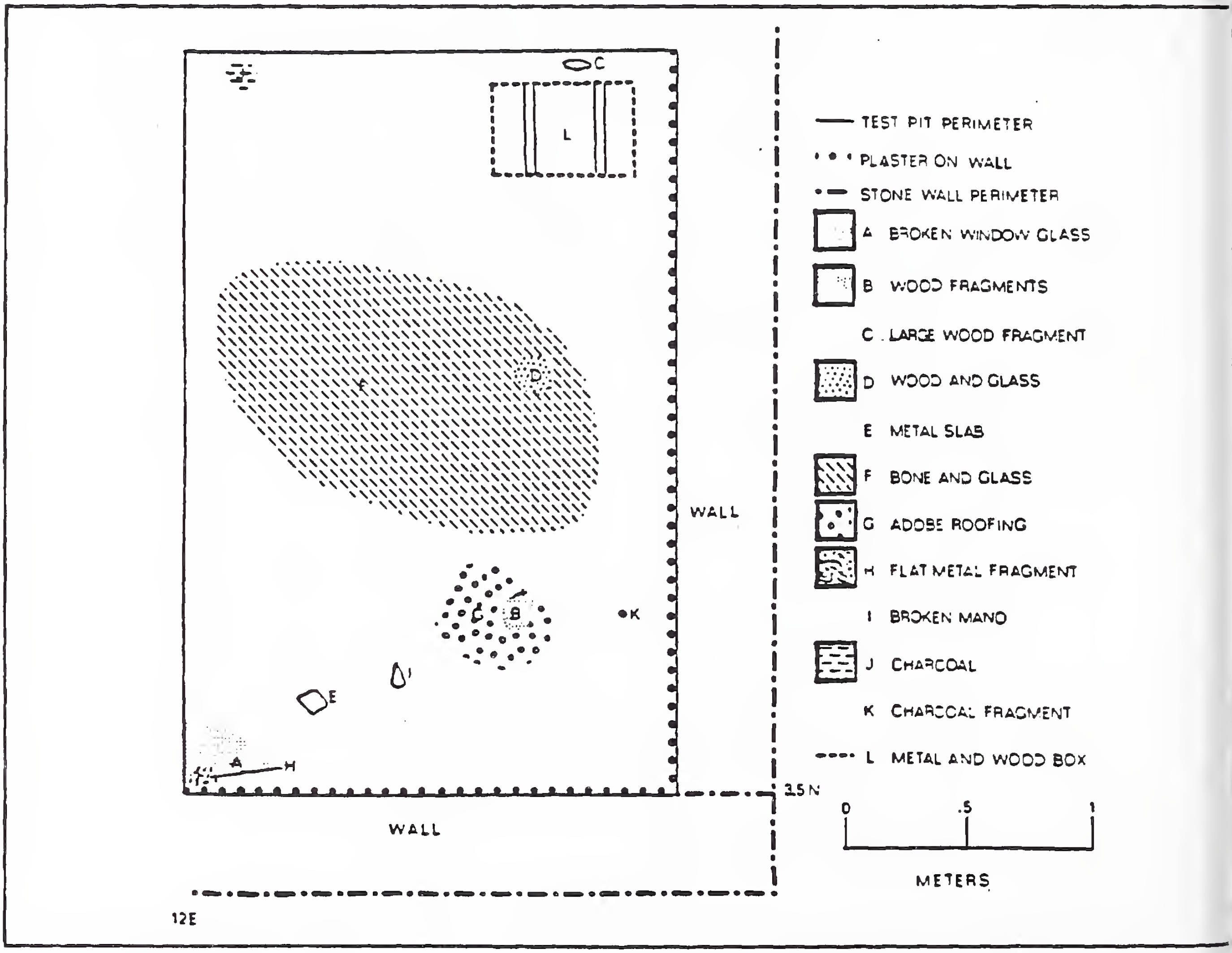
Investigation Methods

A map of the rubble mound and surrounding terrain was prepared by John Hayden and Joan Wilkes (Map A13-7). Subsequently, five test pits were excavated in the mound. The area excavated amounted to 35 square meters or 21.2 percent of the total area of the structure.

Since this was a short-term, single occupation site, all test pits were excavated from surface to floor without subdivision into natural or arbitrary levels. All soil wa passed through a 1/8" mesh screen except for steril deposits in the surface level of TP1, and in TP5. Exca vation began with shovel, and pick where necessary, i the rubble-filled upper levels of each test pit, proceedin to finer tools as artifacts and features were encountere in deeper levels. The excavations were directed by th author. In my absence, this task was capably handle by John Hayden.

Investigation Results

Test Pit 1 (Map A13-8): This test pit was established i the southeast corner of the southeast room. It measure three meters north-south and two meters east-west. packed adobe floor was encountered at a depth of 3



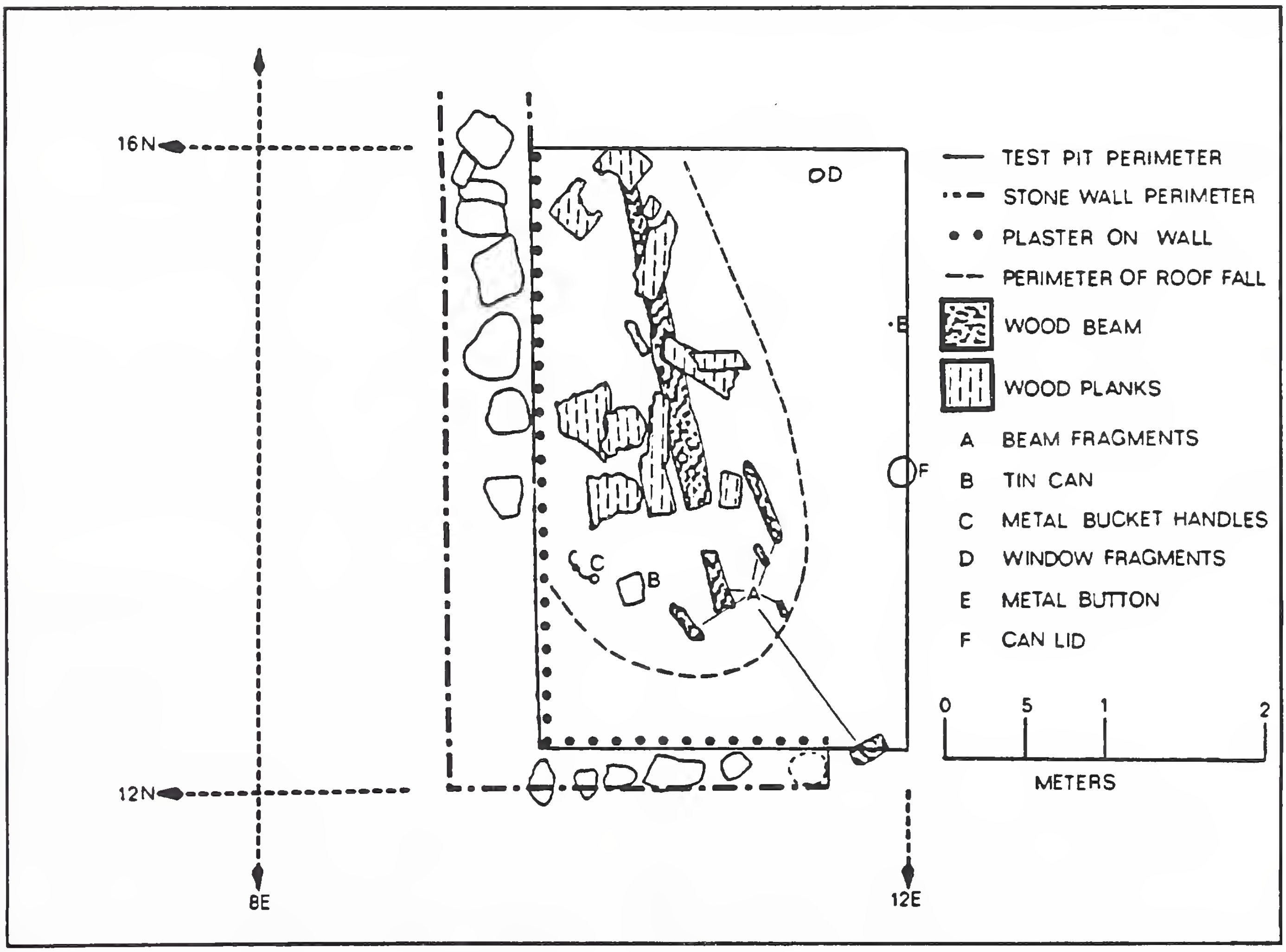
Map A13-8. Test pit 1 at Site PL 3A.

centimeters in the NW corner, 32 centimeters SW, 41 centimeters SE, and 49 centimeters NE. Plastered stone walls were uncovered along the south and east edges of the test pit. These walls had formed the outside of the structure.

