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Archeological Salvage Excavations
on the Mesita del Buey,
Los Alamos County, New Mexico

UNITED STATES
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Archeological Salvage Excavations
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Los Alamos County, New Mexico

by

Frederick C. V. Worman

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ABSTRACT

This publication is the first of a series of reports concerned with salvage archeological excavations from the portion of Los Alamos County, New Mexico, occupied by the Los Alamos Scientific Laboratory.

Excavation of four sites on the Mesita del Buey, including research procedures, and site descriptions, artifactual analysis, and the reconstruction of events in the area, are discussed.

ACKNOWLEDGMENTS

As archeologist-in-charge, I wish to express my appreciation to all who helped in the progress of the work. This list must include Norris E. Bradbury, Director of the Los Alamos Scientific Laboratory, and Dr. Thomas L. Shipman, Health Division Leader, who made it possible for me to have the time required to excavate the sites, and who have shown a continuing interest in archeology at Los Alamos. I wish to thank Dr. Jesse L. Nusbaum for his efforts in expediting the necessary permits as well as for his technical advice. Valuable additions to the report are maps of the excavated sites prepared by members of LASL Engineering Group 3 and Carl Cuntz of Group H-8, and the fine photography by Victor Stevenson of the LASL Photo Group. I appreciate the assistance of the late Stanley Stubbs of the Laboratory of Anthropology (Museum of New Mexico), in Santa Fe, in the classification of some of the pottery types. Very deserving of recognition is Dr. A. E. Dittert of the Museum of New Mexico for his perusal of this manuscript and comments thereon. Last but far from least, I especially wish to thank Laura J. Shreffler, Group H-8 secretary, for typing the manuscript, and LASL Group D-6 for editing and preparing the paper for publication.

INTRODUCTION

An examination of early archeological endeavors on the Pajarito Plateau calls to mind such outstanding names as N. C. Nelson,^{1,2} A. F. Bandelier,^{3,4} C. F. Lummis, E. L. Hewett,⁵⁻⁹ J. L. Nusbaum, K. M. Chapman, J. P. Harrington, and A. V. Kidder,¹⁰ who worked in the period extending from 1880 to the late 1930's. Their efforts were joined or continued during the 1930's and 1940's by H. P. Mera,¹¹⁻¹³ W. S. Stallings,¹⁴ J. Fulton, J. W. Hendron,¹⁵ and S. G. Morley.¹⁶ Since 1950 some sporadic excavations and the writing from data on early reports have been carried on by J. F. Turney, R. Lister, L. R. Caywood, and F. C. V. Worman. Early archeological interest centered on the major sites of the Pajarito Plateau such as Tyuonyi, Kastiatsi, Navawi, Tsankawi, Tsirege, Otowi, and Puye. Little attention has been given to the small-house Pueblo III sites which are so abundant on the mesa tops of the plateau, especially on the old Ramon Vigil Grant where many of the Los Alamos Scientific Laboratory technical areas are located. An unpublished survey of the grant, which located many of the ruins, was made by J. Fulton for the National Park Service in 1935. Additional sites have been located by the LASL Engineering Department during their surveys for new maps of the area. The Los Alamos Archeological Society has made recent excavations of a small-house site near White Rock and a talus house in Pajarito Canyon west of Tsirege. The author has been interested in this area since 1948 and a series of reports, beginning with this one, on completed salvage archeology will attempt to increase the knowledge of this relatively little-examined area.

This report is the result of a cooperative archeological project arising from an agreement between the Los Alamos Scientific Laboratory, the U. S. Atomic Energy Commission, and the U.S. Department of the Interior. It is the desire of the participating agencies to obtain all possible information from archeological sites. It is the policy of the Los Alamos Scientific Laboratory and the Atomic Energy Commission to cooperate fully with the regulations specified by the Antiquities Act of 1906 and the Historical Sites Act of 1935, not only in adherence to federal law, but also as a matter of general scientific interest. The

technical areas of the Laboratory are located in a region rich in archeological sites and materials. Because such areas are, of necessity, placed under rigid restrictions, there is an obligation to bring to light any available archeological knowledge. This interest in the importance of such resources has caused the salvage of sites to be included as an integral part of the construction program.

It recently became apparent that the Laboratory required more space for the disposal of contaminated materials. These materials are disposed of in large pits that are 600 feet long, 100 feet wide, and 25 feet deep. The Mesita del Buey satisfied the requirements of geological structure and space for a number of pits, and the top surface was set aside as a long-range burial pit area. With site salvage in mind, the ruins on the Mesita were visited on January 23, 1957. The inspection group consisted of Dr. Jesse L. Nusbaum, then Consulting Archeologist for the Department of the Interior; John Sizer and Ben Williams, LASL Engineering Group 3; John Abrams, U. S. Geological Survey; and the writer. Sites were located, by numbers, by reference to the 100-foot contour map of the Ramon Vigil Grant, prepared by J. Fulton in 1935. Engineering Group 3 of the Laboratory has since prepared 2-foot contour maps of the area which include additional sites overlooked by the Fulton survey. The site numbers assigned by Fulton were revised, using Laboratory of Anthropology (LA) numbers from a block assigned to LASL by the Museum of New Mexico; they are now part of the state archeological survey.

