Pajarito Plateau
Archaeological Surveys
and Excavations, II

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico, 87545

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Cover
Pictured on the cover is a part of LA 16803. This is an excellent example of a type of trail hammered into the tuff by pre-Columbian Indians.
Pajarito Plateau
Archaeological Surveys
and Excavations, II

Charlie R. Steen
Locations of sites added to Los Alamos survey since the 1977 report was issued.
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PAJARITO PLATEAU
ARCHAEOLOGICAL SURVEYS AND EXCAVATIONS, II
by
Charlie R. Steen

ABSTRACT

Los Alamos National Laboratory continues its archaeological program of data gathering and salvage excavations. Sites recently added to the archaeological survey are described, as well as the results of five excavations. Among the more interesting and important discoveries are (1) the apparently well-established local use of anhydrous lime, and (2) a late pre-Columbian use of earlier house sites and middens for garden plots. Evidence indicates that the local pueblan population was the result of an expansion of upper Rio Grande peoples, not an influx of migrants.

INTRODUCTION

Since 1950 Los Alamos National Laboratory (hereafter Los Alamos) has undertaken archaeological surveys made necessary excavations in advance of construction of its facilities. These have provided an inventory of historic resources of that portion of the Pajarito Plateau which Los Alamos is situated, as well as a good foundation for continued study of human activities here. Results of other studies have been reported in several publications: Worman, 1959 and 1967; Steen, 1977; and Worman and Steen, 1978. An outline of work done after 1950 is given in the 1977 report.

Search for archaeological sites is a never ending task. Any early habitation remains are large enough to be easily seen by the surveyor, but many other spots used ancient man, such as shrines, small horticultural as, or other places of limited use, can easily be missed in a survey. So it is necessary to continue to look for such remains of pre-Columbian man, particularly in a fairly large area such as Los Alamos where activities threaten to destroy sites.

Los Alamos functions continue to expand and there are new developments that must be housed. Even the most new construction can be placed to avoid ancient remains, every now and then this is impractical. An excavation is then necessary to record the information stored within the site that will be destroyed.

This report follows, to some extent, the format of the 1977 report on surveys and excavations. The first section will be devoted to sites that have been located since that report went to press. Following is a section to describe excavations made since 1976. The final portion contains a series of discussions of Pajaritan archaeology. Enough work has been done since 1950 and enough data have been gathered so that some aspects of early life on the Plateau emerge in a rather clear pattern.

There must be a caveat here. Archaeology is not a science, even though many scientific methods are used to solve its problems. Archaeology involves study and interpretation of the material remains of bygone peoples. In the case of pre-Columbian relics in the southwestern United States, we must deal with artifacts of a nonliterate population and in some instances the artifacts are not represented in modern assemblages of tools and structures. However, we are fortunate here in that we do have modern Pueblo Indians who are directly descended from the old people and whose arsenal of artifacts and customs ease the way for us to interpret the things we find in the old settlements.

It is the interpretation that frequently causes difficulty. The person who digs a site and then sits down to write
about it must interpret the finds mostly in the light of his own knowledge and experience (bolstered by findings and interpretations of others). It is because of this individualistic approach to the subject that one can but rarely find two archaeologists who are in complete agreement on a major aspect of this field of study. It is also this that has led at least one man to call the subject arque-ology.

A serious error lies in the 1977 survey report and it is perpetrated in this report. I have referred frequently to the Pajarito Plateau when writing about the restricted portion of the Plateau that is occupied by Los Alamos. This has caused some confusion and I take full blame. So, unless a broader scope is clearly indicated, in this report Pajarito Plateau means that portion of the uplands from Bayo Canyon to Ancho Canyon.

THE SURVEY

Thirty-seven additions were made to the inventory of historic sites during the past two years. Most of these were pre-Columbian in age. During discussions with staff members of the Museum of New Mexico it was decided that it would be desirable to add late 19th/early 20th century ranch sites to the state wide archaeological inventory, so five log cabin locations are included in this list. The frontispiece shows the location of the new sites and basic information for each is given in Table I.

Once again it should be pointed out that the prefix LA does not mean Los Alamos, but is the designation given by the Laboratory of Anthropology of the Museum of New Mexico.

Most of the Indian house sites were found after the severe June 1977 forest fire—La Mesa fire. Hundreds of acres of Los Alamos lands were burned over during that blaze and I later searched the area to learn whether the intense heat had damaged ruins. The answer to the question was no. The unconstrained heat of the fire had passed into the air and there was no apparent damage to remains that laid below the duff/humus zone of the forest floor.

Throughout the ponderosa pine forest there had been dense stands of ponderosa saplings and of scrub Gambel oak. A number of sites had been well hidden in these stands; this was particularly true within TA-49. In another area south of the K Site road and TA-37 there had been extensive burning, but also there were, and are, large glades in the forest. Near the edges of the glades are several ruins. Although the fire led me into the burn, the ruins at the edge of the grassed areas would have been visible at any time. For an unknown reason I had not surveyed the mesa south of the K Site road. In the section on agriculture is a short discussion on the nature and age of glades on the Pajarito Plateau.

A. House Ruins

Little is to be said about the house blocks that were found. They fall into the general pattern of small ruins on the Plateau and consist most frequently of one or two rows of rooms (up to a total of 10 or 12) with the long axis running north-south. The few one-room structures found must have been field houses so that one or more persons could camp near the fields to cultivate or harvest crops.

Perhaps the most interesting of the newly found house blocks is LA 15855. It consists of a block of six rooms (two rows of three rooms each), and a few meters north of it, another double row of rooms (seven in each row). North of the latter group of rooms is a kiva with a masonry-lined excavation. The ruin was excavated years ago and I have been unable to learn who did the work; presumably no report was ever published. To judge by the condition of the piles of dirt near the ruin, the site was dug in the 1930s.

Eleven of the house groups had cavate rooms in the cliffs nearby. Cavate rooms on the Pajarito Plateau fall into two categories—storage and ceremonial rooms. I know of none of the rooms that can be termed a dwelling. I gave arguments for terming most of these rooms "ceremonial" in my 1977 report (pages 14 through 17). Cavate ceremonial and storage rooms are almost always found in conjunction with dwelling and other storage rooms built of masonry against the bases of cliffs.

One small, well preserved, cavate room (LA 16801) is of a type that might be termed a shrine or place of meditation for a single person (Fig. 1). Only a few of these are to be found. They are dissociated from any dwelling and are small symmetrical rooms, which measure about a meter in diameter and are a scant meter in height. These rooms are blackened with the dense resinous smoke that distinguishes the cave kivas, but not one of those seen has rock art on the walls. Firepits, near the entrances, are small.

B. Shrines

Six sites that should be classified as shrines were added to the inventory. Three of these are of the type termed "Box" or "Open Box" in the 1977 survey report. Two other shrine sites are quite distinctive.
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<th>Site Number</th>
<th>Location</th>
<th>Description</th>
<th>Pottery</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA 13557</td>
<td>N. side Ancho Canyon</td>
<td>12 cavate rooms, 2 with rock art at top of talus. Foundation of masonry rooms, some 3 stories high.</td>
<td>Glaze Paint Wares</td>
</tr>
<tr>
<td>LA 14869</td>
<td>0.3 km S of Phermex Facility</td>
<td>Shrine. Oval of 4 concentric rows of upright slabs (Fig. 3).</td>
<td>Only Corrugated seen</td>
</tr>
<tr>
<td>LA 14870</td>
<td>S side Los Alamos Canyon</td>
<td>Alignments of basalt boulders. Possible garden plots. Also a probable 1 room structure.</td>
<td></td>
</tr>
<tr>
<td>LA 14871</td>
<td>S side Los Alamos Canyon</td>
<td>Shrine. Vertical Tuff Post with circular floor of cobble stones (Fig. 2).</td>
<td></td>
</tr>
<tr>
<td>LA 14872</td>
<td>South of Pajarito Road at site of water tank for TA 55</td>
<td>Log cabin site. Excavated in August 1977.</td>
<td>None seen</td>
</tr>
<tr>
<td>LA 14873</td>
<td>N side Los Alamos Canyon</td>
<td>8 Cavate rooms plus undetermined number of Talus Houses. Petroglyphs on isolated boulder.</td>
<td></td>
</tr>
<tr>
<td>LA 14875</td>
<td>N side Sandia Canyon</td>
<td>7 cavate rooms and evidence of about 12 surface rooms 2 stories high. Outstanding rock art damaged by recent camping.</td>
<td>None seen</td>
</tr>
<tr>
<td>LA 14876</td>
<td>N side Sandia Canyon</td>
<td>20+ cavate rooms. Talus houses 3 stories high. Much of site destroyed by rock falls.</td>
<td>Only corrugated seen</td>
</tr>
<tr>
<td>LA 15116</td>
<td>South terrace Rendija Creek</td>
<td>1 room structure of basalt boulders.</td>
<td>None seen</td>
</tr>
<tr>
<td>LA 15258</td>
<td>N side Potrillo Canyon</td>
<td>3 cavate kivas, 2 storage rooms. Poorly preserved rock art. Some surface rooms and check dams on slope below.</td>
<td>Wiyo B/W</td>
</tr>
<tr>
<td>LA 15259</td>
<td>N side Potrillo Canyon</td>
<td>Numerous check dams and a rough wall in front of small cave-like hole — a probable shelter for a field watcher (Fig. 4).</td>
<td>Abiquiu B/GR</td>
</tr>
<tr>
<td>LA 15854</td>
<td>Near gate to TA 37</td>
<td>5 or 6 room house block.</td>
<td>Santa Fe B/W</td>
</tr>
<tr>
<td>LA 15855</td>
<td>On edge of glade S of TA 37</td>
<td>2 ruins and a kiva excavated years ago. No known record of dig.</td>
<td>Wiyo B/W</td>
</tr>
<tr>
<td>Site Number</td>
<td>Location</td>
<td>Description</td>
<td>Pottery</td>
</tr>
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</tr>
<tr>
<td>LA 15856</td>
<td>Near edge of water Canyon SW of TA 49</td>
<td>A single room and a block of 3 rooms.</td>
<td>Wiyo B/W</td>
</tr>
<tr>
<td>LA 15857</td>
<td>In glade S of K Site Road</td>
<td>Double row of rooms; 8 or 10 in all.</td>
<td>Wiyo B/W</td>
</tr>
<tr>
<td>LA 15858</td>
<td>Edge of drainage channel between buildings of TA 16</td>
<td>A 2 room masonry structure.</td>
<td>Wiyo B/W</td>
</tr>
<tr>
<td>LA 15859</td>
<td>Edge of glade S of K Site road</td>
<td>2 rooms.</td>
<td>Wiyo B/W</td>
</tr>
<tr>
<td>LA 15860</td>
<td>TA 49. Near rim of Water Canyon and W of fire break.</td>
<td>Two 1 or 2 room structures. Badly damaged years ago.</td>
<td>Wiyo B/W</td>
</tr>
<tr>
<td>LA 15861</td>
<td>TA 49. 120 m W of fire break</td>
<td>2 rows of rooms. 10 or 12 rooms total.</td>
<td>Santa Fe B/W</td>
</tr>
<tr>
<td>LA 15862</td>
<td>TA 49. West of firebreak and 100 m S of Water Canyon</td>
<td>Box shrine.</td>
<td>San Lazaro Glaze Polychrome</td>
</tr>
<tr>
<td>LA 15863</td>
<td>TA 49. At crest of mesa N of gate into area</td>
<td>Single room.</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 15864</td>
<td>150 m NW of junction of TA 49 road and firebreak</td>
<td>Single room.</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 15865</td>
<td>Near W edge of TA 49</td>
<td>A cluster of 5 small ruins. 2 are possibly shrines.</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 15866</td>
<td>TA 49 W of fire break</td>
<td>8–10 room house, partly destroyed about 1960. Excavated in 1977. South of ruin is a log cabin site (Fig. 6).</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 16798</td>
<td>N side Los Alamos Canyon</td>
<td>5 groups of caveate rooms plus evidence of talus rooms. Rock art. Much damage by rock falls.</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 16799</td>
<td>N side Mortandad Canyon</td>
<td>2 groups of caveate rooms plus a single room. Some masonry houses. Rock art.</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 16800</td>
<td>In Hwy 4 right of way at the TA 49 gate</td>
<td>8 rooms in a double row</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 16807</td>
<td>Head of Cañada del Buey, Near Uhtrex building</td>
<td>West preserved small caveate room (Fig. 1)</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 16808</td>
<td>Pajarito Canyon, west of TA 18 fence</td>
<td>8 caveate rooms some masonry walls in front.</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 16807</td>
<td>North rim Mortandad Canyon</td>
<td>Deeply worn trail, but no ruins nearby (Fig. 5).</td>
<td>Bandelier B/GK</td>
</tr>
<tr>
<td>LA 16604</td>
<td>North rim Canyon del Valle W of TA 14</td>
<td>2 small panels of rock art. Badly weathered.</td>
<td>Bandelier B/GK</td>
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TABLE I (cont)

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<td>LA 16805</td>
<td>Crest of the mesa north of Mortandad Canyon</td>
<td>One or two rooms, probable adobe walls</td>
<td></td>
</tr>
<tr>
<td>LA 16806</td>
<td>S of Pajarito Road, TA 55</td>
<td>Romero log cabin (Fig. 7)</td>
<td></td>
</tr>
<tr>
<td>LA 16807</td>
<td>E of Hwy 4 Loop and south side Water Canyon</td>
<td>Foundations of a log cabin; spring box Corral + privy</td>
<td></td>
</tr>
<tr>
<td>LA 16808</td>
<td>Between Hwy 4 Loop and TA 8</td>
<td>Earth dam, ice house (Anchor Ranch), and WW II guard house (Fig. 8)</td>
<td></td>
</tr>
</tbody>
</table>

LA 14871 in Los Alamos Canyon consists of a vertical tuff post 0.35 m high surrounded by a circular cobblestone floor 4.5 m in diameter (Fig. 2). At the suggestion of Florence Hawley Ellis, I looked to the east from the site and found that Lake Peak, in the Sangre de Cristo Range, was well centered by the mouth of the canyon. Whether the position of Lake Peak was significant to the builders of this small shrine is not known, but Lake Peak is important in the ceremonial life of the people of Nambe, as well as of other groups of Tewa.