Test Pit 1 was filled with fallen masonry to a depth of about 25 centimeters. From a depth of about 20 centimeters to the floor the soil had a heavy, adobe-like consistency contrasting with the loose, wind-blown silt above. This heavy soil represents melted mortar and plaster from the walls and adobe packed as a cap on the roof. At depths of 20 to 30 centimeters small pieces of wood roofing material were encountered. A sizeable (about 50 x 40 centimeters) piece of roofing adobe with beam impressions was found on the floor. The roof was built of milled lumber. The floor in this test pit consisted of hard, packed adobe easily delineated throughout the excavated area.

At the depth of about 20 centimeters (that is, some 12 to 20 centimeters above the floor) there was a concentration of glass and sawed cattle bones. The position of these bones above the floor indicates either post-abandonment deposition, or that carcass segments were hanging from the wall or ceiling.

In the southwest corner of the test pit, at a depth of 17 to 20 centimeters, was a concentration of broken window glass. On the floor itself were some amorphous metal fragments and a mano fragment. In the northeast corner of the test pit, on the floor, was a rectangular box. It measured 62 by 36 centimeters and had a preserved height of 6.5 centimeters. This box was built with wood



Map A13-9. Test Pit 2 of Site PL 3A.

sides, a metal band around its edge, metal straps over the wood side panels, and leather hinges or latches. It may have been a small suitcase.

A subfloor test along part of the south wall was cut to a depth of 15 to 18 centimeters. The prepared adobe floor proved to be five to six centimeters thick. This subfloor test was completely sterile.

Test Pit 2 (Map A13-9): This test pit measured 4 meters north-south by 2 meters east-west. It was excavated in the deepest part of the mound in the southwest corner of the northeast room. Depth to floor measured 65 centimeters in the northeast corner. Plastered stone walls were encountered along the west and south sides of the test pit. These were interior walls. In the southeast corner, along the south wall, a portion of a doorway was found. The relative stratigraphy here was the same as in TP1. Fallen masonry occurred in the top 15 to 60 centimeters of fill, underlain by 12 to 15 centimeters of melted adobe. About six to eight centimeters of burned roof material generally overlay the prepared adobe floor.

The contents of the room included metal buttons, a can lid, window and bottle glass, a bucket handle and a tin can filled with yarn. These last two items were found 18 to 25 centimeters above the floor, and so may have been set on shelves attached to the wall.

Much of the roof in this area had burned, and substantial sections of it were delineated during excavation. John Hayden, who supervised this part of the excavation, has suggested (Fig. A13-2) that the roof was built of three by five inch beams overlain by one inch thick planks. About two inches (five centimeters) of adobe capped the roof.

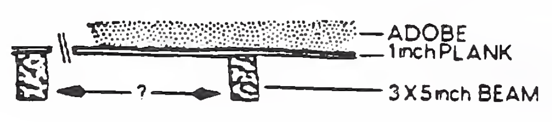


Fig. A13-1. Suggested reconstruction of Test Pit 3 roof.

Test Pit 3 (Map A13-10): This test pit was established in the southwest corner of the southwest room. It measured three meters north-south by two meters east-west. The packed adobe floor encountered in TP1 and TP2 was not so clearly evident throughout this unit. It was possible to delineate segments of it, but in other places it was difficult to discern. The level on which the floor would have been located was 21 centimeters deep in the NW corner, 36 centimeters SW, 32 centimeters SE and 22 centimeters NE. The west and south edges of this test pit were bounded by plastered stone walls which formed part of the outside wall of the structure. The stratigraphy in TP3 substantially matched that already described: masonry and wind-blown silt overlying adobe wall melt and roofing, in turn overlying the floor. This unit was more nearly sterile than some of the others. Little of the roof was found other than some nails. Two can lids were found in the southwest corner resting on the floor.

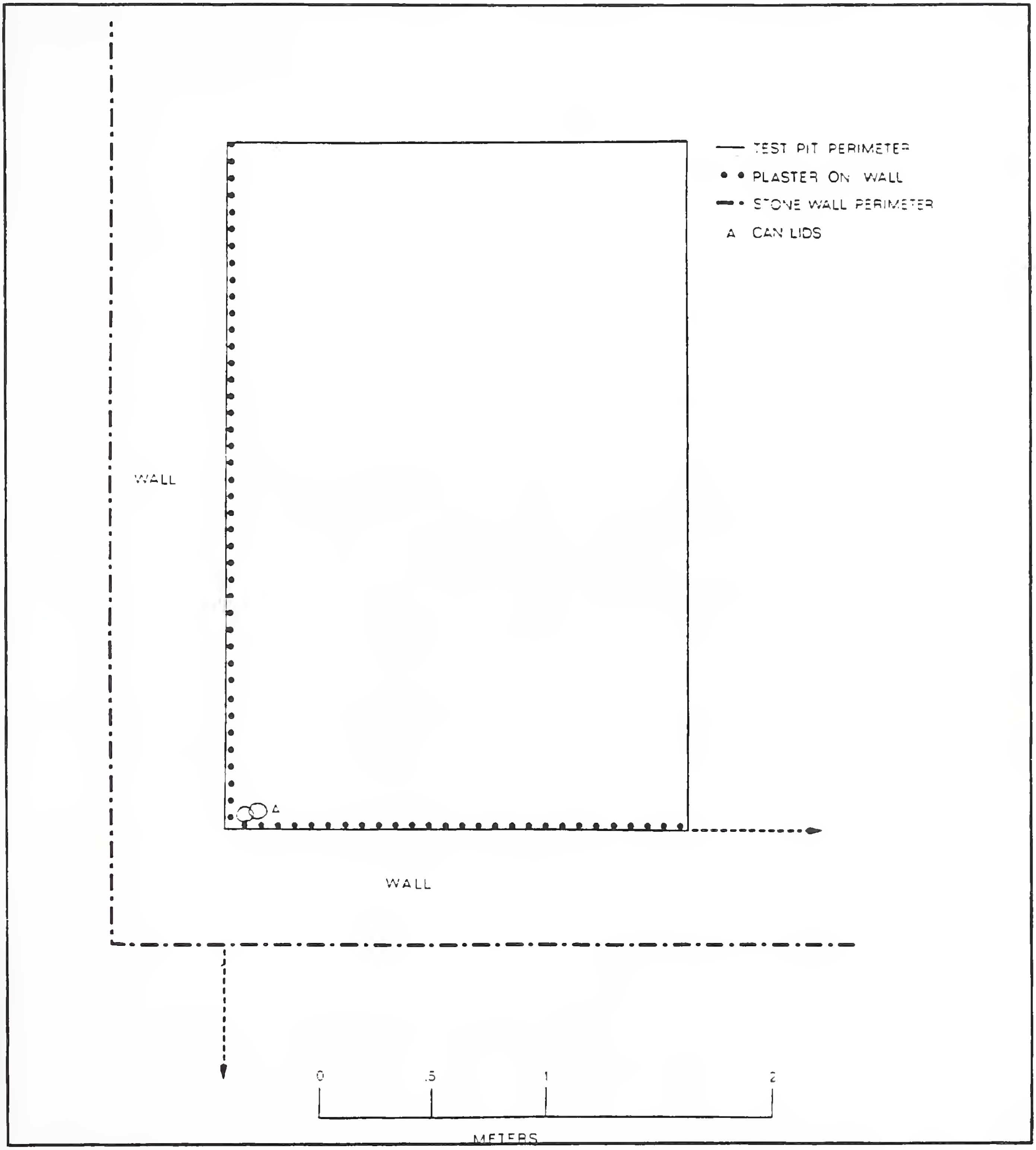
Test Pit 4 (Map A13-11 and Fig. A13-2): This test pit was originally established in the northeast corner of the northwest room, and measured three by three meters. It was expanded slightly on the north and east sides to investigate details of wall construction. Portions of the floor were found intact. The floor level was at a depth of 48 centimeters in the NW corner, 36 centimeters SW, 70 centimeters SE and 85 centimeters NE. Exterior wall was found on the north edge, interior wall on the east. The east wall was a plastered stone wall that was an extension of the west wall of TP2. The north wall revealed interesting construction details that merit further description.