Request for permission to excavate ruins in the path of construction, under the Rules and Regulations of the Antiquities Act, was made to the Department of the Interior on February 21, 1957. Permission was granted on March 6 and excavations were begun on March 11. The archeological excavations were directly supervised by the writer. Labor and tools for the work were supplied by the Zia Company, operating and maintenance contractor for LASL. Labor included three laborers, a foreman, and a truck driver. A preliminary report on the sites covered in this paper was published in February 1959.¹⁷

The Mesita del Buey is a long, rather narrow mesa running from west to east on the Pajarito Plateau. The mesa lies between the Cañada del Buey on the north and Pajarito Canyon on the south. The mesa top varies from elevations of 6,900 feet at the west end to 6,600 feet at the east end, at the location of the well-known Tsirege Ruin. The elevations of the mesa top drop more rapidly than those in the canyon, resulting in a mesa height which varies from well over 100 feet above the canyon floor at the west end to less than 50 feet at the east end. Structurally, the Mesita del Buey is one of the numerous mesas which have been formed by alluvial action in the soft rhyolitic Bandelier Tuff on the east flank of the Jemez Mountains. This formation was laid down during the Pleistocene Period as a result of the volcanic activity that formed the Jemez Caldera.

DESCRIPTION OF SITES

During the course of the project, three ruins

were completely and one partially excavated. Standard excavation methods were used so far as possible within the time allowed. The main digression was the elimination of screening the fill. Exploratory trenches were dug to establish the outer limits of the ruins. Excavation was by rooms, which were numbered consecutively in the order of removal. All materials were placed in bags and identified with date, site number, and room number. Photographs were taken before and after excavation and features were photographed as they appeared during the progress of the excavation. All ruins were mapped at the completion of the work. A pottery analysis was made for each ruin. Lithic and other nonceramic materials were classified according to type, described, and identified with the LA (Laboratory of Anthropology) site number.

Site #192, LA-4633

Site LA-4633 was a small, long, narrow ruin containing three rooms. There was no mound (Fig. 1). The long axis of the site pointed 15°

Fig. 1. Site LA-4633 before excavation.

east of magnetic north. It was located on the Mesita del Buey at an elevation of 6665 feet, at point S.80 + 90 and E.285 + 50 on the Los Alamos Grid map, on which the letters and numbers represent direction and distances in hundreds of feet from the datum point. Corresponding locations on standard maps would be $35^{\circ}39'47''$ north latitude by $106^{\circ}14'1''$ west longitude. A map of the area with range, township, and section designations is in preparation.

Vegetation on the ruin surface consisted of bunch grass; there were piñon trees to the north and east outside of the site boundaries. LA-4633 lay about 2000 feet west of Tsirege Ruin, but not enough artifactual materials were found to make any comparison.

Only a few building stones and a marker, left by the Fulton survey in 1935, gave evidence of its presence. This site lay on a flat area of the mesa top within the boundary of the first burial pit for contaminated materials. Excavation was extremely shallow as only the first course of masonry remained. Building stones were laid sidewise instead of end to end, giving no indication that the masonry was laid as a foundation for adobe walls or other stones. The overall depth of the fill was only 6 inches. An exploratory pit in the northwest corner of Room 1 indicated an average of 8 inches of soil from below the wall bottoms to the top of a slanted bedrock layer of volcanic tuff. Evidently enough soil was added and packed to make a level floor surface. No floor structure was located. No plaster was found on the low walls nor was there any indication that a plastered roof had ever existed. Lack of plaster or fallen building stones and the scarcity of pottery (only three sherds) indicated an outlying ramada type of structure or possible abandonment before the structure was completed for occupation (Fig. 2). The symmetry of this site is amazingly true.

Site #193, LA-4632

Site LA-4632 was located at S.80 + 90 and E.285 + 50 on the Los Alamos grid at a distance of 750 feet along a magnetic bearing of 21° NNE of LA-4633.

This site was the largest site to be excavated

LA-4633

Fig. 2. Map of Site LA-4633.

so far on the Mesita del Buey, consisting of 20 rooms and a kiva. The ruin mound was 28 feet wide and 80 feet long with the long axis oriented from southwest to northeast. The mound was well covered with chamisa (*Chrysothamnus nauseosus*), snakeweed (*Gutierrezia sarothrae*), and prickly pear cactus (*Opuntia sp.*), but was devoid of trees. The surrounding forest, of piñon (*Pinus edulis*), juniper (*Juniperus monosperma*), and scrub oak (*Quercus gambelii*), was so dense that it was necessary for a bulldozer to clear an area around the ruin to permit the operation of trucks and dumping of excavated soil.

This was the most interesting site excavated. The fairly high mound indicated walls about 30

Fig. 3. Site LA-4632 before excavation.

Fig. 4. Detail of wall and original plaster, LA-4632.

inches high in the center of the ruin (Fig. 3). Tuff block walls with adobe mortar were in good condition (Fig. 4), and architectural features were abundant. Several good, black plastered floors were encountered.

The outstanding feature was the semi-sub-

terranean kiva attached to the east side of the building. The kiva started as a rectangular structure at the top, but rounding features were built into the four corners to produce a circular structure in the lower portion (Fig. 5). The bottom 18 inches were dug out of solid, soft volcanic tuff.

Fig. 5. Kiva showing rounding elements, double firepit, and deflector, LA-4632.