On a point of the mesa south of the Phermex facility is an interesting shrine (LA 14859). It consists of four concentric ovals of vertical rhyolite slabs (Fig. 3). There might have been an entry through the east side of the oval.

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Fig. 1. A small isolated cavate room with a well preserved wall and doorway. (meterstick)

Fig. 2. LA 14871. A small shrine in Los Alamos Canyon.
Fig. 3. LA 14869. An oval shrine with vertically set slabs of rhyolite.

At the north rim of Canyon del Valle, and a little more than a kilometer from the nearest dwelling site, are two badly weathered panels of petroglyphs (LA 16804). The figures are mostly geometric, but there is one quadruped and a possible Kokopelli.

C. Agricultural Sites

Two areas, both near canyon bottoms, seem to have been garden plots. In Los Alamos Canyon are a number of alignments of basalt boulders plus a probable one room structure, which could have been a field house (LA 14870).

Near the upper end of Potrillos Canyon is another site (LA 15259) with stone alignments for garden plots and check dams across drainage channels. In addition, there is a small rock shelter on the nearby rocky slope and the shelter has a dry stone wall in front (Fig. 4). This could well have served as a camping place for a field watcher.

Fig. 4. LA 15259. A probable camping shelter above the garden plots.
Trails

Trails are frequently found on the soft tuff surfaces of the Pajarito Plateau; as a rule they are associated with dwellings. At the north rim of Mortandad Canyon, near its upper end, is a deeply cut trail (LA 16803), which has no apparent reason for being. There are no ruins nearby, yet the trail was carefully pecked into the tuff (Fig. 5). Its purpose is unknown.

E. Historic Sites

Five log cabins were located during this period of the survey.

1. LA 14872.

The foundations of a two room cabin were found at the site of the water tank for TA-55. The site was excavated in the summer of 1977 with the aid of members of the Los Alamos Archaeological Society. A separate report is being prepared for this dig.

2. LA 15866.

Thirty-three meters south of the Indian ruin with this number are the remains of a small log cabin. No stone foundation was laid for the one room house and the walls are indicated by impressions of logs on the ground. The cabin's fireplace was built of stone from the nearby ruin. Rusted metal artifacts lie about the cabin site (Fig. 6).

3. LA 16806.

A one room cabin, known as the Romero cabin, lies on the south side of Pajarito Road across from TA-55 (Fig. 7).

4. LA 16807.

Just east of the Highway 4 loop and near the creek in Water Canyon are foundations of a two room cabin and shed. Nearby are a cement spring box, corral, privy, and a possible dug well. According to Mrs. Evelyn Frey, a family named Minche lived here until they were bought out by the Manhattan Project.

5. LA 16808.

Again, east of Highway 4 loop and in the bottom of Pajarito Canyon, are a stone-faced earthen dam and a log ice house (Fig. 8). These probably were part of the former Anchor Ranch buildings.

In addition to the house sites listed above, there is a dry stone wall at LA 14874, which probably was built as a lambing pen by some long forgotten sheepherder.

EXCAVATIONS

Each of the several excavations carried on during 1977 and 1978 is described in this section. The excavations are reported in numerical sequence according to the listing of the sites in the state survey. The work, however, was not done in that order and this may lead to some confusion, particularly for the closely related sites LA 4627, 4628, and 4629. It is hoped that the reader will be able to find a way through the words without too much difficulty.
Fig. 6. LA 15866, the log cabin. The fireplace, made of stones from the Indian ruin, is at left. At right center, the groove made by logs in the north wall can be seen faintly.

Fig. 8. The Anchor Ranch Ice House. The view is of the northeast corner.

Fig. 7. LA 16806. A view out the west window of the Romero cabin.
Within TA-54 was a cluster of seven ruins. Worman (1967) surveyed these and other sites on Mesita del Buey and later dug four of them. Planned expansion of the facilities at TA-54 made it necessary to dig LA 4627 in June 1978.

LA 4627, as most pre-Columbian sites on the Pajarito Plateau, was essentially a double row of rooms—14 in all—with the principal axis running north-south (Figs. 9 and 10).

It is interesting that approximately 20 plants of sagebrush (*Atriplex* sp.) grew on the mound and none in the near vicinity. At the elevation of the ruin, 2100 m, sage is not normally found on the Pajarito Plateau. The plant is common at about 50 m lower elevation and was attracted to the ruin by the rich soil of the midden. A general observation concerning this ruin is that the masonry is poor. Rather large (up to 0.4 m in length) unmodified blocks of tuff were laid up with a large amount of clay (adobe) mortar and the resulting walls were rough and unsightly. Following are short descriptions of the rooms and other features of the sites.

**Feature 1.** Approximately 7 m southeast of the house block was an irregular area, ca 1.5 by 2 m, of old ground surface, which had been subjected to intense heat. The earth was fired to a depth of 3 cm and the burned area was lightly dusted with wood ash. No purpose for the fire could be determined. A possible reason that comes quickly to mind is that the spot was used for firing pottery, but it was devoid of sherds or any other indication of a primitive kiln. One got the impression that only a single large fire was made here and that it had burned most intensely in a center not more than 0.5 m in diameter.
Feature 2—Dwelling Room. The floor of this room was well preserved and was of hard packed clay. The firepit had a flat bottom 15 cm below the top of the molded adobe rim; the latter was raised 3 cm above the floor. No ash was found in the pit—it was filled with the same soil as the room fill. Traces of clay plaster remained on the walls.

Feature 3—Storage Room. A poorly preserved clay floor was the only thing to report in this room. The lack of a firepit indicates that it was used for storage.

Feature 4—Area. At first it was thought that the angle between Rooms 2 and 5 was a room. It proved to be an exterior area with nothing more than a hard packed ancient ground surface to denote former use. It also became part of the midden for the people of the site.

Feature 5—Storage Room. This room once had a good clay floor, but it was poorly preserved. There were no other features in this room.

Feature 6—Dwelling Room. A single piece of construction distinguished this room—an oval firepit 38 by 44 cm in plan and with a bowl-shaped base 12 cm below the rim. The adobe rim was raised 3 cm above the clay floor. Wood ash half filled the pit, but it was not sealed with clay (Fig. 11).

Feature 7—Dwelling Room. At the south end of the house block this room's only feature was the firepit. The pit was 55 cm in diameter and had a flat bottom 20 cm below the rim. The pit was about one-third full of wood ash and was not sealed.

Features 8 and 12—Dwelling and Milling Rooms. These two rooms must be considered together. They were connected by a doorway—an infrequent occurrence on the Pajarito Plateau—and rather obviously represented the quarters of a family.

Room 8 was one of the few rooms in the ruin that had traces of clay plaster on the walls. The clay floor was, for the most part, broken. A firepit 0.5 m in diameter and

Fig. 11. LA 4627. West walls of Rooms 6 and 2. This shows the masonry of the ruin.
0.15 m deep had a flat bottom and no raised rim at floor level. Wood ash partly filled the pit and a carefully laid clay seal 6 to 10 cm thick was leveled off at the floor.

An irregular hole through the east wall just above the floor level might have been an air vent.

Two stone artifacts were found on the floor of this room—a crude chopping tool of basalt and a rectangular slab of basalt of unknown purpose.

In the north wall, the partition between 8 and 12, was a doorway 0.5 m wide. There was no way of telling how high the door was; at the time of excavation the wall stood 0.7 m high and there was no indication of a lintel (Fig. 12).

On the floor of Room 12 were three grinding tools. One of these was a metate and was found lying face down on the floor.

The second was like a metate, but was made of tuff; it too was found upside down on the floor. There is a short discussion of this type artifact in the section on Ground Stone Implements, below.

In the northwest corner of the room the third tool was found, not on the floor, but 4 to 6 cm above it, indicating that it came down with a collapsing roof. Nor was this artifact a metate. It was an unmodified waterworn piece of basalt (Fig. 13), which has two rubbed surfaces. It must have been used for sharpening, honing, or to grind some material other than maize.

Just inside the doorway were two shallow basins, squarish, and ca. 0.3 m on a side (Fig. 14). Neither basin was complete. The basins were 2 to 4 cm deep and were lined with a fine heavy clay plaster. These must have been used to catch the maza prepared on the metates. Near the northwest corner of the room were more fragmentary remains of two other similar basins.

Feature 9—Storage Room. A long room with a poorly preserved floor and no other distinguishing part.

Feature 10—Dwelling Room. We did not find the east wall of this room. A fire in the roof, or in fallen roofing material, hardened the floor in the northwest quadrant of the room, but elsewhere the floor was missing. It seems most likely that the roof of this room was dismantled and much of the wall material taken for other construction. Fire then destroyed much of the small roof material. In the charred remains were several short sections of corn stalk.

A peculiarity of the room was that the firepit, rather than being near the center of the floor or near the east wall, was in the northwest corner of the room. It was 0.5 m in diameter and 0.2 m deep; its flat bottom was lined with small tablets of tuff. There was no wood ash in the pit, nor was it sealed.
Fig. 13. A large, water-worn piece of basalt with a grinding surface rubbed on one face. This probably fell from the roof of Room 12.

Feature 11—Area. This number was allotted to the areas east of Features 12, 15, 16, and 17. Little of interest was found here. There were some small patches of ancient ground surface, but the only things seen on or in the area were three holes (post holes?) in the ground east of Feature 15. They varied in dimensions:

- 13 cm diameter, 16 cm deep
- 20 to 24 cm in plan, 28 cm deep
- 18 cm diameter, 6 cm deep

Features 13 and 14—Storage Rooms. Poorly preserved clay floors were the only things to report for these rooms.

Feature 15—Ceremonial Room. A long room, it had the basic features of an upper Rio Grande ceremonial room. There was an alignment of firepit, deflector, and vent through the east wall, but nothing else. The deflector was of masonry and was no more than 0.5 m long and, at the time of excavation, consisted of only four courses of small irregular blocks of tuff laid up in adobe. An oval firepit 30 by 40 cm and 25 cm deep lay west of the deflector; it had an adobe rim raised 3 cm above the floor. Little ash was found in the pit and it was not sealed.

It is unlikely that the deflector was ever any higher than we found it. Lying on the top of the deflector was a large slab of rhyolite (0.4 by 0.6 m), which must have been the room's hatch cover. The position of this slab also indicates that the roof opening was located above the firepit and deflector.
Nothing more remains to be said about this room except that the floor was of clay, well preserved, and there were extensive patches of clay plaster on the walls.

Features 16 and 17—Storage Rooms. There is nothing more to be said of these two rooms at the north end of the site other than that they had poorly preserved clay floors.

A. Ceramics

Remarkably few sherds were recovered from LA 4627—even for a site on the Pajarito Plateau, where ruins are notoriously lacking in artifactual material. Table II shows a list of the pottery types and the quantities found. Of interest are the two smudged sherds, unusual for a site this early in time.

A general observation on this pottery should be made. All the painted pottery from this site is of the type Santa Fe Black on White and a large portion of it is of high quality (Fig. 15). It would appear that at this tiny hamlet there once lived a group (a family?) of extraordinarily fine potters.

An interesting tool made of a sherd was found in Room 10. A sherd of Santa Fe B/W had one edge ground, beveled from both sides, to create a cutting edge 60 mm long. Similar tools have been reported from the Cochiti area by Snow (1979), but from a later time. The Cochiti specimens are of glazeware sherds.

B. Stone

1. Flaked and Chipped Stone

a. Hammerstones. Three hammerstones, two are spheres of Pedernal Chert and the other a cylindrical river pebble of crystalline stone, were found in the ruin (Fig. 16). The pebble had also been used to rub or polish other objects.

b. Chopping Tools. A full-grooved axe of granitic stone was found in the fill in the doorway between Rooms 8 and 12. It was broken in ancient times and later saw extensive use as a hammer.

Three other chopping tools were crudely made of basalt. Two were pretty obviously hand held, but the third had three pecked notches around its girth for a haft.

### Table II

<table>
<thead>
<tr>
<th>Feature or room</th>
<th>Santa Fe Black on White</th>
<th>Corrugated</th>
<th>Plain Brown Ware</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bowls</td>
<td>Jars</td>
<td>Regular corrugated</td>
</tr>
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<td>12</td>
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<tr>
<td>15</td>
<td>56</td>
<td>3</td>
<td>79</td>
</tr>
<tr>
<td>16/17</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
c. Hatch Covers. A surprising number of hatch covers (four) came from the ruin. All were of slabs of rhyolite tuff 3 to 7 cm thick and each had edges that had been neatly flaked to create straight sides and rounded corners. In one instance the faces of the cover had been smoothed to a slight extent. They ranged in size from 22 by 31 cm to 45 by 52 cm (Fig. 17).

2. Ground and Polished Stone

a. Mano. Only one mano was found during the excavation. This was strange because this type tool is of relatively common occurrence and, in particular, broken manos are frequently found. Not so at LA 4627. Our single mano is a heavy two-hand stone of basalt with a single grinding surface.

b. Grinding Slab. An unmodified granitic river pebble with a working surface of 225 by 260 mm had served as the nether stone for grinding.

c. Mortar. “Mortar” is hardly a proper term for this artifact—“mortar-like” would be better. A hole 45 mm in diameter and 30 mm deep was worn into a piece of tuff. The stone is too friable for heavy use and the purpose of the specimen is unknown.
d. **Vent Plug.** A tuff vent plug (Fig. 18) was found in the fill of Room 3. Shaped somewhat as a truncated cone, it is of a type frequently found in ruins of the Pajarito Plateau.

e. **Tiponis.** Three tiponis were found in this ruin. A discussion of these interesting objects begins on page 48.

f. **Smoother.** An unmodified waterworn pebble of rhyolite has one highly polished surface. The stone is 55 by 60 mm in size and is 20 mm thick.

g. **Hematite Pebble.** A small pebble of hematite was found. Its maximum diameter is 38 mm and it has one worn facet.

3. Miscellaneous Stone Flakes and Chips

Throughout the fill of the ruin there were flakes and chips of stone. These were not as numerous as at other ruins of the area and it would be meaningless to attempt a room-by-room analysis of the material. In order to indicate sources of supply and comparative quantities of stone used, totals of the stone types are listed here.

a. **Traprock (18).** This fine grained basalt is to be found at a number of places in White Rock Canyon.

b. **Pedernal Chert (13).** Quarries of Pedernal chert are located near Cerro Pedernal and south of Gallina on San Pedro Mountain (Warren, 1974).

c. **Obsidian (3).** Local sources of this stone are Obsidian Ridge south of Frijoles Canyon and in the Valle Grande.