The footing for the north wall consisted of, in some places, the river cobbles used elsewhere and, in other places, aligned adobe bricks. Overlying this footing were wood planks. The masonry wall was then added atop this footing.

The stratigraphy in this test pit was the same as that described elsewhere. Burned roof material was found in contact with the floor in the southeast corner. This matches similar material found in the northwest corner of TP2. Cultural material recovered included burned corn (kernels, cobs and an unhusked ear) from the area of the roof fall, window and bottle glass, china, nails and an unburned peach pit.

Test Pit 5 (Map A13-12): This test pit was established along the west wall, two meters north of the north edge of TP3. It measured three meters north-south and two meters east-west. Packed adobe floor was present throughout most of this unit, but was difficult to delineate in several places. The floor level measured 47 centimeters in the NW corner, 43 centimeters SW, 58 centimeters SE and 42 centimeters NE. Plastered stone walls were encountered along the north and south edges. These were both interior walls. The stratigraphy in this area was the same as elsewhere in the site. Only a few wood fragments from the roof were found.

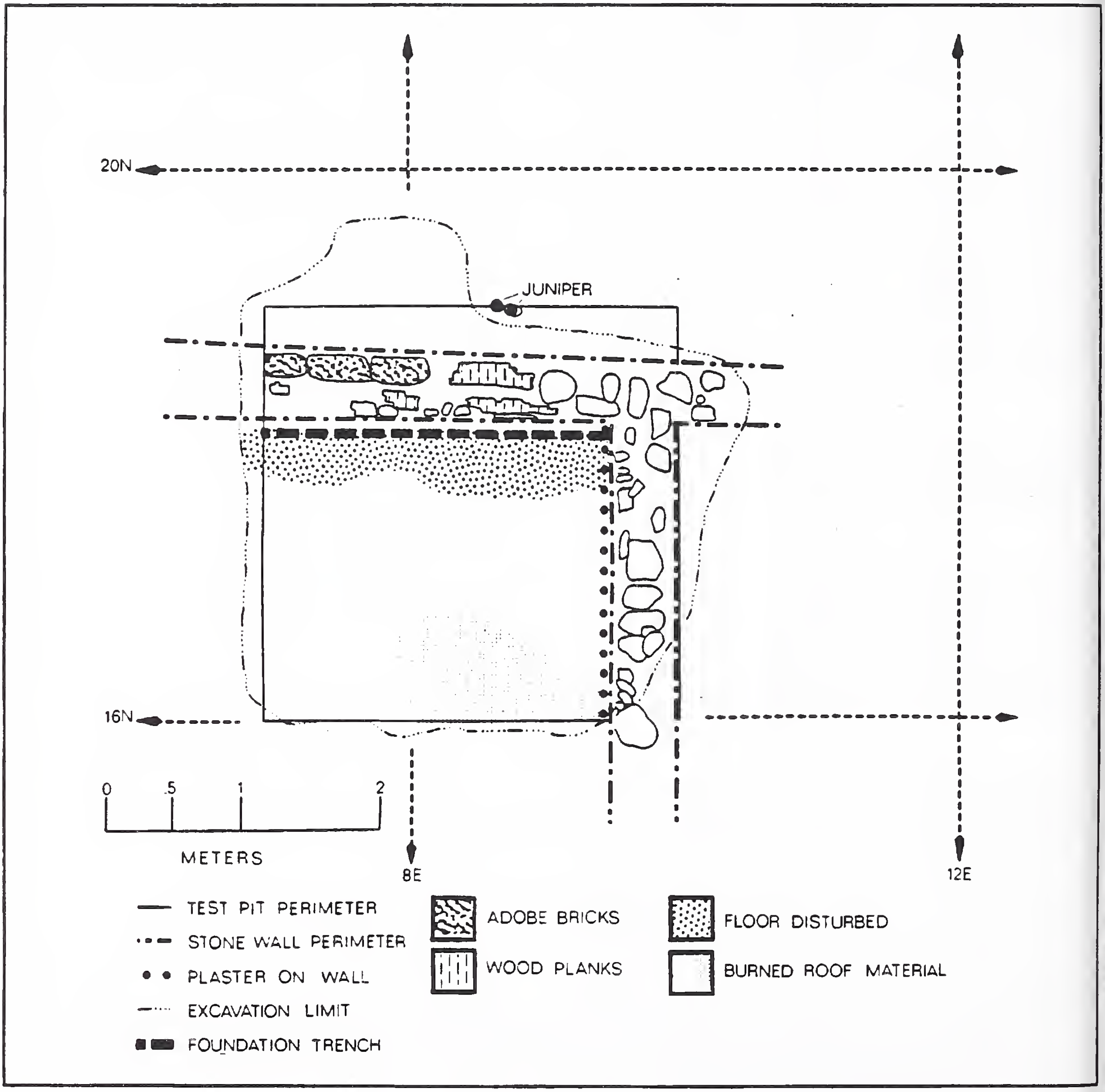
The lack of a stone wall on the west side of TP5 indicates that this area was probably enclosed by wood. A wooden



Map A13-10. Test Pit 3 uncovered a nearly sterile room of Site PL 3A.

beam was found at floor level oriented north-south along this west side. The only other cultural material in this unit were a nail and a section of metal wire.

The relative sterility of this area, the close spacing of the enclosing stone walls along the north and south edges, and the possible wood enclosure on the west side, combine to suggest that this was an entry/hallway. Tracing the walls uncovered in this test pit bears this out (Map A13-13).



Map A13-11. Test Pit 4 of Site PL 3A revealed a plastered stone wall on the east edge.