Fig. 6. Kiva; detail of double firepit, LA-4632.

The kiva was 17.5 feet in diameter at floor level. Interior wall heights were 4 feet 9 inches, 4 feet 9 inches, 4 feet 0 inches, and 4 feet 6 inches in the SE, NE, NW, and SW portions, respectively. A double firepit was located in the center of the east half of the structure (Fig. 6) immediately in front of the ventilator shaft opening (Fig. 7). Intervening between the firepit and shaft was a large deflector *in situ* (Fig. 5). A similar double firepit was found in the ruin at Los Alamos Community Center. A stepped entry (Fig. 8) in the northwest quadrant allowed for entry from

Fig. 7. Kiva; east wall, ventilator shaft and niches, LA-4632.

Fig. 8. Kiva; stepped elements in NW quadrant, LA-4632.

the main portion of the building. The double firepit and the stepped elements are similar to those found recently on the Cochiti Dam salvage operations.¹⁸

A puzzling feature was a vertical groove, in the north wall of the kiva, which had been filled with plaster (Fig. 9). The groove terminated in a hole in the floor, 12 inches deep, which was filled with powdered tuff (Fig. 10). It appeared that groove and hole had been made to accommodate a post, the necessity of which was not apparent (Fig. 11). The question was clarified by A. E. Dittert, who has noted such slots cut in the north walls of kivas in the Acoma region where they are referred to as "kachina niches."¹⁹ In the Acoma area the hole at the bottom of the kachina niche is considered a sipapu. No sipapus of the type found at Frijoles Canyon or as holes in the floor at Mesa Verde have been found in any of

Fig. 9. Kiva; plastered-over kachina niche, LA-4632.

Fig. 10. Kiva; hole at base of kachina niche, LA-4632.

Fig. 11. Kiva; excavated kachina niche in north wall, LA-4632.

the kivas connected with small-house sites on the Pajarito Plateau. The reason for sealing the niche with plaster is not known.

The site also contained three additional firepits in Rooms 5, 6, and 17. Doorways connected Rooms 4 and 9, and Rooms 1 and 8 (Fig. 12). Ventilator holes were located between Rooms 8

and 12, and Rooms 5 and 6 where the hole was directly above a firepit (Fig. 13). Wall heights varied from 12 inches at the outer walls to 30 inches at the center of the site. Rooms were similar in size to other ruins in the area, varying from 6.5×7 feet to 8×12.5 feet. Wall thicknesses averaged 8 inches. The complete excavation is shown in Fig. 14 and a map of the site in Fig. 15.

Fig. 12. Doorway between Rooms 1 and 8, LA-4632.

Fig. 13. Wall ventilator hole and firepit in Room 5, LA-4632.

Fig. 14. Site LA-4632 at completion of excavation.

Fig. 15. Map of Site LA-4632.

Site #194, LA-4631

Site LA-4631 was a long narrow ruin with large rooms (Fig. 16). The orientation was north-south. This site was located at S.72 + 00 and E.284 + 00 on the Los Alamos grid, at a distance of 750 feet due north of LA-4633. The excavation had a maximum width of 20 feet and a length of 46 feet. The ruin consisted of eight rooms with walls averaging 18 to 20 inches high and 8 inches

thick. Only in the northwest corner of Room 7 was any kind of plastered floor encountered. A good firepit in Room 3 (Fig. 17) and a complete culinary olla in Room 7 (Fig. 18) were the outstanding features of this ruin. The olla was located in the southeast corner of the room; the vessel was buried in the subfloor with the rim top at floor level. Wall construction was much poorer than in LA-4632. The complete excavation and map are shown in Figs. 19 and 20.

Fig. 16. Site LA-4631 before excavation.

Fig. 17. Detail of firepit in Room 3, LA-4631.

Fig. 18. Rio Grande Corrugated olla from Room 7, LA-4631.

Fig. 19. Site LA-4631 after excavation.

Fig. 20. Map of Site LA-4631.

Site #197A, LA-4628

Site LA-4628 was located at S.69 + 50 and E.266 + 80 on the Los Alamos grid, at a distance of 2250 feet on a compass bearing of 300° WNW of LA-4633. The orientation of the main axis was 15° east of magnetic north. This ruin appeared as a mound, the center of which was approximately 4 feet above the surrounding terrain (Fig. 21), about 50 feet in width and 75 feet in length. There was a fair amount of rubble on the mound. Plant growth consisted of cactus, chamisa, and bunch grass. There were no trees on the mound, but surrounding it were piñon and juniper.

Unfortunately, this site was located on the survey line of a new road required for access to the proposed burial pits for disposing of contaminated material. The excavation had to be made quickly because of the imminent arrival of the road building equipment. Therefore, I decided to excavate only the north half of the site to clear the road right-of-way. The south half would remain unexcavated or be examined in the future when sufficient time was available and when other sites required excavation in the area.