C. Bone

A single bone tool, an awl 92 mm in length, was found in the fill of Room 3. It was made from a long bone of a large mammal—probably a deer.

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*Fig. 17. Hatch cover exposed in fill of Feature 15. This proved to be over the deflector and part of the fire pit.*

*Fig. 18. Tuff vent plug.*
In 1957 Frederick Worman dug the northern part (Rooms 1-7) of this site (Worman, 1967). At that time a service road, under construction, was to be cut through the mound so the threatened portion was dug. Planned expansion of facilities in the area in 1976 made it necessary to excavate the remaining portions of the ruin.

The ruin is listed as LA 4628 in the statewide archaeological survey of the Museum of New Mexico. This number was allotted after the photographs published in Worman's 1967 report were taken. In that publication, placards show the site to be RVG 197A, which was the number given during an archaeological survey of the Ramon Vigil Grant made by the National Park Service in 1935. Mr. Worman explained this in the introduction to his report, but it is repeated here to lessen any chance of confusion by those who have occasion to refer to both Worman's report and this one.

Mr. Worman wrote in his description of the site (page 14) that the mound rose some 4 ft (1.2 m) above the surrounding terrain. When I looked at the ruin before starting the 1976 excavation, I also noted that the mound was about a meter above the mesa top. What I did not notice at the time was that the site had been built on a slight ridge that extended from a small hill to the southeast. The fill to be removed was much less than anticipated and, instead of there being a fairly thick midden on the east side of the ruin, there was only the slightest deposit of trash covered by sod.

A well developed piñon-juniper forest with little shrubbery growth lies on the mesas in the neighborhood. Sod of bunch grass (grama and other species) and prickly pear and mammillaria cacti is common.

A. The Ruin

The ruin consisted of a group of 11 rooms; this total included one outdoor work area (Fig. 19). Worman's excavations were of rooms 1-7 and the 1976 dig was of Rooms 8-11. The structure had been one story high and walls of the rooms were of molded clay, which hereafter will be termed 'adobe.' As described in a report of a survey of the Pajarito Plateau (Steen 1977, p. 43), the walls were 15-20 cm thick and were built up in courses of 30-40 cm. As was customary, the basal course was built over a row of unmodified blocks of tuff and occasional stones of the same material were randomly placed in the walls above that course. The latter apparently were used as fillers to speed construction, but there had been no attempt to create masonry.

All evidence indicates that the houses were occupied for only a short period and that roofs were then dismantled to be used elsewhere and the walls, exposed to the weather, were allowed to erode and collapse. The mound was composed largely of blocks of wall material. Floors throughout the structure were of hard packed clay, but all were broken by exposure after the site was abandoned. So little midden material was deposited that my guess at time of excavation was habitation of not more than six months. After additional thought and consideration of the site and artifacts, I continue to believe the site was occupied for an exceptionally short time.
In 1976, three firepits were found; rooms 10 and 11 each had a pit and the third was outside Room 11 at the southeast corner of the ruin. All the pits were somewhat damaged by erosion. The two within the rooms were round in plan and slightly more than a half meter in diameter and each had a clay rim, which was raised some 3 cm above the floor. Both firepits in the rooms were completely filled to floor level with wood ash and then sealed with a clay cover. More severely damaged than the other two, the outdoor firepit was roundish, somewhat irregular, 0.75 m in diameter. It had some wood ash in the basin and was not sealed.

No more need be said about the house itself except that the west wall of Room 9 apparently had been painted with a thin white wash.

On the east side of the mound and the adjacent slope of the ridge was a layer of about 100 stones of tuff (Fig. 20). These were carefully cleaned, but no pattern or purpose could be seen. Most of the stones were lying on the mound. It was only after the 1977 dig at LA 4629 that a possible purpose for the stones could be guessed. At LA 4629 (q.v.) garden borders were laid out on the mound of the abandoned site and it seems probable that a similar garden was planned here. Rocks were brought in for borders, then the project was abandoned.

B. Pottery

A glance at Table III, which lists the types of pottery found during the excavations, will reveal puzzling and contradictory analyses of sherds made by Mr. Worman and myself. The 1957 excavation yielded a preponderance of Santa Fe Black on White sherds and few Wiyo B/W. In 1976, however, I found an overwhelming (comparatively speaking) number of Wiyo B/W specimens and some Biscuit Ware (Abiquiu and Bandelier Black on Grey) as opposed to a handful of Santa Fe B/W pieces.

I do not know the answer to the question raised by this contradiction, but I can guess. Santa Fe B/W was first named by Mera (1935) following earlier descriptions by Kidder (1915) and Amsden (1931) and has included pottery of a rather wide range of texture, color, and design. Worman obviously classified sherds as Santa Fe that I termed Wiyo. The presence of a number of Biscuit Ware sherds in the collection leads me to believe that my analysis of the pottery is the correct one.

None of the pottery types involved is accurately dated and Santa Fe B/W in particular needs study and reevaluation because its characteristics are widely varied. At the present time the following dates are generally accepted for the four types of painted pottery with which we are concerned:

- Santa Fe Black on White, A.D. 1200–1325
- Wiyo B/W, A.D. 1325–1380
- Abiquiu B/Gray, A.D. 1375–1425
- Bandelier B/Gray, A.D. 1425–1475

Because the evidence of excavation indicated a site of quite short occupation (the small collection of sherds supports this), the puzzling collections of pottery from the two digs makes it impossible to estimate a date for the ruin. If Worman and I had dug separate ruins, one would date them at 50 to 100 years apart. As it is, the recovered pottery is meaningless for dating.

1. Ceramic Artifacts

On the east side (outside) Room 9 was a circular sherd disk of buff colored pottery 15 mm in diameter.

2. Stone Artifacts

a. Chipped and Flaked.
## TABLE III

**LA 4628**

**SHERDS RECOVERED DURING BOTH 1957 AND 1976 EXCAVATIONS**

<table>
<thead>
<tr>
<th></th>
<th>Santa Fe B/W Typical</th>
<th>Santa Fe B/W Ext. Slip</th>
<th>Santa Fe B/W Ext. Decor</th>
<th>Wiyo B/W</th>
<th>Abiquiu B/Grey</th>
<th>Bandelier B/Grey</th>
<th>Wingate B/R</th>
<th>Corrugated</th>
<th>Buff Ware</th>
<th>Micaceous Wash</th>
<th>Grey Ware</th>
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</table>

*Two Basket Impressed—different vessels.*
Two arrow points were found in the ruin; both were of obsidian. One was a side notched point with a straight base and the second was side notched with a bifurcated base.

A knife, triangular in cross section, of traprock, came from the floor of Room 9.

Two scrapers were found. One was a large tool of trap rock and the second was a spoke shave type of tool made of a dense red chert.

Three hammerstones, two of Pedernal chert and the other of basalt. Tools of this sort are omnipresent in Rio Grande Valley ruins and Lange (1959, p. 174) has pointed out that the primary function of these tools is to roughen metates and manos.

b. Ground Stone

A grinding slab that originally had been a two hand basalt mano. One face is now slightly concave from being used as a nether stone for grinding. Both faces of this stone have calcite crystals formed in the vesicles of the stone, indicating a past use for grinding or crushing lime.

Two one hand manos were fashioned from river pebbles; one of sandstone and the other of a granitic stone.

A grey micaceous stone is shaped like a whetstone and appears to have been used as one (Fig. 21).

Near, not on, the floor of Room 9 was a tiponi (discussion on p. 51). The position of the object gave the impression that it had been lashed to the ceiling. This tiponi was made of tuff.

C. Unmodified Stone

On the floor of Room 10 was a small piece of yellow crystalline stone. It had not been worked.

A few flakes and chips of stone were found in the several rooms and trenches. Aside from having been struck from larger pieces during the course of tool making, none of these showed evidence of further use. They do give indication of the types of stone used at LA-4628.

Pedernal chert - 67
Obsidian - 22
Trap rock - 19
Dense white chert (source unknown) - 3
Dense red chert (source unknown) - 3

D. Bone

Only three bone artifacts were found during the excavations. Two awls were made from long bones of mammals; each appears to have been made from a radius of a deer.

The third artifact is a bead cut from the femur of a large bird.

In addition to the artifacts listed above, a few unworked bones were found. In the trench on the east side of the ruin we found two humeri and a femur of, probably, a very young deer. Then, in Room 10, there was a clutch of 22 long bones, breasts and backbones, probably turkey, as well as two splinters of long bones of an animal the size of a deer; a metacarpal (probably deer) and a tibia and fibula probably of rabbit. The bones listed above were not shown to a zoological taxonomist and the mammal bones were tentatively identified by consulting Brainard (1939).

Fig. 21. Grey micaceous stone shaped like a whetstone.
On the Mesita del Buey (north of Pajarito Canyon) and within Technical Area 54, this site was surveyed in 1957 by Frederick Worman (Worman, 1967). It had once been located during a survey of the area by the National Park Service in 1935, but that survey produced only a map with a 100 foot contour interval and no site descriptions, so it is quite difficult to identify the sites shown on that map with any assurance—Worman believed that this site was number RVG 196.

Planned expansion of the facilities at TA-54 made it necessary to excavate the ruin in May and June 1977.

A. The Ruin

The mound covered an area of slightly more than 25 m north-south and 15 m east-west. At its center, the mound was approximately a meter above the surrounding mesa top.

From a low hill north of the ruin, a slight ridge extends to the south toward the edge of the mesa. Although the ridge appears to be of soil, there is actually little soil on it and the tuff bedrock is frequently exposed. In those spots where there is earth, it is not more than 20-30 cm thick.

The ruin was, essentially, a double row of rooms aligned north-south [Figs. 22, 23, and 24 (ground plan)]. On all sides of the mound there were short alignments of stones; some of these looked as though they might be upper courses of walls.

Feature 1 (Room). At the southeast corner of the house block, this long, narrow room had been a dwelling. The walls were laid on a flat surface of the tuff mesa top. Irregularities in the tuff surface were filled with earth and then a heavy clay floor was laid; the floor was poorly preserved and, for the most part, was missing.

A small round firepit with no raised rim was found in the northern half of the room. The pit was put down in an area with earth fill, but its base was the rock of the mesa top. Granular grey ash filled the pit to the rim, but it was not sealed with clay as was the pit in Room 2.

This room was a late addition to the site. Adobe walls on the south and east sides were added to existing masonry walls on the north and west sides.

Feature 2 (Room). Feature 2 was a large, rather square room whose two eastern corners were rounded. All the walls were laid on the rock surface of the mesa, then 6 to 8 cm of earth fill served as the base for a heavy clay floor.

A squarish firepit (with rounded corners), 60 by 60 cm in plan and 0.25 cm deep was dug in the eastern half of the room. The firepit was cut into the tuff and had a heavy clay lining; this was carried up to a clay molding, which was raised about 3 cm above the floor.

Fine, white, wood ash filled the firepit to the rim and the pit was then sealed with clay.

East of the firepit, a projection of the mesa top 20 cm in diameter extended 5 to 6 cm above the floor. On the east side of that piece of rock a small slab of stone was set vertically in the floor. The latter looked like a draft deflector, but there was no ventilator in the wall.

No other features or artifacts were found on the floor of this room. In the fill, however, near the east wall and 6 to 10 cm above the floor, were fragments of what appeared to be heavy clay flooring. These were judged to be small sections of roof. With the pieces of clay was a rather large quantity of wood ash, which might have been residue from a roof top firepit. Also found in the fill, and presumably fallen from the roof, was a large, thick metate.

Feature 3 (Room). At the southwest corner of the ruin was a small square room in which we found no features. A prepared grey clay floor was laid on a shallow deposit of the reddish clay that lies over the tuff in the local geological formations (Purtymun and Kennedy, 1971).

Feature 4 (Room). Another small, featureless room had a clay floor laid on unconsolidated clay in its south half. The natural slope of the mesa top, though, made the Indians cut into the tuff by as much as 25 cm in the north half of the room. Over the rock cut part of the floor, as well as the earthen portion, a heavy (2 to 3 cm) layer of worked clay was laid.

Feature 5 (Room). Roots of a large piñon, which formed such a mat in the soil that we left them in place, caused most of the northern portion of this room to remain unexcavated. Again, as in Feature 4, the upper surface of the tuff bedrock sloped up toward the north and the southern half of the room had a clay floor laid on a few centimeters of soil. The north half of the floor was pecked into the stone by as much as 30 cm.

No features were found in this room.
Fig. 22. LA 4629 ground plan.

Fig. 23. LA 4629. View to the south over the excavated ruin.

Fig. 24. LA 4629. View to the southeast over the excavated ruin.
Feature 6 (Room). The south third of this room had a floor laid on a thin lens of soil; the rest of the floor was pecked into the tuff—as much as 45 cm at the north wall. Except for a damaged fire pit near the west wall, there were no features in the room.

The fire pit was approximately 0.5 m in diameter and 12 cm deep. At the time of excavation it contained a small amount of wood ash.

Feature 7 (Area). A trench, which varied in width from 1 to 3 m, was dug along the east side of the ruin. This trench was dug in order to locate structures, such as outdoor fire pits or ramadas, but none were found.

Midden material lay on the surface; it varied in depth from only 2 to 3 cm east of Features 1, 18, and 19 to approximately 20 cm outside Features 2, 6, and 10. Over the midden was a mass of fallen wall, which, in places, was as much as 0.5 m deep. Atop the midden and fallen walls were stone alignments, which were probably parts of garden plots. A discussion of the garden plots follows in the section entitled "Agricultural Practices."

Feature 8 (Room). This was another featureless room, except that on the floor near the west wall we found a metate. The floor of the room was pecked into the tuff (up to 25 cm at the north wall) and was then covered with 5 cm of clay. This surface was smoothed.

Feature 9 (Room). Once again we cleared a room with no features but a rock cut floor. The depth of the pecked stone floor ranged from zero at the south end of the room to 15 cm at the north.

Feature 10 (Room). Room 10 was the most unusual in the ruin. It was a large rectangular room, except that the southeast corner was not found. However that corner was fashioned, we could locate no trace of it.