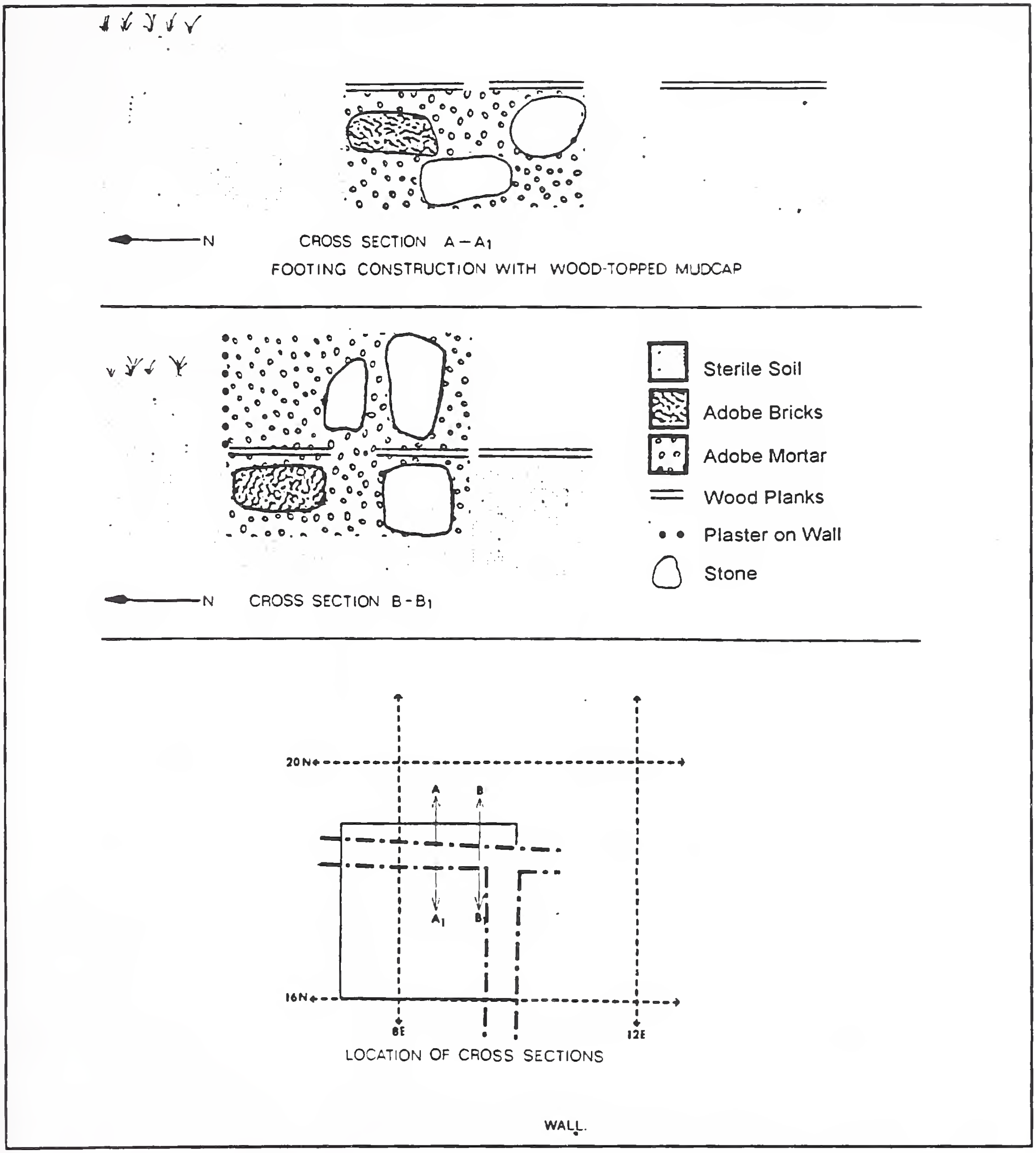
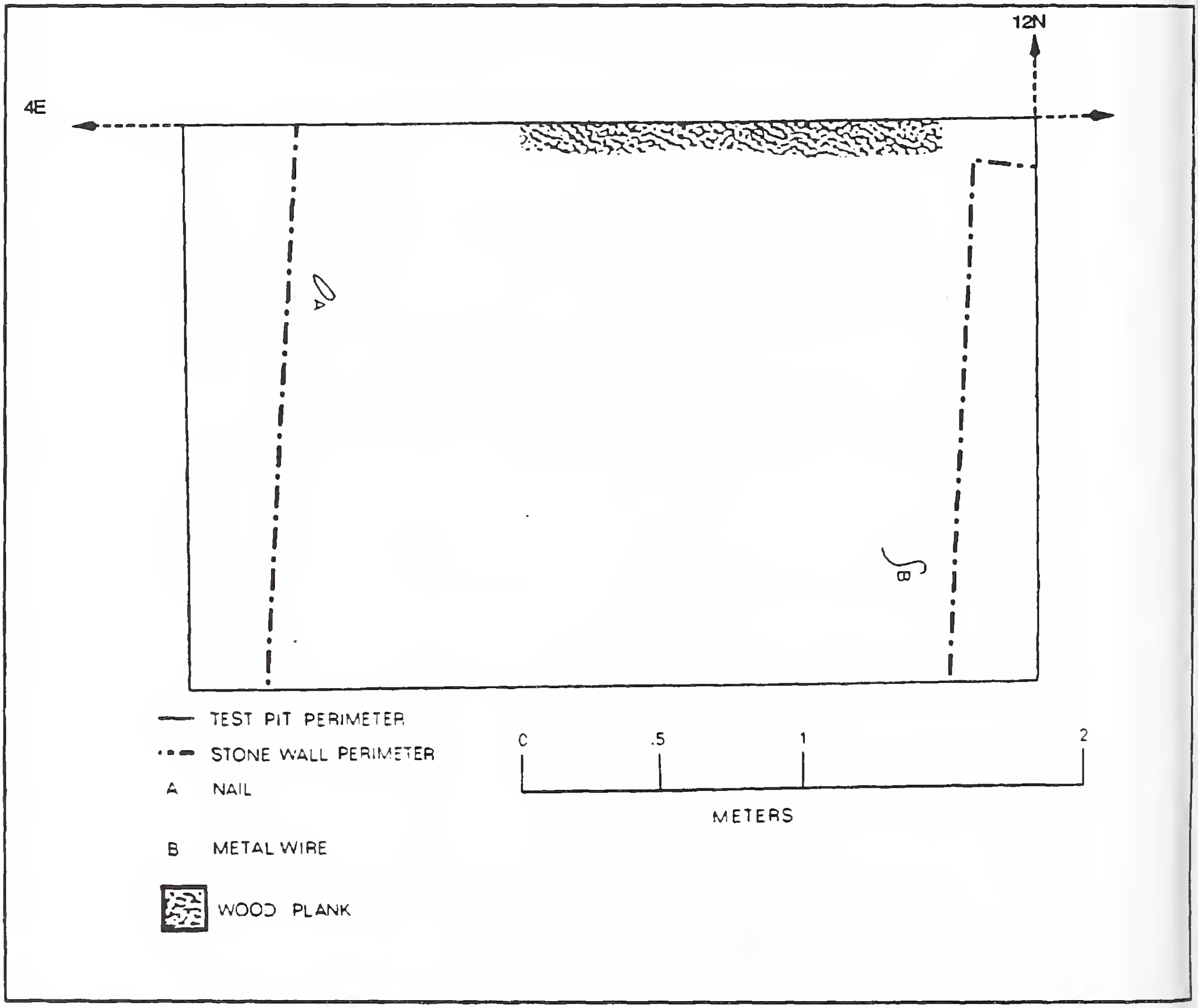