As no wall tops were visible, an exploratory

trench 3 feet wide was started from north to south at the north side of the mound. The first east-west wall appeared at a distance of 24 feet from the beginning of the trench. From that point, excavation was continued by rooms. No good floors were found and excavation was continued to a point at or below the wall bottoms where sterile soil was reached. Wall heights averaged 16 inches at the center of the ruin, with an additional 6 inches of soil above the walls. Seven rooms were excavated and tests were made for others in the north half. Because of the paucity of artifactual materials and lack of time, the ruin was regarded as a unit and the pottery analysis does not show a separation by rooms. The most interesting feature of the site was three outer rooms on the east side of the structure. Room 1 had a curved wall in the northeast corner. Room 2 contained a small firepit along the east wall. Room 3 had a curved wall on the east side which did not continue to the south wall of Room 2, resulting in an opening from outdoors into Room 3. This room also had a firepit along the north wall and a storage bin in the southwest corner. The construction indicated that Room 3 was probably a ramada-type workroom off the plaza. Room 4 contained a large storage bin (Fig. 22). Portions

Fig. 21. Site LA-4628 before excavation.

Fig. 22. Storage bin in Room 4, LA-4628.

Fig. 23. Completed excavation of north half of LA-4628.

of floor that were examined were in extremely poor condition and had been smashed by fallen walls and the roof; roof plaster was, in turn, mixed with fragmentary floor plaster. Walls were in good condition with plaster intact in places. The completed excavation and map are depicted in Figs. 23 and 24.

POTTERY ANALYSIS

The only complete pottery specimen was from LA-4631, Room 7. It was a gray Rio Grande Corrugated olla (Fig. 18). The height is 23.5 cm, rim diameter 14.8 cm, maximum width 24.0 cm, and neck diameter 14.0 cm; the bottom is rounded.

Other pottery types, including nonlocal wares, are shown in Table I.

Fig. 24. Map of excavated portion of Site LA-4628.

Table I. Sherd Summary — Mesita del Buey Sites

LOCAL WARES

TRADE WARES

PROVENIENCE	LOCAL WARES					TRADE WARES							TOTAL TRADE SHERDS	TOTAL SHERDS
	TYPE	Santa Fe Black-on-white Typical	Santa Fe Black-on-white Exterior slipped	Santa Fe Black-on-white Ext. decorated	Wiyó Black-on-white	Utility ware	TOTAL LOCAL SHERDS	St. Johns Polychrome	Wingate Black-on-red	North Plains Polychrome	Mancos Black-on-white	Unidentified Polychrome		
LA-4633														
Total site		1			1	1	3						0	3
LA-4632														
Surface		5			3	5	13						0	13
Room 1 Fill		6			10	40	56						0	56
Room 1 Floor		1				8	9						0	9
Room 2 Fill		29			20	85	134						0	134
Room 2 Floor		2			1	28	31						0	31
Room 3 Fill		6			5	93	104						0	104
Room 3 Floor						23	23	1					1	24
Room 4 Fill		4			10	58	72						0	72
Room 4 Floor		4				15	19						0	19
Room 5 Fill		3			6	43	52					1	1	53
Room 5 Floor		5			2		7						0	7
Room 6		37	2		28	60	127						0	127
Room 7 Fill		9			5	28	42						0	42
Room 7 Floor		1				22	23						0	23
Room 8		4			2	45	51						0	51
Room 9		5		1		8	14						0	14
Room 10 Fill		7			19	74	100						0	100
Room 10 Floor		9			11	32	52						0	52
Room 11 Fill		8			1	23	32				1		1	33
Room 11 Floor		7			3	10	20				1		1	21
Room 12 Fill		6			3	35	44	2					2	46
Room 12 Floor		4				21	25						0	25
Room 13		4			2	7	13			2			2	15
Room 14		7			7	9	23	2		1			3	26
Room 15		19			12	57	88						0	88
Room 16		9			10	7	26						0	26
Room 17		3				36	39						0	39
Room 18		3			3	36	42						0	42
Room 19		12			1	14	27						0	27
Room 20		2				30	32						0	32
Room 21		6			3	66	75						0	75
West trench		15			5	28	48						0	48
LA-4632														
Total Sherds		242	2	1	172	1046	1463	5	0	3	2	1	11	1474

Table I. Continued.

PROVENIENCE	TYPE	LOCAL WARES					TRADE WARES						
		Santa Fe Black-on-white Typical	Santa Fe Black-on-white Exterior slipped	Santa Fe Black-on-white Ext. decorated	Wiyo Black-on-white	Utility ware	TOTAL LOCAL SHERDS	St. Johns Polychrome	Wingate Black-on-red	North Plains Polychrome	Mancos Black-on-white Unidentified Polychrome	TOTAL TRADE SHERDS	TOTAL SHERDS
LA-4631													
Room 1		7	4	2	1	19	33					0	33
Room 2		8				6	14					0	14
Room 3		4				4	8					0	8
Room 4		7			1	13	21					0	21
Room 5		1			1	14	16					0	16
Room 6		2	1	2		21	26					0	26
Room 7		5				43	48			1		1	49
Room 8		10				5	15					0	15
LA-4631													
Total Sherds		44	5	4	3	125	181			1		1	182
LA-4628													
Surface		13	2	2	2	9	28		2			2	30
North trench		30	1	1	2	65	99				2	2	101
Fill-total		32	2		3	30	67					0	67
LA-4628													
Total Sherds		75	5	3	7	104	194		2		2	4	198

Analysis of decorated sherds of local origin indicates the following percentages.