The floor was pecked into the tuff to a depth of slightly more than 30 cm at the north end of the ruin. A good hard plaster floor, several centimeters thick, was then laid over the stone. Slightly east of the center of the room a circular fire pit was pecked into the tuff; it was 55 cm in diameter, 25 cm deep, and was plastered with clay. The plaster was carried up over the rim to form a molding, which surrounded the pit (Fig. 25).

Just east of the fire pit were two low vertical stone slabs and, at floor level, a vent through the wall.

At the northwest and southwest corners of the room were two low masonry benches. The latter was built up of stone and adobe mortar from the floor, but the one in the northwest corner was rock cut 18 cm above the floor and had a single course of masonry on the rock platform (Fig. 26). The top of each bench stood 30 cm above the floor.
Similar treatment of corners was found by Worman at nearby LA 4632 (Worman, 1967) in a semi-subterranean kiva. All four corners of the kiva at LA 4632 were rounded.

Feature 11 (Area). This feature consisted of a 3 m wide trench along the west side of the ruin. Almost no midden material was found here. The mound consisted almost entirely of fallen wall and the only things found were a few alignments of stone on the mound.

Feature 12 (Room). This was another of the featureless rooms built on the west side of the site. The floor was pecked into rock over its entire extent; at the south end of the room the rock cut was 20 cm and at the north end 45 cm. This and Feature 13 were the deepest cut rooms in the ruin. The stone floor appeared not to have been plastered at the south end, but there were 5 to 6 cm of clay at the north half of the room.

Near the southwest corner a basalt metate was found—working surface down.

Feature 13 (Room). Feature 13 was a rather large room, almost square, with a rock cut floor and firepit. At the south end of the room the floor level was probably about level with the stone surface of the mesa at the time of construction, but at the northwest corner of the room, the floor was 45 cm below the surface.

A firepit, just east of the room center, was pecked into the tuff. The pit was almost a half meter in diameter and 30 cm deep. The pit was plastered with clay and clay formed a rim or molding around it. The pit was raised 2 to 3 cm above the hard packed clay floor. The pit was filled with a mixture of wood ash and fallen wall material—it had not been intentionally filled and sealed.

East of the firepit was a line of six small stones, which might have formed the base for an adobe deflector. A vent through the wall at floor level was in line with the pit and probable deflector. The vent was 20 cm wide and 25 cm high.

No other features were found in this room.

Feature 14 (Room). With this single exception, all the rooms on the west side of the ruin lacked firepits and must be considered storage rooms. This room not only had a firepit, but it also had a vent that went into another room, Feature 15.

The floor of this room was hammered into tuff, but the clay was far from even and a heavy clay layer (6 to 8 cm) was added. The upper surface of the clay was smoothed into a floor.

A firepit was pecked into the floor close to the east wall. It was 40 cm in diameter and had a flat bottom. The pit was plastered with clay, but no rim was made. The pit had only a handful of ash; the rest of its fill consisted of rubble.

The vent was at floor level and was about 20 by 20 cm in size.

Feature 15 (Room). This room was a rectangular structure with an uneven floor and no features. Where the rock surface of the mesa top protruded above the floor line, it had been pecked away, but the room floor was uneven, poorly laid, and not well preserved.

Feature 16 (Area). At the north end of the ruin were two sets of stone alignments, which appeared to be wall tops. They turned out to be alignments for garden plots, laid on the rubble of the mound.

We cleared the rubble and, on the old ground surface, found a large (ca 0.75 m diameter) shallow firepit. The pit was irregular and consisted only of an area from which soil had been scooped down to the tuff and used for fires. Apparently the pit was little used.

Feature 17 (Area). Another area, which proved to be a garden plot rather than a room, was located at the northwest corner of the ruin. We found no features here other than the single alignment of stones.

Feature 18 (Room). At the northeast corner of the ruin was a long, rectangular room. The floor was pecked into the tuff, in part; the east wall of the room was rock cut as much as 25 cm. The floor was of poorly laid clay and was not well preserved; there was no firepit or other indication of use.

Near the east wall, lying in the fill several centimeters above the floor, were two tiponis (see p. 48 et seq). One was made of tuff and the second of basalt.

The Lower Ruin. Forty meters south of the ruin is the edge of the mesa. The cliff here is no more than 7 to 8 m high and, at its foot, is talus, which slopes to the canyon bottom, another 25 m lower in elevation.

A line of pecked steps leads from the mesa top to a group of six cavate rooms and at least eight masonry-walled rooms built in front of the cavate rooms at the top of the slope.

Three of the cavate rooms were apparently ceremonial rooms, but only one had smoke-blackened walls (Steen 1977, p. 14 et seq).
In addition to the rooms, several large cracks in the tuff were noticed. With a hope that these had been used for storage and might contain artifacts, two were cleaned. Some packrat debris lay in the cracks, but other than three crudely fashioned tools and one desiccated maize cob in each crack, nothing was found in them.

Garden Plots. Stone alignments surrounded the mound and extended for some 9 m southeast of the ruin. That is, the alignments were found on a shallow natural drainage channel to a point where the soil of the mesa top petered out near the rim. The alignments were not found within the room areas; there, only the top existing masonry courses of walls were evident (Fig. 27).

As the excavation began, it was thought that several of the alignments indicated walls, but we soon learned that the stones had been placed in position on the mound.

Since that observation, these rows of stone have been interpreted as borders of garden plots. It appears that after the site was abandoned and had fallen into ruin, another group of people laid out small gardens on and around the mound, on the midden, and in a natural wash.

No stones would have been needed on top of the mound because the wall tops would have served the purpose. The late-comers, therefore, would have selected the site in order to utilize the more than normal amount of beneficial minerals found in soils at and near human habitations—a procedure which I like to think of as passive manuring.

There seem to have been similar alignments on the talus below the lower ruin. There, however, the slope is so steep that most of the stones were washed away and too few remain to be sure of the size and position of any garden plots.

Such a belief is supported, but not proven, by the ethnobotanical evidence presented on page 42 et seq.

Who would have done this? Anyone living in the neighborhood after the abandonment of good old 4629. If, as seems likely, roofing timbers were ripped from the structure to be used elsewhere, the rooms would quickly have fallen into ruin and a mound established. Painted pottery from the site is overwhelmingly Wiyo Black on White, so any group living on the Pajarito Plateau after about 1400 could be responsible and a finger can be pointed, with a fair degree of assurance, toward the occupants of Tsirege Pueblo, about a kilometer distant.

B. Pottery

One tool, but no ceramic vessels or ornaments was found at the site. The few sherds found are listed in Table IV and there seems to be no more to be said about them.

The tool was a scraper made from a sherd of Santa Fe Black on White found in the fill of Room 13. Snow (1979) has reported tools of this sort from LA 70, within the Cochiti Reservoir. LA 70 was occupied during the period of glaze paint pottery and was a little later in time than LA 4629.

C. Stone

There may have been a dearth of ceramic remains at 4629, but there was plenty of stone. One fine thing about stone at any site on Mesita del Buey is that if the stone is not tuff, it is foreign to the mesa top.

I. Unmodified Stone.

Much of the stone was in the form of unmodified pebbles of various sizes (Fig. 28). Most of them had been used as rubbing or grinding tools or to hammer (Table V). In a few instances, where the stone had a sharp edge,
TABLE IV
SHERDS RECOVERED FROM THE RUIN
LA 4629

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<tr>
<th>Feature</th>
<th>Santa Fe Black on White</th>
<th>Wiyo Black on White</th>
<th>Abiquiu Black on Grey</th>
<th>Bandelier Black on Grey</th>
<th>Wingate Black on Red</th>
<th>St. Johns Polychrome</th>
<th>Tsankawi Black on Cream</th>
<th>Corrugated</th>
<th>Micaceous Paste</th>
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One sherd of Santa Fe B/W Basket Impressed in each room.

When a slash is shown in a sherd count, the figure on the left indicates the number of bowl sherds found and that on the right is for sherds from jars. Otherwise, all painted sherds are from bowls and all the corrugated sherds from jars.

It was used to chop. All of this stone was carried to the house block. Basalt is present in Pajarito Canyon, only a few hundred meters distant, as well as at other nearby locations. The other stone, all in the form of water worn pebbles, would have come from somewhat greater distances—though not necessarily great distances. Ancient lake bed exposures in Los Alamos Canyon and the Rio Grande gravels could easily have furnished all the types of stone found.

One wonders why such a nondescript collection of rocks was carried onto the mesa. Few of them readily suggest a use and most of those that were used saw only a small amount of hammering or grinding.

Two instances come to mind that suggest a reason for the stones. I know of a young Zuni man who was frequently told by female members of his family to keep sharp eye while he was shepherding; that he should bring home unfamiliar plants, strange looking stones or anything else of interest. The other instance concerns Nina Javelina, a Pima woman who lived at Blackwater, Arizona. At intervals, several times a year, she would take some oddity to Casa Grande National Monument because she thought it must have a meaning. Most frequently the object she took was an irregularly worn river pebble.

Whatever the reason the rocks were taken home, once they got there, they were frequently put to use and, I judge, it was often a spur of the moment use.

2. Flaked and Chipped Stone.

By far the greatest number of stone artifacts from the site were those fashioned by flaking and chipping. Most of these were crudely made; a nodule of chert or traprock was given a few whacks to make a working edge and that was all (Fig. 29).
Five projectile points were recovered from the ruin, all of obsidian, but only two (Fig. 30) were complete. A drill of pink and white chert was also found—the chert is of unknown origin.

Two Pedernal chert hammerstones were found. These were rough spheres about 5 cm in diameter; they were of the type used to roughen the grinding surfaces of metates (Lange 1959, p. 116). A third hammerstone was a water worn quartz crystal battered at each end (Fig. 31).

3. Ground and Polished Stone

a. Axe-Shaped Stone. On the Pajarito Plateau large grooved stones are sometimes found at ruins. The axelike specimen shown in Fig. 32 is one of them. Aside from a few chips knocked off the small end of the tool, there are no use marks on it. How they were used, and why, is a question. Heavy cords must have been lashed around the grooves and the stoned bounced to crush or break something soft.

b. Metates, Manos, and Grinding Slabs. Two metates were found, each in a storage room. The metates were similar in that they were made of large pieces of basalt, which were unmodified except for their pecked grinding surfaces. These metates were made to be used with two-hand manos, and several broken specimens of these were found in the ruin, plus one large, heavy example, which was virtually unused.
TABLE V

UNMODIFIED STONES FOUND IN ROOMS OF THE RUIN

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*Seven of the stones were used for grinding or crushing hematite.

Fig. 31. LA 4629 hammerstones. The specimen on the left is of Pedernal chert and that on the right is a water-worn quartz crystal.

Fig. 32. LA 4629. Axe-shaped tool with hafting notches pecked into edges.
Three one-hand manos, all of granite (Fig. 33), came from the site. These must not have been used with the metates, but with the grinding slabs described below.

Flat river pebbles, three of granite and one of rhyolite, were unmodified except for a rubbed grinding surface on each—one of these was used on both faces. Each grinding surface was stained with hematite. The slabs varied in size from 70 by 95 mm to 120 by 180 mm.

A small mortar of basalt came from the floor of Room 2. Its cup was 65 mm in diameter and 13 mm deep.

During his excavations on Mesita de los Alamos, Fred Worman found, in different ruins, two distinctive nether grinding stones. On each of these the grinding surface was almost flat and it was pitched at an angle of 20° from the base (Worman and Steen, 1978, p. 10). Both were of basalt. Another grinding stone of the same nature came from the fill of Room 5 (Fig. 34). These must have had some specialized use but, so far, there is no hint of what that was.

c. Metate-Like Grinding Stone. A peculiar grinding implement with a deeply worn trough (Fig. 35) was found on the surface near the firepit in Feature 16. It looked like a well-worn metate, but was made of tuff. This friable stone could not have been used to grind foodstuffs and it seems most likely that it was used, with a harder handstone, to grind itself. That is, it may have been used to prepare finely ground grit for ceramic tempering.

d. Wall Vent Plugs. Throughout the upper Rio Grande Valley, Indians formerly made small vents in their walls and then plugged them. In most of the Valley the plugs were of mud, but on the Pajarito, where easily worked tuff was available, the plugs were made of stone. Two of these (Fig. 36) came from the debris of fallen walls.

e. Limestone Slab. A well shaped slab of limestone is a puzzler. The piece is broken and is triangular, with two ground edges 160 mm and 200 mm in length; it is 35 mm thick. Both faces of the stone are unworked, except that
on one side the surface has been slightly smoothed by rubbing (Fig. 37).

f. Tiponis. Two tiponis came from the fill at the east end of Room 18. These and other tiponis are described and discussed on page 48 et seq.

D. Bone

Three bone awls were found in the ruin. All were made of splinters of mammalian long bones—probably deer. They were 55, 63, and 110 mm in length.

Fig. 36. LA 4629. Two tuff vent plugs.

Fig. 37. LA 4629. Broken limestone slab of unknown use.
In October 1965 Mr. Worman excavated most of a small site within TA-53, the Meson Physics Facility. The excavation is described in Worman and Steen (1978) under its site number, LA 4716. It was an interesting site. Two contiguous kivas were surrounded by five rooms; the rooms were featureless except for a firepit in Room 8 (Figs. 38 and 39). Unfortunately Worman's excavation notes were lost and the short description given in the report cited above was prepared from the ground plan and photographs that were taken at the time of the excavation.

New construction planned for the Meson Facility in 1976 was to be erected at the location of LA 4716 so the remaining portion of the pueblo was excavated in April of that year. Whatever high hopes there were before the dig of learning something of this peculiar ruin were dashed by the results. Only a single additional room was found and it was featureless.

A. The Excavations

A broadside swathe (3 m wide) was dug along the southeast side of Worman's excavation. Other than three postholes and a large outdoor firepit, there were no features in the area. Midden material extended from the southeast wall (where it was as much as 20 cm thick) for almost 3 m and, at its outer limits, feathered out on the ground surface.

The firepit was a curious one. Roughly a meter in diameter, it had a heavy adobe collar, which was broken (intentionally) at the east side, and the ends of the collar were separated (Fig. 40). A wing of the collar, or rim, extended to the north for 0.37 m. The flat floor of the firepit was only 11 cm below the top of the rim and consisted of a flat slab of tuff. Both the slab and the pit were deeply burned.