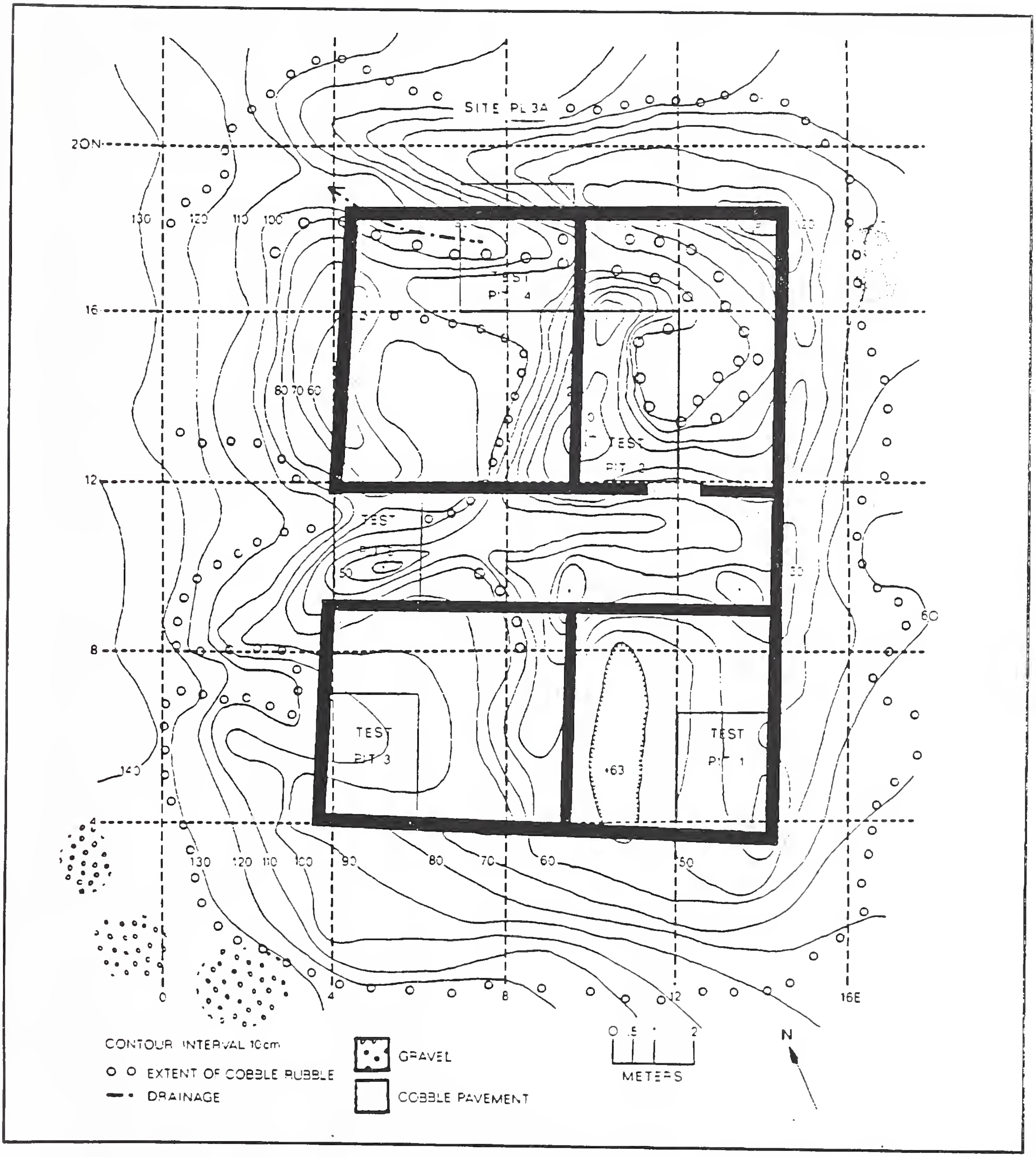
Figure A13-2. Cross sections of the north wall at Site PL 3A, Test Pit 4 (compare with Map A13-11).

Evaluation

Site PL3A appears to have served as a residential structure. The domestic trash within and surrounding the site, coupled with the layout of the rooms, substantiates this conclusion. As detailed in the main body of this chapter, the recovered artifacts indicate a date of occupation between the 1880s and the early 1920s, which accords with interview data obtained by Louanna Haecker. The structure consisted of four large rooms arranged off an east/west-oriented central hallway (Map A13-13). Although at least portions of the roof burned, the structure as a whole gives the impression of having been deliberately abandoned. Very little in the way of artifactual material was recovered. That which was found was not of substantial economic value.



Map A13-12. Test Pit 5 in Site PL 3A.



Map A13-13. Wall outlines indicate a 4-room structure at Site PL 3A.

Appendix 14-1 • Placitas Obsidian Hydration Dates

Site	FS No.	Material	Hydration Rind	Estimated Date
4A	10	3530	5.7	716 B.C.
4A	11	3500	0.0	NHV
4A	13	3523	0.0	NHV
4A	5	3500	4.9	1578 B.C.
8A	5	3530	4.0	655 A.D.
8A	7	3530	5.9	909 B.C.
8A	10	3530	3.9	720 A.D.
8A	4	3500	0.0	NHV
8A	6	3530	4.7	148 A.D.
9A	8	3523	0.0	NHV
9A	13	3520	5.9	1303 B.C.
9A	10	3530	7.1	2206 B.C.
9A	12	3530	6.1	1108 B.C.
11A	7	3530	7.0	2088 B.C.
14A	1	3500	6.2	3720 B.C
15A	1	3523	4.4	760 B.C.
15A	6	3523	6.3	3642 B.C
15A	9	3523	4.5	886 B.C.
16A	2	3523	0.0	NHV
22A	1	3525	6.0	1415 B.C.
23A	21	3500	5.8	3007 B.C.
23A	14	3500	0.0	NHV
23A	23	3523	4.8	1282 B.C.
23A	58	3520	7.6	3470 B.C.
23A	25	3520	0.0	NHV
23A	4	3525	6.3	1764 B.C.
23A	29	3525	5.5	872 B.C.
23A	30	3525	4.8	191 B.C.
23A	11	3530	5.6	622 B.C.
23A	16	3530	4.7	148 A.D.
28A	2	3500	6.2	3720 B.C.
30A	42	3500	4.1	510 B.C.
30A	44	3523	4.8	1282 B.C.
30A	41	3520	4.6	14 B.C.
30A	43	3525	5.2	569 B.C.
30A	6	3500	6.7	4677 B.C.
30A	9	3520	5.8	1192 B.C.
30A	35	3500	6.4	4093 B.C.
30A	46	3520	6.3	1764 B.C.
30A	52	3530	0.0	NHV
30A	62	3520	4.7	102 B.C.
30A	51	3520	7.2	2911 B.C.
30A	51	3520	0.0	NHV

Site	FS No.	Material	Hydration Rind	Estimated Date
30A	68	3520	7.3	3048 B.C.
30A	69	3520	7.5	3328 B.C.
30A	82	3520	6.6	2129 B.C.
30A	104	3520	6.8	2382 B.C.
30A	162	3500	7.9	7276 B.C.
30A	196	3500	7.9	7276 B.C.
30A	227	3500	4.6	1155 B.C.
30A	240	3500	6.2	3720 B.C.
30A	249	3500	7.0	5287 B.C.
30A	255	3520	0.0	NHV
30A	267	3500	7.2	5708 B.C.
30A	73	3500	6.8	4877 B.C.
30A	263	3520	6.3	1764 B.C.
30A	51	3520	0.0	NHV
30A	51	3520	7.9	3910 B.C.
32A	17	3530	6.3	1315 B.C.
32A	18	3500	4.8	1434 B.C.
32A	47	3520	4.0	473 B.C.
32A	57	3520	4.7	102 B.C.
32A	304	3520	4.2	319 B.C.
32A	338	3525	5.2	569 B.C.
33A	9	3523	0.0	NHV
33A	12	3525	4.6	14 B.C.
33A	14	3530	3.4	1024 A.D.
34A	44	3520	3.7	692 A.D.
34A	47	3520	3.3	956 A.D.
34A	43	3525	6.2	1646 B.C.
34A	45	3530	7.6	2817 B.C.
35A	19	3500	6.8	4877 B.C.
35A	21	3523	6.0	3119 B.C.
35A	17	3525	6.7	2255 B.C.
35A	1	3530	6.2	1211 B.C.
36A	1	3500	0.0	NHV
36A	13	3500	7.3	5923 B.C.
36A	21	3500	5.7	2837 B.C.
36A	22	3500	6.5	4285 B.C.
36A	25	3523	0.0	NHV
36A	5	3525	4.2	319 A.D
36A	3	3530	5.8	812 B.C.
36A	14	3530	4.9	11 B.C.
36A	15	3530	5.9	909 B.C.
36A	16	3530	4.7	148 A.D.
36A	19	3530	6.4	1420 B.C.
38A	49	3500	7.2	5708 B.C.
38A	3	3520	2.3	1485 A.D.
38A	46	3525	4.2	319 A.D.
38A	41	3530	2.0	1652 A.D.