	Santa Fe Black-on-white	Wiyo Black-on-white
LA-4628	92.22%	7.78%
LA-4631	96.64%	5.36%
LA-4632	58.75%	41.25%

Percentages from sites LA-4628, LA-4631, and LA-4632 would indicate abandonment of LA-4628 and LA-4631 at about the beginning of the Santa Fe-Wiyo transition, around A. D. 1350, while the larger LA-4632 had a continued occupation well into the Wiyo period. One Wiyo Black-on-white specimen from LA-4632 might be classified as Abiquiu Black-on-gray. LA-4633, with only three sherds, is not considered in the analy-

sis. No glaze types were seen. A single Tsankawi Black-on-cream sherd was considered intrusive. As ceramics from other completed excavations of small-house sites are identified, better information should be obtained with more sampling and increased statistical significance.

A few of the more interesting sherd examples are shown in Figs. 25 and 26, where interiors and exteriors of the same specimens are depicted. A brief discussion of each type follows.

A. Unidentified Polychrome.

This sherd was originally classified as Pinna-wa Polychrome, a type which has been dropped from the literature. Harlow believes it to be closely related to the traditions of St. Johns Glaze Polychrome, centering in the Techado-Quemado

Fig. 25. Interior views of selected sherds.

Fig. 26. Exterior views of sherds shown in Fig. 25.

area in the period around A.D. 1250. The red color, as opposed to shades of orange, suggests influence from North Plains Polychrome. It probably influenced development of the later Kwakina Polychrome in the Zuni area, but the designs are distinctively different. The partial glaze virtually proves the origin as no earlier than A.D. 1250, but the design and rim shape preclude a date much later than circa A. D. 1250.²⁰ The characteristics of this particular sherd appear to be closely related to the Houck-Querino tradition along the Arizona Rio Puerco. The similarity of its design elements to North Plains Black-on-red (see B below) is apparent. It seems best not to attempt to identify this type at the present time. While it appears that this type needs a name, it should be supplied by someone with considerably more material.

B. North Plains Black-on-red.

This is a newly named type, similar to and possibly a successor of Wingate Black-on-red, but it differs in having a brighter red surface color and micaceous paste.

C. Santa Fe Black-on-white.

Honea considers this type a Pajarito variety of Santa Fe Black-on-white; it differs from the typical ware in having a thin wash on the exterior surface. The Peralta variety, in which the interior slip continues over the rim to form an exterior band, has not been noted in this area of the Pajarito Plateau.²¹

D. Abiquiu Black-on-gray.

Only one example of this type was found. It appears to belong to the transition from Wiyo Black-on-white to Abiquiu Black-on-gray. While the paste and temper are typical of the former, wall thickness, design, and exterior roughness must place it with the latter.

E. Wiyo Black-on-white, Pajarito variant.

The highly-polished, soapy-feeling interior slip separates this ware from the typical Wiyo Black-on-white found on the Pajarito Plateau and in the Rio Grande valley. It is quite common in this area.

F. Mancos Black-on-white.

Mancos Black-on-white ware was found on two of the excavated sites. No date was assigned

to this type by Colton and Hargrave,²² but Catnach²³ places it as probably between A.D. 1000 and 1200.

G. St. Johns Polychrome.

The five sherds from LA-4632 are typical of the descriptions given by Colton and Hargrave²² and Hawley²⁴ who listed dates of A.D. 1100-1200 and 1000-1200, respectively.

H. Rio Grande Corrugated.

This unusual sherd, with an applique on the exterior surface, was identified by the late Stanley Stubbs of the Museum of New Mexico.²⁵

I. Wiyo Black-on-white.

Several black-on-white sherds with a basket-weave type of ribbed exterior have been found in small-house sites. In the opinion of Stubbs, these sherds do not have a Cundiyo-type finish and should be considered indigenous to the plateau rather than to the valley.²⁵

ANALYSIS OF NONCERAMIC ARTIFACTS

Nonceramic materials consisted entirely of lithic or bone artifacts. No datable wood or charcoal was found in any of the sites. Many chips of chalcedony, obsidian, and basalt were found in the ruins and on the surface of the ground.

A good area for obtaining stream channel gravels for artifactual materials could be the Puye gravel beds which outcrop near Totavi at the base of the Pajarito Plateau, or from the Rio Grande. The Puye gravels are made up of mostly Chicoma granite metamorphics of Pre-Cambrian origin.²⁶ Basalt was available from the Cerro del Rio lava flow which lines the lower portion of White Rock Canyon of the Rio Grande. Obsidian may be found in large nodules in Alamo Canyon from pre-Bandelier volcanics. Tuff is available anywhere. Chalcedony (quartz) nodules are found on the Pajarito Plateau, but good working materials must have been transported for some distance. Northrup lists only twelve minerals from Los Alamos County, with quartz, tridymite, and cristobalite as the only silicates.²⁷

A summary of nonceramic artifacts is given in Table II which includes citations to photographs of the artifacts.

Table II. Description and Provenience of Nonceramic Artifacts from Mesita del Buey Sites.