Three postholes were widely separated and formed no discernible pattern.

A long room (R 10) adjoined Worman's Rooms 2 and 6 on the southwest side of the ruin. The room had no features and only small portions of a poorly prepared floor were found. In the south quarter of the room a broken lens of fire-hardened clay 5 to 6 cm thick lay above the floor, but there was no other indication of a fire in that place.

All wall construction in Room 10 was of adobe puddled over a row of stones set upright in the soil. This is the most common type construction for earlier puebloan sites on the Pajarito Plateau (Steen, 1977, p. 43).

Just beyond the northeast limits of the ruin were some short sections of walls. These were so damaged that the size and shapes of any structures of which they might once have been parts could not be determined. No room numbers were applied to these because there was doubt as to whether these wall sections belonged together. A large juniper tree, which formerly grew on the spot, was responsible for some of the damage, but most of it was apparently done during pre-Columbian times. It seems most likely that the builders of LA 4716 destroyed remains of an earlier house, which was, in 1976, represented by only a few short sections of wall and a possible small firepit.

B. Ceramics

As narrated in the ceramic section for LA 4628, there is a discrepancy between Worman's analysis and mine (Table VI). Mr. Worman obviously judged the largest portion of the sherds he found to be Santa Fe Black on White, while I, confronted with similar sherds, put a larger percentage in the Wiyo Black on White category. It is now too late to attempt to re-study the sherds. Other ceramic objects, which were recovered from this ruin, were a rectangular worked sherd of Santa Fe Black on White (Fig. 41) and a fragment of a clay pipe or cloud blower. In addition, two basket impressed Santa Fe Black on White sherds were found.

C. Stone

Stone artifacts found by Worman at LA 4716 were few in number and variety. Six manos (either broken or complete), nine polishing stones, and one large maul were the only lithic artifacts listed in his notes. During the 1976 excavations few more specimens were added to the collection. Three additional one-hand manos (two complete) and a broken two-hand mano were found. In addition, there was a small fragment of a thin, well-finished slab of traprock, which had been well burned; it probably was a piece of a comal, or griddle. One other artifact of ground traprock was a broken portion of what might have been an oval pendant.

Three small flakes of obsidian were used, without modification, as knives or scrapers and a long flake of...
Fig. 38. LA 4716 ground plan.

A - POST HOLES
B - PECULIAR FIRE PIT
WITH SLAB OF STONE
IN CENTER

3 METERS

Fig. 39. View to the SE over the ruin at the conclusion of the 1965 dig.
TABLE VI

CERAMIC TYPES RECOVERED FROM LA 4716 BY BOTH WORMAN (1965) AND STEEN (1977)

<table>
<thead>
<tr>
<th>Worman Excavation (totals)</th>
<th>1976 Excavation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Room 10</td>
<td>Midden</td>
</tr>
<tr>
<td>Santa Fe Black on White</td>
<td>114</td>
<td>2</td>
</tr>
<tr>
<td>Wiyo Black on White</td>
<td>2</td>
<td>---</td>
</tr>
<tr>
<td>transitional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abiquiu Black on Grey</td>
<td>---</td>
<td>11</td>
</tr>
<tr>
<td>Bandelier Black on Grey</td>
<td>---</td>
<td>1</td>
</tr>
<tr>
<td>Jemez Black on White</td>
<td>8</td>
<td>---</td>
</tr>
<tr>
<td>Wingate Black on Red</td>
<td>---</td>
<td>1</td>
</tr>
<tr>
<td>St. Johns Polychrome</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Brownware, plain</td>
<td>---</td>
<td>11</td>
</tr>
<tr>
<td>micaceous wash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility*</td>
<td>532</td>
<td>---</td>
</tr>
<tr>
<td>Corrugated</td>
<td>---</td>
<td>133</td>
</tr>
<tr>
<td>Corrugated</td>
<td>---</td>
<td>10</td>
</tr>
<tr>
<td>micaceous wash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrugated</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>micaceous paste</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*This category apparently contained both corrugated and plain wares.
traprock was retouched around most of its perimeter to make a serviceable knife (Fig. 42).

One tiny fragment of turquoise was found. It is rough and bears no ground or polished surface.

D. Bone

When one considers the paucity of artifacts yielded by the ruin, the seven specimens of worked bone in the artifact collection are impressive. Three of these are shown in Fig. 43. The others, pieces of two awls and a bead, are too fragmentary to picture.

1. Awls

Three bone awls were made from splinters of large mammal bone. Only one is complete enough to show work marks; it has numerous transverse scratches at the tip.

A short bone point fashioned from the distal end of an ulna (of a deer?) saw much use. Two deep grooves were worn in a side of the awl (Fig. 43).

2. Beads

One charred and shattered bone bead turned up in the midden east of the ruin. In addition, two bird femurs, of separate birds, one the distal end and the other the proximal, were cut across the bone. This was done, presumably, during the manufacture of beads.

The identifications of mammal bone were not by a zoologist, but were done with the aid of Brainerd's Field Key (1939).
When TA-49 was abandoned, it was planned to bury scrap metal and other ‘garbage’ in three large trenches. Bulldozers bladed out the trenches and one of them was partly filled with trash when it was determined not to bury the scrap.

One small Indian site was destroyed at one of the trenches, but there is now no way to tell what the site was. A few building stones and some midden material are all that remain. Another small site, LA 15866, was partly destroyed by the digging at another trench (Fig. 44) and it then became hidden in a dense growth of scrub oak so that it was missed during the archaeological survey of 1973-75 (Steen, 1977).

After La Mesa forest fire of 1977, the burned area was searched for ruins that might have been damaged during the blaze and also for unrecorded sites. LA 15866 was located during this second survey.

In 1977 the site consisted of a single row of rooms with a low cairn some 6 m northeast of the rooms. When the disposal trench was dug, the blade of the bulldozer went along the north-south wall, which must have served as partitions between two rows of rooms. The western row was completely destroyed and the only remaining evidence that the site once extended to the west is a thin midden deposit exposed in the western face of the trench.

Thirty-three meters south of the ruin is the location of a small log cabin, which was also unrecorded until after the fire.

A. The Site

Figure 45 shows that the site as it existed at the time of excavation consisted of four contiguous rooms and, to the northeast, a detached structure.

Little can be said of the four rooms (Fig. 45). Each had some poorly preserved floor plaster, but no other feature. This is strange because Pajaritan house blocks normally contained firepits in rooms of an eastern row and, in addition, one or more rooms of the eastern row would have some kiva features. There was nothing of the sort here (see Fig. 46).

A surprisingly large midden for such a small site lay northeast of the ruin. The midden was roughly circular in plan, 15 m in diameter, and had a maximum depth of 25 cm.

Fig. 44. LA 15866. View to the north along the trench cut through the ruin.
Northeast of the ruin a cairn (Structure 4 in the plan) at first appeared to have no pattern, but when loose rocks were removed, a horseshoe shaped arrangement of stones was revealed. The stones were embedded in the midden. Only a single course of stones formed the structure. The stones, which lay at random in the interior of the 'room' and are shown in the plan, were also embedded in the midden, but seem not to be integral parts of the structure. The stones removed from the pile were sufficient to make slightly more than one more course, but they were in such a jumble that they appeared never to have been in place on the wall.

The general appearance was that Structure 4 was of a later period than the houseblock and, presumably, was a shrine. The one sherd of San Lazaro Glaze Polychrome found in the midden gives a hint as to the possible age of this structure.

B. The Log Cabin.

Thirty-three meters south of the Indian site are the remains of a small log cabin. It was apparently a 'line camp' type of dwelling of spartan accommodations (Fig. 47). The logs were laid on the ground with no stone foundations and the floor was dirt. Near one corner of the back wall (this is an assumption, for there is no evidence that the south wall was the back wall) was a small...
fireplace with shaped stone from the ruin. Near the other end of the same wall is a cairn (these stones were also from the ruin) for which no purpose could be determined. A half dozen barrel or keg hoops lay on the ground north of the cabin and scattered nearby were other metal artifacts—two 5-pound lard cans, a burned out tea kettle, and a few cans for fruit or vegetables. No corral, shed, or privy was seen here.

No digging was done at this cabin.

C. Pottery

Of the 55 sherds of painted wares recovered from LA 15866, almost 80% were from Santa Fe Black on White vessels. With a single exception, the rest were Wiyo Black on White. The exception was a sherd of San Lazaro Glaze Polychrome (Table VII).

D. Stone

Seven stone artifacts were recovered from the ruin. None of these was of any particular interest either for excellent workmanship or for unusual characteristics except for a grinding slab of tuff (Fig. 48). This specimen is similar to the one found at LA 4716. The artifacts are listed here.

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>148</td>
<td>A small stone for grinding, limestone. One surface is stained red, with hematite (?)</td>
</tr>
<tr>
<td>149</td>
<td>Scraper or knife of traprock, bifaced.</td>
</tr>
<tr>
<td>151</td>
<td>Scraper/knife of traprock, monofaced.</td>
</tr>
<tr>
<td>152</td>
<td>Flake knife of Pedernal chert with one working edge.</td>
</tr>
<tr>
<td>153</td>
<td>A metate—like grinding slab of tuff.</td>
</tr>
</tbody>
</table>

TABLE VII

POTTERY RECOVERED FROM LA 15866

<table>
<thead>
<tr>
<th>Structure</th>
<th>Santa Fe Black on White</th>
<th>Santa Fe Black on White (sherd impressed)</th>
<th>Wiyo Black on White</th>
<th>San Lazaro Glaze Polychrome</th>
<th>Corrugated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>4 (midden)</td>
<td>20</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>111</td>
</tr>
<tr>
<td>East of 3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>North of 3</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>27</td>
<td>27</td>
</tr>
</tbody>
</table>
THE EARLY CULTURES

In the 1977 report (page 7) I mentioned a portion of a Folsom point that had been found on the north rim of Ancho Canyon. Early in 1978 I was shown the center portion (tip and base were missing) of another Folsom point, which was found at the upper end of White Rock Canyon near Totavi. Although from well outside the survey area, the latter point came from the Pajarito Plateau. The Ancho Canyon point was made of a light brown chalcedony and that from Totavi was of a dense white chert. Both materials were foreign to this vicinity.

Also, during the summer of 1977, I was brought another surface find, a base of a point from lower Bayo Canyon at the north end of Los Alamos lands. This point of Pedernal chert (Warren 1974), is of a type termed Milnesand and, although this point type has not been accurately dated, it has been found in association with a late Pleistocene fauna (Sellards, 1955).

These scattered finds, and there must be more, are strong indications that the Pajarito Plateau was familiar ground to men at the end of the last glacial period. The important question is ‘What were they doing here?’ Both the Folsom points are of material foreign to this region and seem to be of stone that originated on the Great Plains. Pedernal chert, of which the Milnesand point was made, may be considered a local stone because its origin, on the northwest side of the Jemez Mountains, is no more than 50 km distant. Both point types were made by men whose principal occupation was hunting the large Pleistocene mammals of the Plains. Folsom man did camp in the San Luis Valley, 140 km north of the Pajarito Plateau, and bones of Bison antiquus (a late Pleistocene bison) have been found there.

It seems unlikely that there would have been sufficient game in the broken country of the Pajarito Plateau to entice big game hunters. In addition to the rough terrain, there would have been a heavy stand of trees, most likely firs, which would have been deterrents to the large animals. The best guess is that small bands of people visited the Plateau seasonally as fruits, berries, or other plant foods became available.

Seasonal use of the Plateau by people in search of plant foods or other resources such as obsidian, must have persisted until permanent farming settlements were established there in the 13th century.

HOUSES AND HOUSELIFE OF THE PAJARITANS

Records have now been gathered for 24 excavations of ruins that can be considered to have been residences on the Pajarito Plateau. All these sites range in size from 4 to 20 rooms. Data for some of these ruins are meager, but the amount of our knowledge of the houses of the puebloan occupation here is becoming substantial.

There is a small question as to what to call these sites. Pueblo/village are too grandiose terms for such small communities and the English ‘hamlet’ seems out of place. Several writers have referred to them as pueblos and that seems suitable. Other names that can be applied are farmstead, houseblock, and settlement. All these terms are used in this report, but there is no attempt here to use any one of them in preference to the others.

In the 1977 report on surveys and excavations on the Plateau, I presented an outline of the types of habitation sites to be found here. A progression of building types was described—1 and 2 rows of rooms oriented N-S at first and later on U-shaped and quadrilateral arrangements of rooms around a central kiva, and, finally, the late great pueblos like Tsirege.

That sequence is still a valid one, but things are not as clear cut as they might be. For one thing, the custom of building rows of rooms persisted into the period of the Biscuit wares (Abiquiu and Bandelier Black on Grey) and might well have lasted into the time of the large villages.

Unfortunately we have no good dates for any of these ruins. The earliest Puebloan sites on the Pajarito yield Santa Fe Black on White pottery and seem uniformly to be built with adobe walls. A wall was started in a shallow construction trench in which a row of tuff stones was placed. Damp clay was then molded over the stones to form a mass some 20 cm thick. This was then carried up 30 to 40 cm high to form the first course of the wall and then allowed to dry before another course of mud was
Stones were sometimes added to the walls as they went up, but they appear to have been fillers and not used to create masonry. Inside surfaces of these walls were generally plastered with the same sort of adobe as that of the walls (Fig. 49).

Later, but how much later is not known, a rough masonry was used for house building. Blocks of tuff were obtained and these were laid with an adobe mortar to create a rather weak masonry, which I call 'rough block' (Fig. 50). At sites built in this fashion, Santa Fe Black on White is usually the principal pottery type, but Wiyo Black on White is also found.

A third and final type of construction, which can be termed 'cut stone,' appeared on the Plateau in late Wiyo Black on White/early Abiquiu Black on Grey times. Long pieces of tuff, as much as 1 m long (Fig. 51), were shaped by pecking and were laid on walls with adobe mortar. The stones were steadied by chinking with spalls (Fig. 52). Walls were finished with a coating of adobe plaster on the inside surfaces and, possibly, on the outside as well.

Adobe walls continued to be made throughout the Puebloan occupation of the Plateau, as was the rough block masonry after it was introduced. It is not common to see walls of all three types incorporated in a single structure.