Site	FS No.	Material	Hydration Rind	Estimated Date
38A	45	3530	6.4	1420 B.C.
39A	1	3523	7.4	5778 B.C.
39A	2	3523	5.7	1084 B.C.
39A	3	3525	4.4	156 A.D.
39A	5	3530	5.2	263 B.C.
41A	11	3520	5.3	668 B.C.
41A	2	3525	5.7	1084 B.C.
41A	4	3530	4.6	226 A.D.
41A	6	3530	5.4	439 B.C.
43A	3	3523	5.0	1559 B.C.
43A	2	3520	5.9	1303 B.C.
51A	3	3500	5.7	2837 B.C.
51A	12	3500	4.7	1293 B.C.
51A	11	3523	5.2	1849 B.C.
51A	8	3520	4.5	72 A.D.
51A	10	3525	5.2	569 B.C.
51A	21	3525	5.9	1303 B.C.
51A	14	3530	0.0	NHV
51A	20	3530	6.6	1636 B.C.
52A	9	3525	6.0	1415 B.C.
52A	11	3530	6.8	1859 B.C.
53A	2	3523	5.6	2461 B.C.
53A	1	3525	7.9	3910 B.C.
53A	4	3525	6.9	2512 B.C.
54A	6	3530	5.4	439 B.C.
55A	13	3520	0.0	NHV
55A	23	3525	0.0	NHV
55A	20	3525	5.4	769 B.C.
55A	12	3530	6.2	1211 B.C.
55A	15	3530	0.0	NHV
55A	27	3530	6.7	1747 B.C.
55A	30	3530	4.6	226 A.D.
56A	18	3523	5.5	2304 B.C.
56A	14	3520	0.0	NHV
56A	10	3525	6.0	1415 B.C.
56A	17	3525	6.3	1764 B.C.
56A	11	3530	0.0	NHV
56A	16	3530	6.0	1008 B.C.
58A	20	3500	4.4	888 B.C.
58A	11	3523	0.0	NHV
58A	15	3520	5.4	769 B.C.
58A	18	3525	3.5	828 A.D.
58A	23	3530	5.4	439 B.C.
58A	16	3530	4.1	587 A.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
58A	12	3530	6.1	1108 B.C.
58A	17	3530	4.6	226 A.D.
59A	3	3530	6.4	1420 B.C.
60A	4	3520	5.7	1084 B.C.
60A	5	3525	5.8	1192 B.C.
60A	9	3525	5.4	769 B.C.
60A	10	3525	0.0	NHV
61A	2	3523	5.2	1849 B.C.
61A	3	3523	0.0	NHV
62A	8	3500	4.2	633 B.C.
62A	9	3523	4.3	637 B.C.
62A	5	3520	5.9	1303 B.C.
62A	4	3525	4.8	191 B.C.
63A	31	3525	6.3	1764 B.C.
63A	32	3525	5.6	977 B.C.
63A	33	3523	5.6	2461 B.C.
63A	106	3523	5.7	2621 B.C.
63A	101	3520	0.0	NHV
63A	51	3525	0.0	NHV
63A	53	3525	5.2	569 B.C.
63A	58	3525	4.7	102 B.C.
63A	104	3525	5.7	1084 B.C.
63A	29	3530	6.8	1859 B.C.
63A	57	3530	0.0	NHV
63A	63	3530	7.4	2567 B.C.
63A	97	3530	6.8	1859 B.C.
63A	105	3530	6.5	1527 B.C.
63A	59	3530	4.8	69 A.D.
63A	64	3530	0.0	NHV
64A	10	3500	5.9	3181 B.C.
64A	8	3530	5.5	530 B.C.
69A	8	3525	6.5	2006 B.C.
70A	2	3530	5.7	716 B.C.
72A	2	3525	0.0	NHV
72A	7	3525	0.0	NHV
72A	3	3525	6.5	2006 B.C.
72A	4	3525	5.2	569 B.C.
72A	6	3525	7.3	3048 B.C.
72A	13	3525	6.7	2255 B.C.
73A	4	3523	6.7	4379 B.C.
73A	12	3525	6.4	1884 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
74A	78	3500	7.3	5923 B.C.
74A	84	3500	6.3	3905 B.C.
74A	95	3500	0.0	NHV
74A	79	3523	0.0	NHV
74A	69	3520	5.0	377 B.C.
74A	76	3525	5.2	569 B.C.
74A	80	3525	0.0	NHV
74A	11	3530	6.2	1211 B.C.
74A	12	3530	0.0	NHV
74A	71	3530	5.7	716 B.C.
74A	77	3530	4.7	148 A.D.
74A	92	3530	7.1	2206 B.C.
74A	93	3530	6.1	1108 B.C.
74A	98	3530	5.9	909 B.C.
77A	8	3525	4.6	14 B.C.
79A	1	3523	5.8	2784 B.C.
79A	4	3530	5.4	439 B.C.
80A	4	3523	0.0	NHV
80A	3	3525	5.9	1303 B.C.
80A	2	3535	5.8	1192 B.C.
83A	7	3523	5.9	2950 B.C.
83A	13	3523	5.8	2784 B.C.
83A	16	3523	0.0	NHV
83A	26	3523	5.5	2304 B.C.
83A	1	3525	5.4	769 B.C.
83A	8	3525	0.0	NHV
83A	17	3525	6.8	2382 B.C.
83A	18	3525	4.3	238 A.D.
83A	24	3530	0.0	NHV
86A	9	3500	5.8	3007 B.C.
86A	1	3520	6.8	2382 B.C.
86A	2	3525	5.8	1192 B.C.
86A	3	3525	6.7	2255 B.C.
87A	2	3523	5.3	1998 B.C.
87A	5	3520	6.0	1415 B.C.
87A	8	3520	6.5	2006 B.C.
88A	29	3530	6.5	1527 B.C.
88A	37	3530	6.0	1008 B.C.
88A	65	3530	5.9	909 B.C.
88A	42	3523	6.5	4005 B.C.
88A	49	3523	0.0	NHV
88A	46	3520	5.5	872 B.C.
88A	68	3520	7.0	2643 B.C.
88A	47	3525	6.9	2512 B.C.
88A	48	3525	0.0	NHV
88A	50	3525	6.7	2255 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
88A	60	3525	6.4	1884 B.C.
88A	53	3530	0.0	NHV
88A	54	3530	0.0	NHV
88A	58	3530	0.0	NHV
89A	9	3500	6.4	4093 B.C.
89A	10	3520	6.2	1646 B.C.
89A	12	3520	6.3	1764 B.C.
89A	7	3523	6.0	3119 B.C.
89A	5	3525	0.0	NHV
90A	2	3523	6.4	3822 B.C.
90A	3	3530	0.0	NHV
91A	2	3500	5.4	2342 B.C.
91A	5	3525	5.7	1084 B.C.
91A	1	3500	6.4	4093 B.C.
92A	5	3525	4.7	102 B.C.
92A	6	3525	4.6	14 B.C.
93A	10	3523	6.9	4765 B.C.
93A	6	3525	6.8	2382 B.C.
93A	11	3525	7.0	2643 B.C.
94A	4	3520	6.5	2006 B.C.
95A	6	3525	4.8	191 B.C.
96A	7	3523	0.0	NHV
96A	2	3520	6.4	1884 B.C.
96A	8	3525	0.0	NHV
96A	6	3525	7.1	2776 B.C.
97A	3	3523	0.0	NHV
97A	11	3523	7.1	5162 B.C.
97A	8	3520	4.7	102 B.C.
97A	4	3520	6.6	2129 B.C.
97A	5	3523	6.8	4570 B.C.
97A	6	3525	0.0	NHV
97A	9	3525	7.0	2643 B.C.
97A	12	3525	6.5	2006 B.C.
97A	20	3530	6.8	1859 B.C.
98A	5	3525	5.8	1192 B.C.
98A	10	3525	0.0	NHV
98A	6	3530	5.9	909 B.C.
98A	9	3530	6.5	1527 B.C.
99A	4	3530	6.8	1859 B.C.
102A	16	3523	6.8	4570 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
102A	12	3520	6.0	1415 B.C.
102A	15	3525	7.0	2643 B.C.
102A	10	3530	5.6	622 B.C.
102A	14	3530	0.0	NHV
103A	7	3523	6.1	3290 B.C.
103A	3	3525	6.5	2006 B.C.
103A	2	3525	0.0	NHV
103A	1	3530	6.6	1636 B.C.
104A	4	3530	4.1	587 B.C.
105A	7	3523	0.0	NHV
105A	11	3525	4.2	319 A.D.
105A	8	3530	5.3	350 B.C.
106A	9	3523	5.2	1849 B.C.
107A	17	3500	6.7	4677 B.C.
107A	11	3523	6.9	4765 B.C.
107A	12	3525	6.4	1884 B.C.
108A	1	3523	6.9	4765 B.C.
108A	3	3523	6.8	4570 B.C.