Figure	Provenience	Type of Artifact	Material	Dimensions (cm)		
LA-4632						
27-A	Room 1	Pipe — partial	Clay	4.8	2.1	1.5
27-B	Room 1	Pipe	Clay	5.9	2.6	1.5
27-C	Room 1	Splinter spatula	Bone — deer	14.9	2.2	1.2
27-D	Room 4	Awl	Bone — deer	6.2	1.7	1.2
27-E	Room 5	Awl	Bone — deer	15.1	1.1	0.5
27-G	Room 19	Awl	Bone — turkey	12.9	0.8	0.5
28-A	Room 10	Charm	Chert	8.8	3.6	3.3
28-B	Trench	Projectile point	Obsidian	3.0	1.6	0.3
28-C	Room 10	Projectile point	Obsidian	3.0	1.5	0.6
28-D	Room 12	Projectile point	Obsidian	3.1	1.2	0.3
29	Room 2	Deflector	Fine basalt	65.6	45.4	4.7
30-A	Room 8	Mano — bifacial	Coarse-grained basalt	27.3	12.8	3.9
30-B	Room 1	Mano — bifacial triangular in cross section	Sandstone	26.6	10.8	2.4
30-C	Room 1	Mano — bifacial triangular in cross section	Fine-grained vesicular basalt	25.3	8.3	2.8
30-D	Trench W of Room 9	Mano — bifacial some taper	Medium-grained vesicular basalt	20.8	12.1	4.2
30-E	Room 1	Mano — unifacial	Sandstone	19.2	11.6	3.3
30-F	Room 5	Mano — unifacial	Medium-grained vesicular basalt	19.7	12.2	4.0
30-G	Trench W of Room 11	Mano — unifacial red ochre stain on flat side	Sandstone	15.5	10.9	3.1
30-H	Room 10	Mano — bifacial some taper	Medium-grained vesicular basalt	20.6	11.7	2.9
30-I	Room 8	Mano — unifacial	Medium-grained vesicular basalt	19.1	11.8	3.9
30-J	Room 9	Mano — unifacial	Medium-grained vesicular basalt	19.0	13.4	4.5
30-K	Room 7	Mano — unifacial	Granitic shale	21.2	12.6	2.4
30-L	Room 13	Mano — unifacial	Coarse-grained vesicular basalt	22.3	12.5	3.4
31-A	Room 20	Mano — bifacial	Fine-grained vesicular basalt	21.6	11.5	3.5
31-B	Room 20	Mano — unifacial, partial	Medium-grained vesicular basalt	17.7	12.5	4.9

Table II. Continued.

<i>Figure</i>	<i>Provenience</i>	<i>Type of Artifact</i>	<i>Material</i>	<i>Dimensions (cm)</i>		
31-C	Room 18	Mano — unifacial	Coarse-grained vesicular basalt	22.2	12.0	5.7
31-D	Room 20	Hammerstone — mano, bifacial, side ochre-stained, ends pitted	Conglomerate river gravel	20.9	11.6	4.3
31-E	Room 10	Mano — bifacial	Fine-grained vesicular basalt	19.3	11.7	4.9
31-F	Room 10	Mano — bifacial kidney shaped	Sandstone	22.4	11.7	5.4
31-G	Trench W of Room 9	Mano — bifacial	Fine-grained vesicular basalt	26.2	11.9	7.4
31-H	Room 10	Mano — bifacial	Sandstone	20.4	14.4	2.5
31-I	Room 10	Mano — bifacial	Medium-grained vesicular basalt	21.1	12.2	5.6
31-J	Room 11	Mano — bifacial	Sandstone	21.9	10.7	3.6
31-K	Room 18	Handstone — unifacial	River gravel	27.2	14.9	7.1
31-L	Room 16	Polisher — unifacial	Sandstone	6.3	5.1	1.9
32-A	Room 7	Hammerstone	Chalcedony	5.9	—	4.4
32-B	Room 14	Hammerstone	Chalcedony	6.2	—	3.7
32-C	Room 13	Hammerstone	Chalcedony	5.5	—	4.6
32-D	Room 2	Hammerstone	Chalcedony	6.0	—	3.5
32-E	Room 14	Hammerstone	Chalcedony	6.4	—	5.6
32-F	Room 20	Hammerstone	Chalcedony	7.6	—	7.4
32-G	Room 15	Hammerstone	Chalcedony	5.2	—	4.0
32-H	Room 2	Handstone	River gravel	10.2	8.9	5.8
32-I	Room 7	Handstone	River gravel	13.8	11.5	6.2
32-J	Room 16	Handstone, one rough edge	River gravel	11.2	9.2	5.5
33-A	Room 4	Axe — rough	Fine-grained basalt	22.9	12.0	4.1
33-B	Room 5	Maul — smooth	Conglomerate river gravel	16.9	11.5	4.4
33-C	Room 7	Maul	Conglomerate	12.4	6.8	4.7
33-D	Room 21	Axe — partial	Conglomerate	10.3	6.2	3.6
33-E	Room 21	Axe — partial	Fine-grained vesicular basalt	12.1	9.4	2.2
33-F	Room 21	Axe	Fine-grained basalt	11.6	7.2	3.9
33-G	Room 19	Axe	Ground mass of aphanitic granite with inclusions of quartz, rhyolite, cinnabar, and azurite	15.5	7.9	4.7

Table II. Continued.