Walls of dwelling rooms were plastered with adobe and sometimes storage room walls were also given a plaster coat. In all the rooms of sites on the Pajarito Plateau dug so far there has been no indication of decoration, painted or otherwise. A single possible exception is that the west wall of Room 9 at LA 4628 might have had a thin whitewash over the adobe plaster.

Buildings were uniformly only one story high until Biscuit ware times—late 14th century—when two and three story structures began to be erected. All the sites described in this report were of the one story variety.

Entrance to a room was through a hatch in the roof. No outside doorway has been reported from the Plateau and the doorway between Rooms 8 and 12 at LA 4627 is one of only two reported from the area. Roof hatches were covered with shaped slabs of rhyolite (Fig. 53); several of these have been found.

Fig. 49. LA 4628. Adobe walls.
Fig. 50. LA 4627. Walls of rough block masonry.

Fig. 51. LA 4629. A long piece of cut stone from a wall. (meter stick)

Fig. 52. LA 4619. Walls of cut stone.

Fig. 53. LA 4722. Rhyolite hatch cover. (15 cm scale)
Three types of rooms are found in these settlements: living rooms, storage rooms, and ceremonial rooms. Living rooms are distinguished by a firepit, a well-laid adobe floor, and by adobe plaster on the wall. Storage rooms lack a firepit. The floors sometimes are of hard packed clay, but frequently are no more than the clayey soil of the mesa top beaten down by use. Walls of storage rooms are sometimes plastered. On the floors of these rooms metates are sometimes found and, in Room 12 at LA 4627, several shallow basins in which meal from the metate could be caught.

Much remains to be learned about the third category of rooms—ceremonial. Arbitrary characteristics to designate these rooms: an alignment of firepit, deflector, and vent, plus a larger than normal size and a curved eastern wall. The latter two distinctions are not always present. Vents are square—20 to 25 cm on a side—and are placed through the east wall just above floor level. Deflectors are sometimes three or four slabs of rhyolite set vertically in the floor between the firepit and vent, but most frequently are a short section of poor masonry.

As outlined by Hawley (1950), there is a sharp distinction in both form and use between three types of ceremonial structures in the upper Rio Grande. The sort of room described above should not be confused with the kivas of a slightly later period.

At the time of this writing, only two kivas have been dug, and described, within Los Alamos lands. One was a rock cut kiva at LA 4632, excavated by Worman and described in his 1967 report. The other was at LA 8681 (Fretwell, 1959).

Some of the pueblitos had no ceremonial room, about half had only a single one, and LA 4629 and LA 8681 had three and four, respectively. In an attempt to gain some thoughts on how the pueblitos were used, Table VIII was prepared. The list of sites in that table includes all those on Los Alamos lands for which reports are available except LA 15855, which was dug by someone unknown. The latter site is still well enough preserved so that information can be derived from it. Records for five other sites, LA 4723, LA 4724, LA 4726, and the two airport sites, are incomplete and the number of rooms with firepits is not known.

To prepare the table, I chose only those sites with four or more rooms. Ruins with fewer than that number probably were not residences and should be termed field houses for temporary living and storage.

The sites listed are so small that one wonders whether related families lived in them. If each hearth represented a nuclear family, then a house block sheltered from one to five families, that is, if all the rooms were occupied at one time. I have found it impossible to determine whether some rooms of these houseblocks were in use while other contiguous rooms were abandoned and already in ruins.

It seems most likely that one or two families, probably closely related, would build at a location and later be joined by another family or two. This has not been clear enough to demonstrate however. So little middens material lies about the ruins that one feels they were occupied for only short periods of time. The middens are composed of charcoal impregnated soil, with few sherds or stone debris, and generally have a maximum thickness of 25 cm or less.

Table VIII shows, in the third column, the total number of internal firepits at each site. Four hearths are shown for LA 4659, for instance, and that figure includes the firepit in the ceremonial room, so room use at the site would have been three dwelling rooms, one ceremonial room, and eleven storage rooms. That figure is a little heavy in the category for storage, but not too much. That proportion of room classification holds well through the list except for LA 4716, LA 4629, and LA 8681.

LA 4716 was possibly a unique site. The midden material near the ruin was more abundant than at most other small sites on the Plateau, yet the room designation could be made as one living room, two ceremonial rooms, and one storage room. As is told on page 30, there is indication of extensive rebuilding or even demolition of an earlier structure, which was then replaced by the present one. Was this a sort of community ceremonial center? Two ceremonial rooms with a dwelling for a custodian or priest and a large storage room seem the most likely explanation of the room uses. Possibly the irregularly shaped rooms surrounding the kiva-like rooms were not used for any domestic purpose. Whatever the purpose of LA 4716, it was certainly a distinctive structure.

Two of the other sites listed deserve comment—LA 4629 and LA 8681. At each of these ruins some Abiquiu Black on Grey was found. This indicates a slightly later date than those of the other sites listed. At LA 8681, there was a semi-subterranean kiva and that type religious structure apparently was not introduced to the Plateau north of Frijoles Canyon until the time Abiquiu Black on Grey was made. LA 4629 had three ceremonial rooms; LA 8681 also had three ceremonial rooms in addition to the kiva.

At LA 4629 the ground plan (Fig. 22) indicates there were three dwelling rooms, three ceremonial rooms, and
### TABLE VIII

EXCAVATED ROOMS ON LABORATORY LANDS WITH POSSIBLE NUMBER OF CEREMONIAL ROOMS

<table>
<thead>
<tr>
<th>Site</th>
<th>Number of Rooms</th>
<th>Rooms with Firepits</th>
<th>Ceremonial Rooms</th>
<th>Wall Construction</th>
<th>Painted Wares</th>
</tr>
</thead>
<tbody>
<tr>
<td>4611</td>
<td>5</td>
<td>1</td>
<td></td>
<td>Rough block</td>
<td>Santa Fe Abiquiu</td>
</tr>
<tr>
<td>4627</td>
<td>17</td>
<td>4</td>
<td>1</td>
<td>Rough Block</td>
<td>Santa Fe Abiquiu</td>
</tr>
<tr>
<td>4628</td>
<td>11</td>
<td>3</td>
<td></td>
<td>Adobe</td>
<td>Santa Fe Wiyo</td>
</tr>
<tr>
<td>4629</td>
<td>15</td>
<td>6</td>
<td>3</td>
<td>Cut Stone</td>
<td>Santa Fe Wiyo*</td>
</tr>
<tr>
<td>4631</td>
<td>8</td>
<td>1</td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe Abiquiu</td>
</tr>
<tr>
<td>4632</td>
<td>20</td>
<td>3</td>
<td>1</td>
<td>Rough Block</td>
<td>Santa Fe Wiyo*</td>
</tr>
<tr>
<td>4634</td>
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<td>4</td>
<td></td>
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<td>Santa Fe</td>
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<td>4659</td>
<td>15</td>
<td>4</td>
<td>1</td>
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<td>Santa Fe</td>
</tr>
<tr>
<td>4666</td>
<td>4</td>
<td>2</td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe Wiyo</td>
</tr>
<tr>
<td>4668</td>
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<td>3</td>
<td></td>
<td>Adobe</td>
<td>Santa Fe</td>
</tr>
<tr>
<td>4710</td>
<td>7</td>
<td>3</td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe Wiyo</td>
</tr>
<tr>
<td>4712</td>
<td>10</td>
<td>2</td>
<td></td>
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<td>Santa Fe Wiyo*</td>
</tr>
<tr>
<td>4714</td>
<td>8</td>
<td>1</td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe Abiquiu</td>
</tr>
<tr>
<td>4716</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>Adobe</td>
<td>Santa Fe Wiyo*</td>
</tr>
<tr>
<td>4722</td>
<td>7</td>
<td>2</td>
<td></td>
<td>Adobe</td>
<td>Santa Fe Wiyo</td>
</tr>
<tr>
<td>4723</td>
<td>9</td>
<td></td>
<td></td>
<td>Adobe</td>
<td>Santa Fe Wiyo</td>
</tr>
<tr>
<td>4724</td>
<td>5</td>
<td></td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe Abiquiu</td>
</tr>
<tr>
<td>4726</td>
<td>6</td>
<td></td>
<td>1 ?</td>
<td>Rough Block</td>
<td>Santa Fe Wiyo*</td>
</tr>
<tr>
<td>4729</td>
<td>10</td>
<td>1</td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe Wiyo*</td>
</tr>
<tr>
<td>8681</td>
<td>23</td>
<td>5</td>
<td>4</td>
<td>Rough Block</td>
<td>Santa Fe Abiquiu</td>
</tr>
<tr>
<td>15855</td>
<td>20</td>
<td></td>
<td>1</td>
<td>Rough Block</td>
<td>Santa Fe Abiquiu</td>
</tr>
<tr>
<td>15866</td>
<td>4 +</td>
<td></td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe Wiyo</td>
</tr>
<tr>
<td>Airport No. 1</td>
<td>5</td>
<td></td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe</td>
</tr>
<tr>
<td>Airport No. 2</td>
<td>9</td>
<td></td>
<td></td>
<td>Rough Block</td>
<td>Santa Fe</td>
</tr>
</tbody>
</table>

*Indicates the predominant pottery type.
nine storage chambers. The figures imply—almost shout at one—that three family units lived at the site and that each family had a room to live in, a room for religious purposes, and three rooms for storage and milling.

The situation at LA 8681 is not so obvious. In going through Mrs. Fretwell’s notes I classified as ceremonial those rooms with firepit, deflector, and vent. Mention of a firepit was made for only one other room. There must have been a few more in a 23 room houseblock.

Although most of a family’s time seems to have been spent outside the dwelling room, it seems not to have been spent on the ground in the shelter of the house, but on the roof... little evidence of activity can be found on the surface near the houses, but signs of rooftop use are abundant. In the fill of nearly every dwelling room, and of some storage rooms, are found remains of roof firepits—fragments of the fired adobe lining of the pits with quantities of wood ash. The pits were bowl shaped with flattish bottoms. No instance of a stone bottomed roof firepit was found.

Apparently there was ritual involved when a house was abandoned. Floors were swept clean; it is a rare occasion when an artifact is found on a floor of one of these small houses. The exception to this rule is that metates are sometimes found on the floors of storage rooms. The metate is generally found with its grinding surface down. In addition to the cleanup, a fire was apparently kept in the hearth until the pit was filled with ash and then the pit was covered with a 2 to 3 cm layer of adobe. This practice was carried on in both living and ceremonial rooms, but only about half the hearths were sealed.

Apparently the final act of a family was to dismantle the roof and take away the roofing poles to be used at the new homesite. This meant that a mass of wall material, broken roof adobe, and the litter of stones, broken tools, and trash that lay on the roof were pitched down onto the freshly cleaned floor.

As a postscript to this description of early Pajaritan dwellings, it should be said that it has been suggested that some of these sites might have been residences for huertas or small summertime garden plots. I believe not, principally because of the consistent presence of ceremonial rooms in the pueblitos. This suggests, strongly, year round dwellings.

VEGETAL FOOD—PRODUCTION AND PREPARATION

An important aspect of early pueblan culture was the production of plant foods, i.e., agriculture. During the several hundred years that Pueblo Indians lived on the Pajarito Plateau, both nonirrigated (dry) and irrigated farming methods were practiced.

At the onset of this period it appears that dry farming was the only method used. Pueblitos that would have housed only one to four nuclear families were built along the crests of the mesitas from what must have been the upper limit of cultivation to near the rim of White Rock Canyon of the Rio Grande. Much of the land could only have been dry farmed, particularly that on the mesa tops. At their upper reaches, the canyons of the Plateau are deep, narrow, and chill—unfit for agriculture. As one approaches the Rio Grande, the few perennial streams are so deeply entrenched that their waters would not have been available for irrigation. Thus, the broad plain-like area at the site of White Rock community must also have been dry farmed. Possible exceptions to this are restricted areas of Mortandad, Pajarito, and Water Canyons, but there are no remaining evidences of irrigation structures along any of those streams.

It is not known how many pre-Columbian sites were located within the present limits of White Rock, nor what periods they represented. A National Park Service survey in 1935 showed only two sites within the area, but others have been described. Los Alamos Archaeological Society has dug two sites at White Rock: LA 8681 (Fretwell 1959) and LA 14020, for which a report is not yet available. The latter site was apparently a series of garden plots with stone borders. It would have been used for dry farming. Such sites are not prominent in the landscape and can easily be overlooked by persons not searching for them. How many more such garden plots once existed in the White Rock area is a question that cannot be answered. Garden plots are also located on the mesa tops, usually near house ruins. The stone alignments would have served as foundations for low mounds of soil similar to the “waffle garden” borders at Zuñi Pueblo shown in Fig. 54. At Zuñi, the borders are used to contain irrigation water, but for dry farming, they are used to catch and hold every little raindrop that falls.
Small check dams across minor drainage channels performed the same service. They hold runoff waters with their alluvial content so that a few plants behind each dam would receive moisture enough to carry them to maturity.

It is an effective way to grow a crop—if the farmer has a small enough plot and enough time to mulch and care for each plant. At Mesa Verde National Park the staff has planted and cared for such a garden plot since 1930. They use primitive type seeds and give the plants a minimum of care—weeding and mulching only. The only concession to modernity is that the Park people use a hoe rather than a dibble. During the nearly 50 years since the garden was established, there have been some poor harvests, but only one crop failure and that was in a year in which the summer rains, though ample in amount, arrived too late to help mature the crop.

Many of the garden borders are on soils that are much too thin to nourish such crops as maize, beans, and squash. It has been suggested that at such places, plants that we today consider to be weeds, such as grain amaranth, tansy mustard, and others were grown.

Mesita del Buey, north of Pajarito Canyon, is the only mesa between Frijoles and Bayo Canyons for which there is no record of modern farming and ranching activities. Because of this we are carrying on soil tests to learn whether it will be possible to locate ancient fields on the mesa tops. An initial experiment failed to yield definitive results and another tack is now being tried.

Soil samples from Mesita del Buey and two other locations were submitted to Vorsila L. Bohrer (Appendix A) for palynological examination. Miss Bohrer was asked to search only for maize pollen, but she also noted the presence of cattail and prickly pear pollens. Locations of the spots from which the soil samples were taken are

Transect 1 (with seven stations A-G). This was a north-south line across Mesita del Buey, just east of archaeological site LA 4627. Stations C, D, and E were from midden soils of this ruin.