108A	7	3520	6.4	1884 B.C.
108A	5	3525	6.3	1764 B.C.
108A	2	3525	6.9	2512 B.C.
109A	6	3520	6.5	2006 B.C.
109A	1	3530	6.8	1859 B.C.
111A	10	3523	5.2	1849 B.C.
111A	11	3500	5.3	2184 B.C.
112A	2	3523	5.8	2784 B.C.
112A	12	3523	5.6	2461 B.C.
112A	6	3520	5.5	872 B.C.
112A	9	3525	5.5	872 B.C.
113A	12	3523	6.1	3290 B.C.
113A	11	3520	6.8	2382 B.C.
113A	9	3530	6.6	1636 B.C.
114A	1	3523	6.1	3290 B.C.
114A	3	3523	6.5	4005 B.C.
114A	2	3520	6.4	1884 B.C.
114A	6	3520	6.3	1764 B.C.
115A	16	3500	6.8	4877 B.C.
115A	12	3523	6.1	3290 B.C.
115A	23	3520	6.0	1415 B.C.
115A	14	3525	6.8	2382 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
115A	20	3530	6.6	1636 B.C.
115A	11	3530	6.3	1315 B.C.
115A	10	3530	6.7	1747 B.C.
116A	1	3520	5.3	668 B.C.
116A	2	3520	6.8	2382 B.C.
116A	3	3530	6.9	1973 B.C.
117A	1	3530	8.3	3742 B.C.
118A	2	3523	7.2	5364 B.C.
118A	5	3525	7.5	3328 B.C.
119A	2	3500	4.8	1434 B.C.
119A	1	3523	5.9	2950 B.C.
119A	4	3523	0.0	NHV
119A	6	3523	5.0	1559 B.C.
119A	8	3523	6.4	3822 B.C.
119A	9	3523	6.0	3119 B.C.
119A	11	3523	5.6	2461 B.C.
119A	15	3520	5.3	668 B.C.
119A	21	3525	5.6	977 B.C.
119A	3	3530	5.6	622 B.C.
120A	1	3520	5.0	377 B.C.
120A	3	3530	0.0	NHV
122A	9	3525	6.8	2382 B.C.
122A	8	3530	6.4	1420 B.C.
123A	3	3525	5.7	1084 B.C.
123A	4	3530	5.8	812 B.C.
125A	4	3500	6.0	3357 B.C.
125A	5	3525	5.6	977 B.C.
126A	2	3530	5.6	622 B.C.
127A	7	3500	5.8	3007 B.C.
127A	8	3500	6.2	3720 B.C.
127A	4	3530	5.9	909 B.C.
128A	1	3523	4.8	1282 B.C.
128A	4	3530	4.6	226 A.D.
1B	15	3500	6.7	4677 B.C.
1B	22	3500	6.8	4877 B.C.
1B	14	3523	6.6	4191 B.C.
1B	10	3520	6.9	2512 B.C.
1B	21	3525	0.0	NHV
1B	20	3525	6.6	2129 B.C.
1B	8	3530	7.4	2567 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
2B	24	3500	7.2	5708 B.C.
2B	36	3500	6.1	3537 B.C.
2B	58	3500	7.3	5923 B.C.
2B	67	3500	0.0	NHV
2B	19	3520	6.5	2006 B.C.
2B	9	3525	6.9	2512 B.C.
2B	41	3525	7.2	2911 B.C.
2B	10	3525	5.5	872 B.C.
2B	18	3525	6.8	2382 B.C.
2B	15	3530	7.1	2206 B.C.
2B	28	3530	6.9	1973 B.C.
2B	35	3530	7.6	2817 B.C.
2B	38	3530	6.9	1973 B.C.
2B	47	3530	5.9	909 B.C.
2B	27	3523	6.0	3119 B.C.
3B	9	3500	6.3	3905 B.C.
3B	24	3523	6.0	3119 B.C.
3B	13	3520	6.9	2512 B.C.
3B	16	3520	0.0	NHV
3B	6	3525	6.0	1415 B.C.
3B	14	3525	6.6	2129 B.C.
3B	11	3525	6.8	2382 B.C.
3B	31	3525	0.0	NHV
3B	12	3530	5.5	530 B.C.
3B	26	3530	0.0	NHV
4B	10	3500	6.7	4677 B.C.
4B	1	3520	6.1	1530 B.C.
4B	9	3530	6.8	1859 B.C.
4B	8	3523	7.4	5778 B.C.
5B	55	3500	7.3	5923 B.C.
5B	57	3520	7.6	3470 B.C.
5B	58	3525	6.9	2512 B.C.
5B	60	3525	0.0	NHV
5B	63	3525	6.3	1764 B.C.
5B	1	3525	7.6	3470 B.C.
5B	54	3530	7.4	2567 B.C.
5B	62	3523	7.2	5364 B.C.
5B	13	3530	0.0	NHV
7B	23	3500	6.5	4285 B.C.
7B	24	3500	0.0	NHV
7B	22	3520	5.9	1303 B.C
7B	17	3530	7.0	2088 B.C.
7B	19	3523	7.1	5162 B.C.
8B	18	3500	5.7	2837 B.C.
8B	4	3520	7.2	2911 B.C.
8B	17	3525	5.9	1303 B.C.
8B	7	3530	7.4	2567 B.C.
8B	16	3523	6.6	4191 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
8B	11	3530	5.6	622 B.C.
9B	53	3500	5.4	2342 B.C.
9B	63	3500	5.6	2669 B.C.
9B	84	3500	6.3	3905 B.C.
9B	60	3523	6.0	3119 B.C.
9B	44	3523	5.7	2621 B.C.
9B	65	3520	5.7	1084 B.C.
9B	66	3520	6.7	2255 B.C.
9B	67	3520	6.0	1415 B.C.
9B	51	3525	5.9	1303 B.C.
9B	52	3525	0.0	NHV
9B	57	3525	5.7	1084 B.C.
9B	47	3530	5.6	622 B.C.
9B	54	3530	5.7	716 B.C.
9B	58	3530	6.1	1108 B.C.
9B	59	3530	5.5	530 B.C.
10B	9	3500	5.4	2342 B.C.
10B	15	3520	5.8	1192 B.C.
10B	1	3530	5.5	530 B.C.
10B	8	3530	5.4	439 B.C.
10B	10	3530	5.9	909 B.C.
10B	16	3530	0.0	NHV
10B	17	3530	5.6	622 B.C.
11B	3	3525	6.2	1646 B.C.
11B	5	3530	5.4	439 B.C.
12B	5	3530	4.8	69 A.D.
12B	7	3530	5.2	263 B.C.
12B	8	3530	0.0	NHV
12B	9	3530	4.9	11 B.C.
12B	12	3530	5.0	94 B.C.
15B	13	3530	6.6	1636 B.C.
16B	3	3500	5.9	3181 B.C.
17B	4	3530	5.2	263 B.C.
17B	7	3530	5.0	94 B.C.
23B	3	3525	6.1	1530 B.C.
25B	1	3530	6.2	1211 B.C.
28B	4	3530	6.0	1008 B.C.
32B	16	3500	6.6	4479 B.C.
35B	4	3500	6.6	4479 B.C.
35B	8	3525	6.9	2512 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
36B	6	3523	6.8	4570 B.C.
36B	7	3520	0.0	NHV
40B	17	3530	5.3	350 B.C.
43B	132	3525	5.8	1192 B.C.
43B	133	3530	5.7	716 B.C.
44B	20	3530	5.2	263 B.C.
45B	69	3520	5.6	977 B.C.
45B	68	3525	6.0	1415 B.C.
45B	70	3530	5.4	439 B.C.
48B	44	3525	6.1	1530 B.C.
48B	43	3525	5.9	1303 B.C.
49B	16	3525	6.7	2255 B.C.
50B	21	3500	6.1	3537 B.C.
50B	20	3525	5.7	1084 B.C.
51B	17	3500	6.0	3357 B.C.
51B	15	3530	6.2	1211 B.C.
52B	7	3530	6.3	1315 B.C.
55B	54	3530	6.2	1211 B.C.
55B	55	3530	5.8	812 B.C.
55B	58	3530	5.9	909 B.C.
55B	62	3530	6.1	1108 B.C.
57B	12	3500	6.6	4479 B.C.
57B	14	3500	5.4	2342 B.C.
57B	101	3520	6.5	2006 B.C.
57B	102	3525	6.0	1415 B.C.
57B	103	3525	0.0	NHV
57B	10	3530	5.3	350 B.C.
57B	11	3530	5.6	622 B.C.
58B	10	3525	6.2	1646 B.C.
58B	6	3530	6.4	1420 B.C.
58B	7	3530	6.1	1108 B.C.
59B	3	3530	6.4	1420 B.C.
60B	5	3525	6.2	1646 B.C.
60B	4	3530	6.0	1008 B.C.
60B	6	3530	6.3	1315 B.C.
61B	138	3530	6.5	1527 B.C.