<i>Figure</i>	<i>Provenience</i>	<i>Type of Artifact</i>	<i>Material</i>	<i>Dimensions (cm)</i>		
33-H	Room 20	Axe	River gravel	12.0	8.0	3.1
33-I	Room 21	Axe	Sandstone shale	12.4	7.8	2.3
34-A	Room 1	Ventilator plug	Volcanic tuff	21.6	12.4	7.7
34-B	Room 17	Ventilator plug	Volcanic tuff	20.5	15.3	10.7
34-C	Room 20	Ventilator plug	Volcanic tuff	21.6	12.7	9.2
34-E	Room 15	Ventilator plug	Mud plaster	14.6	11.2	9.2
34-F	Room 20	Ventilator plug	Volcanic tuff	14.8	11.8	11.8
34-G	Room 15	Ventilator plug	Volcanic tuff	13.7	9.8	7.4
35	Room 2	Metate	Medium-grained vesicular basalt	46.7	33.8	8.5
36-B	Room 18	Metate — tapered at thin end to 4.1 cm	Volcanic tuff	42.4	27.6	9.7
LA-4631						
27-F	Room 5	Awl	Bone — deer	13.2	1.5	1.1
28-E	Room 6	Scraper	Chalcedony	9.8	6.0	1.2
34-D	Room 8	Ventilator plug	Volcanic tuff	16.1	13.1	9.3
36-A	Room 2	Metate — rounded base	Sandstone	37.8	21.5	6.2
LA-4628						
37		Mano — unifacial	Medium-grained vesicular basalt	27.3	12.5	3.1
37		Metate — unifacial	Volcanic tuff	51.5	36.0	11.0

Fig. 27. Artifacts from LA-4631 and LA-4632.

Fig. 28. Artifacts from LA-4631 and LA-4632.

Fig. 29. Deflector from kiva, LA-4632.

Fig. 30. Manos from LA-4632.

Fig. 31. Lithic artifacts from LA-4632.

Fig. 32. Lithic artifacts from LA-4632.

Fig. 33. Axes and mauls from LA-4632.

Fig. 34. Ventilator plugs from LA-4631 and LA-4632.

Fig. 35. Metate from Room 2, LA-4632.

Fig. 36. Metates from LA-4631 and LA-4632.

Fig. 37. Mano and metate from LA-4628.

CONCLUSIONS

The four excavated sites were similar to the hundreds of other small-house, black-on-white pottery sites, which belonged to the Pueblo III period with occupation dates of about A.D. 1150 to before 1350 when the transition from Wiyo Black-on-white to Abiquiu Black-on-gray occurred.²⁸ These small structures were described by Hewett as outlying buildings of the large sites which dominated the Classical period of Rio Grande archeology.⁵ True, many are small, consisting of one or two rooms and are of the jacal-type structure, but others have 20 to possibly 100 rooms and contain all of the elements which comprise a complete pueblo. Also, the dates are too early for complete contemporaneity with the large pueblos.

All of the small-house sites are located on mesa tops. The economy was based upon agriculture, which could have been carried on in the canyons, along with some hunting. Water appears to have been available in more abundance than now exists. (Even at present, water flows in Los Alamos Canyon until early summer despite a holding reservoir on the upper part of the stream. The water table remains high enough in Sandia Canyon to maintain a permanent marshy pond. A slight increase in precipitation with a subsequent rise in the water table would change some of the dry stream beds into, at least, intermittent water courses.) No evidence has been found of irrigation systems; crops must have been dry farmed, relying on subsurface moisture.

Abandonment of the small-house pueblos occurred before A.D. 1350. Several causes could have led to the termination of these dwellings. Evidence indicates that at least two different types of peoples occupied the plateau during prehistoric times. There is even the possibility that the area could have been a melting pot for several groups of immigrants from further west. Land area conflicts could have created stresses between the different groups. Several reasons may be considered for the abandonment of these pueblos:

1. The people died out.
2. The economy was threatened by lack of sufficient water and/or severe climatic changes.

3. They were absorbed by the larger communal type pueblos.
4. They moved under some sort of pressure and harassment and established new homes.

These reasons are discussed in order below.

1. Indications are completely contrary to the idea of extinction. That new pueblos were being built and abandoned before completion will be covered in future reports. Actually, the population was increasing and the culture was spreading at the time of abandonment.

2. Water supply was not a problem. Dendrochronological studies, which indicate tree ring widths in percent of growth above or below the average growth, are shown for the following decades.²⁸

Decade	Percent of growth, average
1300-1309	123.6
1310-1319	110.7
1320-1329	94.9
1330-1339	96.5
1340-1349	86.5
1350-1359	117.8

Although the period of abandonment was sufficiently wet to sustain agriculture, a change in temperature could have been a factor. A period of lowered temperatures at high altitudes could have shortened the growing season of the staple squash, beans, and especially maize. The abandoned sites are at an altitude of over 6600 feet. James Schoenwetter's palynological studies at Picuris show good agreement with dendrochronology of the periods shown above. However, the pollen record shows spruce and pine pollens being introduced into the normally juniper-piñon area. This would indicate an encroachment of the Transitional Life Zone into the Upper Sonoran Zone, a phenomenon which could be due only to a period of lower temperatures. The seriousness of the change at high altitude Picuris is further shown by a shift from an agricultural to a hunting economy — a regressive step.²⁹

Although pollen studies have not been made on the small-house sites, such a hypothesis could

be valid for the Pajarito Plateau. Crop failure would have introduced an untenable situation for the sparsely populated small pueblos. Larger pueblos, with their additional manpower, could have met the challenge by introducing such major technological changes as holding reservoirs for early-season irrigation which could have given the crops an earlier start and extended the growing season. Whether or not this hypothesis is true, we do know that the inhabitants of larger pueblos remained until the very serious drought of the early 1500's when they too were forced to abandon their homes.