LA 354 is at the extreme east end on Mesita del Potrillo. A basalt flow is exposed there and over an area of more than 10,000 m² there are garden plot borders and terraces with a few one room field houses.

LA 12698. In Water Canyon is a site similar in nature to LA 354. It also consists of garden plots on a lava flow, but its extent is only about half that of LA 354.

LA 4629 is a puebrito with garden borders on the midden (see the description below). The samples were taken from the plots.

A few words need to be said concerning the presence of both the prickly pear and cattail pollens. Several species of prickly pear (opuntia) are common on the mesa tops. Wherever there is standing water in the canyon bottoms and in a few places on the mesa tops where waste water collects, cattails quickly form stands. There would have been no possibility for the plants to grow at either of the locations from which Miss Bohrer found the Typha pollen. The tule has been put to many uses and one should bear in mind that the plant’s pollen has been and is used ceremonially in the same manner as maize pollen. John Bourke’s 1892 description of the use of tule pollen by the western Apache and Frank Russel’s 1908 account of its use by the Pima give an idea of how extensively this pollen was used in the southwest.

A particularly interesting aspect of primitive farming was noted on Mesita del Buey. At LA 4629 stone alignments were seen on the mound. When we worked along these rows of stones it was seen that they were on the midden, not in it. The alignments were also found across a shallow drainage channel below the ruin. A search of
other ruins on the mesa showed that most of them also had similar rows of stone (Figs. 55 and 56).

The pueblito had fallen into ruin by the time the alignments were laid. The stones were put onto mounds where the predominant painted pottery types ranged in age from Santa Fe B/W to Wiyo B/W to Abiquiu B/Gr, a possible time span of about 150 years. Few instances of the practice have been seen on other mesas. The inhabitants of Tsirege ruin (LA 170), which lies at the eastern end of Mesita del Buey, are most likely to have been the ones who laid out these small garden plots. Tsirege is commonly thought to have been the latest occupied village on the Pajarito Plateau and its occupants could easily have planted seeds on the rich soils of the former homesites of their predecessors.

Preparation

From the midden of LA 4716 we recovered a half dozen sherds from the base of large corrugated jar. On the inner surfaces of the sherds were incrustations of a whitish material—as much as 6 mm thick in one instance (Fig. 57). Certain that the crust was desiccated foodstuff, the sherds were taken to Raymond N. Rogers of the Laboratory staff who quickly determined that the stuff was lime and that plant remains appeared to be imbedded in it. Further investigations of these deposits were made by Vorsila Bohrer (Appendix B).

Later, during excavations of LA 4627 and LA 4629, a heavy two-hand mano was found at each ruin. On the grinding surfaces of these manos was found more white material and, still hoping for the remains of someone's dinner, these also were taken to Rogers who again showed that the material was lime. In these instances, when the lime was subjected to microscopic examination, calcite crystals were found within the vesicles of the stone (Fig. 58).
Fig. 57. Sherds from the midden of LA 4726. Thick calcium deposits indicate the use of lime in cooking.

Fig. 58. Magnification of the grinding surface of a mano from LA 4629, which shows a calcite crystal that formed within a vesicle of the stone. (30X magnification)
This find gave the best clue as to what the ancient Pajaritans were doing. Pretty obviously they were preparing anhydrous lime (though we do not yet have direct evidence of that step) then boiling that with corn to make posole (Figs. 59 and 60). After the manos were used to crush the anhydrous lime they were set aside and eventually became damp so that the lime crystalized again. The important thing here is that the lime deposited within the vesicles was anhydrous.

It has generally been assumed that corn boiled with lime was a cooking trait introduced to the Rio Grande by Tarascan servants of the early Spanish settlers. The custom is well established and of ancient origin in Mexico. Redfield (1930, p. 39) wrote

"Maize is boiled with lime and ground on the metate to make a dough which is the basis of a variety of food."

Here we have pretty good evidence that the same sort of food preparation was an antique practice in the upper Rio Grande.

Further use of anhydrous lime by the Pajaritans was learned in 1978 by the find of two early glaze paint ware vessels in White Rock Canyon. One of the vessels was filled with a garment or net to which were attached feathers of the scarlet macaw (Ara macao). The second jar was placed mouth down over the first and the two then sealed with a lime plaster (The Atom, 1979; Steen, 1980).

BASKETRY

Small close-coiled baskets were common features of households during the first century of pueblan occupation of the Plateau. We know this because of frequent finds of Santa Fe Black on White sherds, which were molded in baskets. To judge by the sizes of the bowls, these baskets averaged 15 to 20 cm in diameter and about 10 cm deep.

Two other baskets of an unusual style were found in a pocket in the tuff at the lower end of Sandia Canyon. The baskets were probably identical and were flat bottomed with straight, short sides (Fig. 61) and of one rod foundation with interlocking coil. On the base of the best preserved of the pair, a design was woven. It was a simple zigzag pattern repeated three times from a circle at the center. The design was probably woven in black though, at the present time, it appears as a darker set of coils than those of the basket proper. With these baskets, four corrugated sherds and two desiccated corn cobs were found—of little use for dating.

HUMAN BURIALS

A frequent question asked about Pajaritan archaeology is “How were the dead disposed of?” During almost 300 years of pueblan occupancy of the Pajarito Plateau between Bayo and Ancho Canyons, several thousand persons must have died, yet we have evidence of only a few hundred burials.

During the final century of the period, that in which the large sites like Otowi and Tsirege were occupied, some dead were interred in earthen mounds. In the early years of the 20th century all the burial mounds were dug. No excavation notes and only a few published descriptions of the finds are available (Hewett, 1938; Wilson, 1916, 1918).

What we know of the interments in the mounds is that some were secondary burials and some were accompanied by ceramics or other artifacts. At all the big sites there was a total of only a few hundred mound burials and this number would be far less than the population for the period.

Fred Worman mentioned no burials in reports of his investigations. A few human bones were among the materials collected by him during his researches, but no data were listed for them.

Since 1972, when I began my studies at Los Alamos, I have seen only two burials and each was reported to me.

In the 1977 report I described a burial at LA 4664. It was the burial of a young woman who had been laid, flexed, on the floor of an abandoned room then covered with building stones. At the time this burial was excavated I found no pottery or other datable material. I later returned to the ruin and by diligent search found a single potsherd—plain ware made with micaceous clay. The ruin was almost destroyed by construction years ago and evidences of only two rooms remain. The walls of one room were built with unmodified tuff blocks and the other of long, shaped blocks of tuff laid with spalls of stone to steady the courses. The latter style apparently began during the period when the biscuit wares (and brown ware with micaceous paste) were being made. We have, therefore, some slight evidence for the period in which the young lady was laid to rest—the latter part of the 14th century or later.

Another burial was reported at LA 4608 and in August 1976 I cleared what remained of it. The burial also had been severely damaged by heavy equipment. It
Fig. 59. Gas bubble crater, formed during boiling, in surface of the lime deposit on a sherd from LA 4716. (30X magnification)

Fig. 60. Fleck of charcoal in the lime crust of the vessel found at LA 4716. (30X magnification)

Fig. 61. Basket found in cavity in a cliff in Sandia Canyon.
was of a child who had been laid in the midden, head to
the north, and with its legs flexed.

Hewett (1904 and 1909) described narrow intra-mural
burial chambers in which several bodies were laid, as
well as the burial mounds on the south sides of the large
late pueblos. The burial mound at Tsirege had been dug
into before his investigations and he had little informa­
tion to offer concerning them. Hewett also speculated on
the small number of burials found in this area and
suggested that many of the dead might have been placed
in shallow graves on the talus slopes of the canyon sides.

So, we still know little about Pajaritan burial practices.

SACRED STONES—EFFIGIES AND TIPONIS

A. Effigy

A single effigy has been found during the Los Alamos
surveys. It was picked from the surface at LA 170
(Tsirege) by a visitor during an afternoon in 1978 when
the ruin was open for public visitation. The figure was
made of tuff; it was 17 cm high by 10 cm wide. Only the
back side of the specimen remains. It was split vertically
through the center and the “front” is missing. In all
probability the figure was humanoid, but the back is
featureless up to a line that seems to represent a shoulder
and neck. The head is also featureless except for vertical
grooves, which might indicate hair (Fig. 62).

Crudely made human effigies of stone are sometimes
found in ruins of the upper Rio Grande. Wendorf (1953)
reported two from Te’ewi in the Chama Valley; both had
some rudimentary human features. Presumably the other
side of this specimen had some similar design.

In 1919 at excavations at Po-Shu-ouinge, in the
Chama Valley, J. A. Jeancon found a “horned” artifact
of basalt. His Tewa workmen identified it as a Koshare
fetish. A similar specimen 18 cm in length and 7 cm in
height was found on the surface at LA 20969 (Fig. 63).

B. Tiponis

During the excavation of LA 4628, the large shaped
stone shown on the right in Fig. 64 was found. A short
article about the find was published in the Los Alamos
publication, The Atom, and that promptly brought
telephone calls from two men who had found others on
the surface near other ruins (Fig. 65). In addition, several
tuff wall plugs were reported. Later, excavations at LA
4627 and LA 4629 turned up three other tiponis and
Florence Hawley Ellis showed me the specimen (Fig. 66)
that one of her former students had found at Tunque ruin
in the San Felipe Wash.

These are interesting stones. For years they have been
called tiponis. Lange (1944, 1936) reported three from
the Gallina area and in his reports termed them tiponi.
The word tiponi is of Hopi origin and, according to
Stephen (1936) and Voth (1936), these were fetishes
made of wood or perfect ears of maize wrapped with
cords and topped with feathers, which were placed on
altars to represent the corn goddess. These objects were
kept by certain priests and succeeding priests inherited

Fig. 62. Portion of an effigy found on the surface at LA 170.

Fig. 63. Koshare fetish from surface of LA 20969.
Fig. 65. LA 32. Little Otowi. This tiponi was found on the surface and the protected side retains some clay plaster.

Fig. 64. Left—Specimen No. 132 from LA 4629. Right—Specimen No. 83 from LA 4628. Both are of tuff.

Fig. 66. Tiponi with light colored clay plaster. It was found at Tunque ruin on San Felipe Wash. The figure is made of tuff.
them. This was not the case with the Pajaritan tiponis, which were abandoned with the houses.

The term tiponi has been loosely applied in recent years and one wonders how these rather large pieces of shaped stone received the same appellation as the small fetishes of organic materials.

Early finds of these stones were reported in various manners. Fewkes (1911) described "...an idol, possibly the earth goddess..." and Jeancon (1923) shows, in Plate 51 several, "tiponi or prayer plume bases." In the same report, plate 59, he pictures several fire dogs and one of these, tall and cylindrical, should probably also be classified as a tiponi. Jeancon seems to have been the first to apply the term to archaeological specimens.

Roberts (1932) reported finding "corn goddess symbols" lying on their sides on the floor of a kiva. Parsons (1940) then, in a paper that suggested archaeologists go more regularly to ethnological sources for interpretation of artifacts, said of Robert's specimens "...are not amulet but fetish stones, stones into which the spirits came and went, because today stone fetishes, or other kinds, are put on their sides at the conclusion of ceremonies, after the spirit has left." Morris (1939) also described two "corn goddess symbols" from his Site 41.

They are usually thought of as altar pieces and certainly the specimens shown in Fig. 67 would seem to have been such. The first has two holes in the base, which could have been "feeding" holes as mentioned by Parsons and the second has a hole at the top to hold prayer feathers. These two do not conform to a pattern nor, for that matter, do any of the others. Several have one or more flat or flattish sides and two were found with plastered surfaces. Smith (1952) once asked the question "When is a Kiva?" and at the end of the chapter

Fig. 67. Tiponis.
Left—From LA 4632.
Right—From LA 4627.
answered "When the excavator believes it is." The same holds true for these earth goddesses, corn goddesses, or tiponis.

An interesting fact of the provenience of each of those found during the Los Alamos excavations is that none was found in a position in which it had been used or stored. Each was found in the rubble of fallen walls. My first thought was that they had been lashed to ceiling timbers and fell when roofs were removed; later I thought that some sort of shelving on walls might have been involved. Florence Hawley Ellis, in conversation, made a suggestion that sounds reasonable—the stones were placed atop house walls to serve some sort of protective function. That might be a correct assumption for some of the stones, but two of those shown in the photographs reproduced here, those in Figs. 65 and 66, were plastered. They must have been kept indoors. Other tiponis found in this area are pictured in Figs. 68, 69, and 70.

Whatever purpose the stones had, it apparently was good for that particular homesite only. The ancient Pajaritans cleaned the floors of their rooms when they left a farmstead, but left lots of rubbish on the roofs and that included at least an occasional tiponi.

One day a student will set out to gather all available information concerning these intriguing stones and will propose a suitable name for them; in the meantime, "tiponi" will do, for this report at least. The word sounds better than earth goddess.
Fig. 69. Tiponis.
Left—No. 134 from LA 4629.
Right—No. 178 from LA 4629.
WHO AND WHAT WERE THE PAJARITANS?

For a number of years suggestions and arguments have been made to explain some cultural developments in the upper Rio Grande Valley by bringing in Anasazi migrants, in particular from the San Juan and the Cibola/Gallinas areas.

This cannot be so. The evidence, not only in the Los Alamos survey area, but elsewhere in the valley, indicates an unbroken cultural tradition, which extends from a respectable level of antiquity to the present. It is my feeling that the puebloan population of the Rio Grande Valley has been static for at least 2000 years and during this time has experienced only minor group movements, such as the divisions of the Tiwa and the Towa.

In the 1977 report I outlined the principal reasons for arguing that no migrants entered the Rio Grande to change life patterns. I will list them again here.

1. There is no real physical evidence of foreign groups in the Rio Grande. Pottery styles are frequently presented as evidence of the newcomers, but 13th century Rio Grande painted pottery reflects generalized patterns, which are found throughout much of the puebloan area. I cannot understand how anyone who has worked in either the San Juan or the Cibola areas can move to the Rio Grande Valley and see close resemblances of the material and artistic cultural remains.

2. There is continuity of construction methods here and no indication of foreign methods.

3. Rio Grande Valley ceremonial rooms are distinctive, and kivas, as developed further west, do not appear here until late in the 14th century. This is true north of Frijoles Canyon; south of Frijoles there is probably a different pattern of ceremonial rooms. A short discussion of the difference follows later in this section.