Site	FS No.	Material	Hydration Rind	Estimated Date
66B	19	3525	6.2	1646 B.C.
67B	8	3500	5.5	2504 B.C.
67B	10	3500	5.2	2028 B.C.
67B	9	3520	6.0	1415 B.C.
67B	15	3520	6.2	1646 B.C.
67B	20	3525	5.8	1192 B.C.
67B	3	3530	6.4	1420 B.C.
67B	4	3530	5.1	178 B.C.
67B	5	3530	6.2	1211 B.C.
67B	6	3530	0.0	NHV
67B	7	3530	6.0	1008 B.C.
69B	22	3530	5.5	530 B.C.
70B	33	3525	6.4	1884 B.C.
72B	21	3530	6.0	1008 B.C.
85B	1	3530	5.4	439 B.C.
89B	2	3525	5.3	668 B.C.
89B	1	3530	5.0	94 B.C.
89B	3	3530	0.0	NHV
90B	1	3500	5.1	1875 B.C.
90B	16	3500	4.4	888 B.C.
90B	9	3523	5.2	1849 B.C.
90B	5	3520	5.1	472 B.C.
90B	2	3525	0.0	NHV
90B	6	3530	5.2	263 B.C.
90B	12	3530	5.3	350 B.C.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

PB96-155197

1.	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	September 1995	Final - 1981 to 1990

4. TITLE AND SUBTITLE
Archeology of the Albuquerque Sector of the Elena Gallegos Project

5. FUNDING NUMBERS
PR

6. AUTHOR(S)
Joseph A. Tainter, editor

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
USDA Forest Service
Southwestern Region
517 Gold Ave. SW
Albuquerque, NM 87102

8. PERFORMING ORGANIZATION REPORT NUMBER
Heritage Resources Management Report 14

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Same

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
N/A

11. SUPPLEMENTARY NOTES
None

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This report contains 14 chapters reporting archeological investigations conducted on public lands as part of the Forest Service Elena Gallegos Land Exchange Project. The chapters cover testing and excavation of sites, ethnobotanical analyses, pollen analyses, faunal analyses, lithic analysis, ceramic analysis, historic sites, and project synthesis.

14. SUBJECT TERMS
Archeology; history; cultural resource management

15. NUMBER OF PAGES
459

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std Z39-18
298-102

GENERAL INSTRUCTIONS FOR COMPLETING SF 298

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filling in each block of the form follow. It is important to *stay within the lines* to meet *optical scanning requirements*.

Block 1. Agency Use Only (Leave blank).

Block 2. Report Date. Full publication date including day, month, and year, if available (e.g. 1 Jan 88). Must cite at least the year.

Block 3. Type of Report and Dates Covered. State whether report is interim, final, etc. If applicable, enter inclusive report dates (e.g. 10 Jun 87 - 30 Jun 88).

Block 4. Title and Subtitle. A title is taken from the part of the report that provides the most meaningful and complete information. When a report is prepared in more than one volume, repeat the primary title, add volume number, and include subtitle for the specific volume. On classified documents enter the title classification in parentheses.

Block 5. Funding Numbers. To include contract and grant numbers; may include program element number(s), project number(s), task number(s), and work unit number(s). Use the following labels:

C	- Contract	PR	- Project
G	- Grant	TA	- Task
PE	- Program Element	WU	- Work Unit Accession No.

Block 6. Author(s). Name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. If editor or compiler, this should follow the name(s).

Block 7. Performing Organization Name(s) and Address(es). Self-explanatory.

Block 8. Performing Organization Report Number. Enter the unique alphanumeric report number(s) assigned by the organization performing the report.

Block 9. Sponsoring/Monitoring Agency Name(s) and Address(es). Self-explanatory.

Block 10. Sponsoring/Monitoring Agency Report Number. *(If known)*

Block 11. Supplementary Notes. Enter information not included elsewhere such as: Prepared in cooperation with...; Trans. of...; To be published in.... When a report is revised, include a statement whether the new report supersedes or supplements the older report.

Block 12a. Distribution/Availability Statement. Denotes public availability or limitations. Cite any availability to the public. Enter additional limitations or special markings in all capitals (e.g. NOFORN, REL, ITAR).

DOD - See DoDD 5230.24, "Distribution Statements on Technical Documents."
DOE - See authorities.
NASA - See Handbook NHB 2200.2.
NTIS - Leave blank.

Block 12b. Distribution Code.

DOD - Leave blank.
DOE - Enter DOE distribution categories from the Standard Distribution for Unclassified Scientific and Technical Reports.
NASA - Leave blank.
NTIS - Leave blank.

Block 13. Abstract. Include a brief *(Maximum 200 words)* factual summary of the most significant information contained in the report.

Block 14. Subject Terms. Keywords or phrases identifying major subjects in the report.

Block 15. Number of Pages. Enter the total number of pages.

Block 16. Price Code. Enter appropriate price code *(NTIS only)*.

Blocks 17. - 19. Security Classifications. Self-explanatory. Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., UNCLASSIFIED). If form contains classified information, stamp classification on the top and bottom of the page.

Block 20. Limitation of Abstract. This block must be completed to assign a limitation to the abstract. Enter either UL (unlimited) or SAR (same as report). An entry in this block is necessary if the abstract is to be limited. If blank, the abstract is assumed to be unlimited.

*U.S.GPO:1993-0-358-779

U.S. DEPARTMENT OF COMMERCE
Technology Administration
National Technical Information Service
Springfield, VA 22161 (703) 605-6000