3. Absorption by the larger communal pueblos and organization into a single cultural group would have brought about drastic changes in the linguistics of the two groups. This is not indicated by the languages that have come down to us with distinct purity.

4. The last reason, pressure and harassment coupled with climatic changes, seems to be the most acceptable. Pressure from other pueblo groups did not occur as a sudden, catastrophic event. Scarcity of easily carried artifacts in all of the sites thus far excavated indicates that withdrawal was gradual, orderly, and not without planning. Pressure from the Navajo may be ruled out, as it is now common knowledge that they did not arrive in this area until shortly before or possibly after the arrival of the Spanish in 1540. Bandelier speaks of skirmishes between the Queres (Keres) and Tekua (Tewa), with a resultant movement of the Keres to the south.³⁰

Pottery studies from the small-house period indicates a general use throughout the area of Santa Fe Black-on-white types, which were in turn followed by Wiyo Black-on-white with a large number of Little Colorado River types present as trade wares. St. Johns Polychrome, Wingate Black-on-red, and North Plains Black-on-red wares are quite abundant on the small sites. The surface of Tsirege, a nearby large communal pueblo, contains many sherds of the Santa Fe and Wiyo types, but they are overshadowed by a multitude of later glaze and black-on-gray specimens. Following the abandonment of the small pueblos, at the close of the Wiyo period, a well-defined pottery sequence is noted in such large Tewa pueblos as Tsankawi, Otowi, Navawi, and Puye. Here, Wiyo Black-on-white was ancestral to the

so-called "biscuit wares," which are better termed Abiquiu Black-on-gray, Bandelier Black-on-gray, Tsankawi Black-on-cream, and Tewa Polychrome.

At the time of the development of the "biscuit wares," a newer and finer glazeware pottery was being introduced to the Rio Grande from its focus in the Acoma-Zuni area. This new, superior, thin-walled pottery gained popularity among the Keresans, probably at Tsirege and certainly along the Rito de los Frijoles at Tyuonyi, Kastiatsi, and in the cliffside talus houses. It was probably here that the small-house people had their renaissance, and glazeware became the predominant pottery of the Keresans. This pottery popularity is shown in the pottery summations by Hendron¹⁵.

Evidence of Keresan affinities among the small-house people is shown in the stepped kiva elements and double firepits similar to those of the Cochiti Dam area, and the presence of the kachina niches described from the Acoma country.

Assuming the small pueblos to be Keresan and the large, more northerly communal dwellings to be Tewa (Tanoan), a dividing line between the two linguistic groups begins to the north of Frijoles Canyon and roughly parallels present State Highway 4 to its junction with the main road to Los Alamos, with the Keres to the west and the Tewas to the east. The area to the north of the Los Alamos road seems to be entirely Tewa.

Later abandonment of the large pueblos, both Keresan and Tewa, and the subsequent movement to the present day pueblos along the Rio Grande and the Jemez River occurred at about the beginning of the historical period.

Keresan tradition, according to my old friend and informant, Crescencio Toribio³¹ of Zia Pueblo, tells of the abandonment of the Frijoles Canyon pueblos along with the rim pueblo of Frijolito and the movement of the people to Yapashi (Pueblo of the Stone Lions), La Cueva Pintada (Painted Cave), and San Miguel; then on to the Pueblo Viejo (Kotyiti); and finally to present day Cochiti. He also noted a reoccupation of Kotyiti during the Pueblo Rebellion. In Bandelier's journals,³⁰ it is mentioned that Kotyiti was occupied by the Cochiti and their allies during the Revolt and Reconquest from 1680 to 1692. The belief of the Keres (especially the Cochiti) that Frijoles Can-

yon was their ancestral home is strong, but not as widely publicized as the claim of the Santa Clara Tewa to old Puye as the habitation of their forefathers.

Considerable work remains to be completed on the Ramon Vigil Grant and the area south of Frijoles Canyon. Further analysis of materials from completed excavations in the Los Alamos area should bring more information to light. As mentioned earlier, archeological interest has been centered on the larger, well-known, named sites on the Pajarito Plateau. Construction of facilities for the Los Alamos Scientific Laboratory engendered interest in the numerous small-house sites to be destroyed, such as the four described in this report.

The following conclusions have been reached through analysis of both large and small sites in this area.

1. The small-house sites were occupied during the Pueblo III period from 1150 to shortly after 1300.
2. The small-house sites antedated the larger communal dwellings.
3. At least two groups of people, Keresan and Tanoan, inhabited the Pajarito Plateau during prehistoric times.
4. The small houses and the later communal sites in Frijoles Canyon were occupied by the Keresan people.
5. Pottery analysis and architectural features indicate that the early Keresans migrated to this area from the Little Colorado River and Zuni-Acoma areas.

Some of the conclusions made here may evoke some disagreement with other archeologists, but when asked, "Where did the Pajaritans come from?" we must have better answers than, "Maybe they were here all the time," or "We have to go along with a Mesa Verde origin." Neither answer is acceptable without question, in the light of additional knowledge. My opinions, as well as some old time-worn ones, may have to change before the complete picture is clear.

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