Culture can move quickly and easily from area to area—masses of people do not. This is particularly true in a region such as the upper Rio Grande Valley where the population must have been living on a barely subsistence level most of the time.

Fortunately I am not alone in feeling that the upper Rio Grande Valley population expansion of the 13th century was a local phenomenon. Schwartz (1977) speaking of his work at Arroyo Hondo described a "population explosion." Similarly, Dick and his co-
workers (1974) saw no influx of foreign elements in the long stratigraphic sequence at Picuris.

One is tempted to say “Let those San Juan fellows stay in the west where they belong.” This is a digression, but my feeling is that the San Juan (Mesa Verde) culture was westward facing, the people were closely tied to those of the Colorado Basin, and probably spoke a Shoshonean language. Throughout the disastrous 13th century in the San Juan, the Anasazi population shrank drastically and there was apparently a flow of small groups into the Lukachukai-Chuska Mountain region and to the perennial streams that flow to the Colorado River from the east. By the end of the century there must have been few puebloans east of the Chuskas; the people had joined their cousins to the south and west. If my guess as to the language of the Anasazi is correct, we might also look for puebloan remnants among other Shoshonean groups, such as the Southern Utes.

In the same line of thought, I object to the use of the term “Rio Grande Anasazi.” I believe that the people of the Rio Grande had a fine trade relationship with their western neighbors and had no reservations about copying such things as pottery designs from them, but that seems about as far as it went. Rio Grande culture was Mogollon in origin; it was derived mainly from the south and the principal cultural alignment of the people continued in that direction.

As I wrote in the Introduction, I have been careless in my use of the term Pajarito Plateau. I have used it when frequently what I meant was only a part, a small part, of the Plateau—from Pueblo Canyon to Frijoles Mesa. This area is generally conceded to have been occupied by ancestral Tewa (Lange and Riley, 1966) and the large portion of the Plateau from Frijoles Canyon south was Keres country.

In addition to there being a linguistic boundary at Frijoles Canyon, there might easily have been a separation of custom and, to some extent, of material culture.

David Snow of the Museum of New Mexico excavated a site he called Saltbush Pueblo within the Bandelier National Monument headquarters area in 1971 (Snow, 1974). This small site, which yielded Santa Fe Black on White pottery, had a main house block of a double row of rooms, which was aligned north-south. Near those rooms were two others plus a kiva that had been excavated into the soil. The kiva had a southern recess similar to the common feature of kivas in the Mesa Verde development in the San Juan Basin. Not only was this kiva different from anything so far reported from the northern part of the Pajarito Plateau, but dendrochronological and archaeo-magnetic dates at the site are around AD 1200. This is far earlier than any reported kiva from the Los Alamos survey area where kivas seem to have been introduced in the late 14th century.

Near Saltbush Pueblo is Rainbow House. It was dug in 1948-50 by the late Frederick C. V. Worman, and a report of the excavation was prepared by Caywood (1966). An irregular block of 46 rooms formed the main part of the pueblo. South of the block was a plaza and a double row of rooms, of which the long axis ran east-west. At the east side of the plaza was a deep (2.3 m) kiva dug into the soil with the walls faced with masonry. A large ventilator shaft and horizontal tunnel are similar to those of kivas at Tyuonyi, Tsirege, and other kivas north of Frijoles Canyon. Pottery from the site is late—Biscuit wares and glaze paint wares.

At the southern edge of Bandelier, Hubbell and Traylor (Hubbell and Traylor, in press) excavated two sites that can be compared to the ruins in the Los Alamos area. LA 12119 was an irregular block of rooms with three kivas and an extension to the east that consisted of six rooms in a row. The kivas are of particular interest.

Kiva 1 was similar to that at Saltbush Pueblo; it had a southern recess, as well as a ventilator shaft and tunnel.

Kiva 2 was similar to the ceremonial rooms north of Frijoles Canyon, except that its curved wall faced southwest and it had a sipapu.

Kiva 3 was roughly circular and it had a ventilator shaft and tunnel on the east side.

LA 12121 was a double row of rooms (seven rooms) for which the long axis ran east-west and the site had one rectangular kiva. Painted pottery at each of these sites was preponderately Santa Fe Black on White (for LA 12119, 83% and at LA 12121, 68%).

It can easily be seen that the pattern of construction in the Los Alamos portion of the Plateau varies widely from that in Frijoles and Alamo Canyons. The unanswered question is whether ceremonial life also differed between the two areas. It must be remembered though that the northern pattern is based on excavations at 27 sites dug between 1950 and the present, while only 4 sites contributed information for the southern part of the Plateau. At this time it appears that there was a significant cultural boundary at Frijoles Canyon. The National Park Service is planning an intensive archaeological study of Bandelier National Monument and, at the end of that job, we should have a clearer picture of pre-Columbian life in the area.
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APPENDIX A

ONE STEP IN THE SEARCH FOR PUEBLO FIELDS ON MESITA del BUEY

by

Vorsila L. Bohrer

As a pollen analyst, my job was to identify maize pollen in 14 soil samples related to arable land near archaeological pueblo sites on Mesita de Buey, near Los Alamos, New Mexico. Homesteading activity from 1890 to 1920 was common in the vicinity of Los Alamos, but was apparently absent from Mesita del Buey. Margaret Wohlberg of the Los Alamos County Historical Museum can find no record of homesteads or of fields on the mesa. Teralene Foxx, well versed in the habits of plants, could find none that might have indicated farming activity in recent times.

Procedures. The 14 soil samples were extracted by methods described by Mehringer (1967) and mounted in 12,500 centistoke silicon oil. Silicon oil allows the pollen to be rotated when slight pressure is applied to the slide coverslip. The method allows the viewer to alter the position of the grain for further examination or to obtain measurements. Since fossilized maize pollen is frequently collapsed or crumpled in such a way to obscure the diagnostic pore, the mounting medium greatly enhances the opportunity to obtain a reliable identification.

In order to provide an estimate of the number of pollen grains encountered in the search for maize pollen, the number of pollen grains on a single transect across the center of the slide was tallied. When using a mechanical stage at 400 power magnification, one can obtain approximately 20 transects across a slide. Thus, the number of grains from a single transect (Table A-I), when multiplied by 20, estimates the number of grains examined on the slide.

I made a number of observations while scanning each microscope slide for maize pollen. In addition to the presence of maize, the occurrence of prickly pear and cattail pollen was also noted (Table A-I). Tallies on the proportion of predominant pollen types were maintained. The maize pollen was measured with an eyepiece micrometer at 400X (Table A-II).

Discussion. All pollen samples were dominated by pine, with values ranging from 81 to 90 per cent. If all pine pollen were ignored, the next most numerous category would be the Chenopodiaceae-Amaranthaceae, or "cheno-ams." This large pollen category includes woody plants like saltbush (Atriplex sp.) and herbaceous annuals like Chenopodium and Amaranthus that tend to invade disturbed ground when moisture is sufficient.

The chance of recovering maize pollen is influenced by a number of variables including the number of years the field was cultivated. The total absolute amount of locally produced maize pollen will depend on the length of time the field was planted. Whatever the amount, the comparatively heavy deposition of pollen from local pines serves to lower the probability of recovering maize pollen. Earthworm activity and water percolating through the soil disperses maize pollen vertically in the sediment (Walch et al., 1970), and an unknown amount will be lost through degradation. Consequently, the presence of maize pollen in potential field contexts tells more about probable land utilization than does the percentage of maize pollen present.

The two maize grains described in Table A-II seem normal for maize deriving from Southwestern archaeological sites. The maize from transect 1 was slightly crumpled, but I would judge the diameter to be at least 60 microns. Some maize pollen can have diameters as much as 100 microns. These large diameters are not known to be typical of any native grass. The large size of the pore and annulus is commensurate with the size of the grain. The smaller diameter maize pollen might be confused with cereal pollens such as wheat or barley, but these are Old World introductions.

Insect pollinated prickly pear cactus grains, though rare, are typically recovered from modern surface samples taken where the cacti grow. If Mesita del Buey is now heavily overgrown with trees, the presence of this pollen may indicate former sunny, open areas where the cactus once grew.
The presence of cattail (Typha) pollen is not easily interpreted. The tetrads of pollen are relatively heavy for a wind-pollinated plant. The single station recording cattail pollen on the San Augustin Plains was one where the cattail grew (Potter and Rowley 1960:20). Modern surface samples at the archaeological site of Arroyo Hondo reveal no cattail pollen in 600 grains, even though a small stand grows upwind in the nearby canyon (Bohrer, unpublished). Without seeing the site and learning where modern cattail habitats are in relation to modern surface soil samples, the variables of canyon updrafts and other transport factors can not be well evaluated. The possibility of former reservoirs on the mesa top should be considered as providing a habitat for cattail.

Bibliography


**TABLE A-1**

**POLLEN**

<table>
<thead>
<tr>
<th>Provenience</th>
<th>Maize</th>
<th>Prickly Pear</th>
<th>Cattail (Typha)</th>
<th>Number of Pollen Grains in 1 Transect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transect 1, Station A</td>
<td>x</td>
<td></td>
<td>x</td>
<td>80</td>
</tr>
<tr>
<td>Transect 1, Station B</td>
<td></td>
<td></td>
<td>x</td>
<td>92</td>
</tr>
<tr>
<td>Transect 1, Station C</td>
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<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Transect 1, Station D</td>
<td>x</td>
<td>x</td>
<td></td>
<td>35</td>
</tr>
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<td>Transect 1, Station E</td>
<td>x</td>
<td></td>
<td></td>
<td>153</td>
</tr>
<tr>
<td>Transect 1, Station F</td>
<td></td>
<td>x</td>
<td></td>
<td>161</td>
</tr>
<tr>
<td>Transect 1, Station G</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>LA 354, Location A</td>
<td></td>
<td>x</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>LA 354, Location B</td>
<td></td>
<td></td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>LA 12598, Location A</td>
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<td></td>
<td>50</td>
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<td>255</td>
</tr>
<tr>
<td>LA 4629, Test 1</td>
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<td></td>
<td>119</td>
</tr>
<tr>
<td>LA 4629, Test 2</td>
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<td>x</td>
<td></td>
<td>70</td>
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<tr>
<td>LA 4629, Test 3</td>
<td>x</td>
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### TABLE A-II

**POLLEN MEASUREMENTS**

<table>
<thead>
<tr>
<th>Provenience</th>
<th>Minimum Grain Diameter</th>
<th>Annulus Diameter</th>
<th>Pore Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tran. 1, E</td>
<td>58.7</td>
<td>11.5</td>
<td>4.2</td>
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<tr>
<td>LA 4629, Test 2</td>
<td>65.33</td>
<td>12.2</td>
<td>6.1</td>
</tr>
</tbody>
</table>

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**APPENDIX B**

**CONCERNING THE NATURE OF A DEPOSIT ON A SHERD**

by

Vorsila L. Bohrer

A pottery sherd with a deposit of grey friable material containing small charcoal inclusions was submitted by C. R. Steen from LA 4716. It was hoped that additional small pieces of uncharred vegetal material in the matrix might be identified and corroborate an opinion that the deposit was a processed corn product, such as hominy.

Parts which might have been accidentally included in a processed maize produce were secured for comparison. A complete Chapalote maize plant supplied examples of the husk surrounding the ears, the silk, and the chaff that clings to either the kernel or the cob. Studies relating to the diagnostic features of the maize epidermis and kernel pericarp were obtained.

Part I. Plant fragments from the matrix on the sherd were removed with the aid of a sharp dissecting needle and jeweler’s tweezers and then heated in boiling water bath to remove air from the tissue and release debris clinging to the surface. The fragments were stained with Safranin “O” in a watch glass and transferred to a “Karo” mounting medium (a corn syrup product with maple flavoring and sodium benzoate added). Some of the scrapings from the sherd deposit were placed in water and a drop of tincture of iodine was added as a test for starch. As a comparison, a similar test was performed on the starchy interior of popped corn. Results were checked visually and under the microscope.

At the interface between the matrix and the pottery sherd, minute branched structures were examined microscopically to verify they were rootlets. When stained, the vessel elements could be discerned in a continuous line, which verified the presence of water conducting tissue. Other botanical samples, which bore no immediate resemblance to rootlets, were obtained from the central area of the sherd deposit. Individual cells with helical or scalariform pitting were discernible, sometimes in continuous lines. Such cells are characteristic of xylem or water conducting tissue. On some fragments of single celled root hairs were visible on the epidermis. No similar comparative cellular structures could be found on the leaf epidermis, husk, silk, or the chaff of the comparative maize samples, which lack veins for water and nutrient conduction. A few fibers were recovered at the interface of the sherd and the deposit. The long tapering form resembled fiber of monocotyledons (i.e., Yucca sp.) and may pertain to one of the former uses of the vessel. The
scrapings from the sherd matrix did not turn blue or black from contact with the tincture of iodine, as one might expect of starch. When viewed microscopically the material exhibited ragged edges, in contrast to the round form of the starch granules in popcorn.

The deposit on the sherd does not appear to be starchy in nature as might be expected of a corn product. It is penetrated repeatedly by extremely fine root hairs, which reach their best development at the juncture with the sherd.

Part II. Pieces of matrix clinging to the sherd were removed with tweezers and placed in a watch glass to which a 10% solution of hydrochloric acid was added. This was further diluted with water from an eyedropper until the reaction visibly slowed. Afterwards the acid was decanted and water added to the watch glass. Particles which appeared to be plant material under a dissecting microscope were transferred with an eyedropper to a watch glass containing fresh water. After Safranin "O" was added to stain cutinized or lignified cell walls (Sass 1951:60) the particles were transferred to a drop of Karo syrup on a microscope slide and a cover slip added. One set of extracted particles was left overnight in a weak Safranin O solution and mounted in Karo the following morning.

A fragment of plant material composed of long narrow cells darkened differentially to create a striped pattern. This represents the only fragment that bears any similarity to the pericarp of a maize kernel. Due to the degradation in the prehistoric material and the natural cellular compression in modern mature maize pericarp (Kiesselbach and Walker 1952:605) the comparison is only a generalized one. A fragment of material that absorbed safranin stain was noted, but nothing more could be concluded beyond the fact that it represented plant material. This and other particles are badly corroded with surfaces obscured by particulate matter. Only a clump of rootlets could be discerned easily.

Bibliography


