THE POTTERY OF POTTERY MOUND

A Study of the 1979 UNM Field School Collection, Part 1: Typology and Chronology

By

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Maxwell Museum Technical Series No. 5
University of New Mexico

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Chapter 1

INTRODUCTION

Located on the banks of the Puerco River, roughly 20 km west of Los Lunas, New Mexico (Figure 1), Pottery Mound (LA 416) consists of high mounds that at one time were adobe house blocks. The old pueblo's adobe walls have eroded extensively over the past 500 years. Today, several house mounds remain but no architecture can be seen. Backdirt piles left by previous excavations are evident, as are the erosion and side-cutting caused by a meander of the Puerco River. The ruin is extensive, covering about 3 ha along the bank of the Puerco. During its florescent period, from about A.D. 1325 to as late as 1500 (during the Pueblo IV period), the village may have comprised more than 500 rooms and a population of more than 1,000 (Stuart and Gauthier 1981:154).

Pottery Mound is well-named. Visitors to this large prehistoric Pueblo site are immediately impressed with the quantity of artifacts, primarily ceramics, that litter the surface of the ancient town. More pottery than soil seems to cover the surface, giving it an almost "paved" appearance. Clearly, this was a population center in the late prehistoric Pueblo world. Situated in the Middle Rio Grande cultural province, archaeologically, the town must have played a major role in the Puebloan culture of the region. The abundance and typological variety of ceramic fragments suggests that this village was also a center of pottery production and a node on the exchange networks of the time.

Today, unfortunately, the site is in poor shape. Progressive erosion of the northeast side of the ruin by the Puerco has prompted attempts to reduce the damage. A berm in the drainage bottom, built by the Corps of Engineers some years ago, has helped divert the stream away from the meander that cut into the site. Slumping and side channel erosion continue to threaten the site, however, and archaeological materials are washed away every year. Site monitoring, together with re-mapping the site using new techniques, is now an ongoing project of the Maxwell Museum at the University of New Mexico, which owns the site. Figures 2 through 4 illustrate the physical setting and condition of the site today.

This report will illustrate some of the ways in which this settlement developed, flourished, and passed into history, as seen through its pottery. The report will also demonstrate how this key production locality contributed to the rich tapestry of glazeware ceramics of the times, and participated in a trading network that distributed pottery across a wide expanse of the northern Southwest. The Pueblo IV period (Tables 1 and 2) was previously viewed as a time of decline from a cultural pinnacle in the Pueblo II and III periods (as expressed at Mesa Verde and Chaco Canyon, for example). Since the 1950s, if not before, this assessment has been questioned. Part of the earlier impression was probably due to the widespread use of impermanent adobe architecture during the Pueblo IV period, in contrast with the more impressive sandstone edifices of the San Juan Basin and Four Corners area. But some of the finest examples of Puebloan pottery ever produced derive from the Pueblo IV period. In addition, the potters' art was practiced with a fervor and imagination unequalled at any other time in the Southwest.

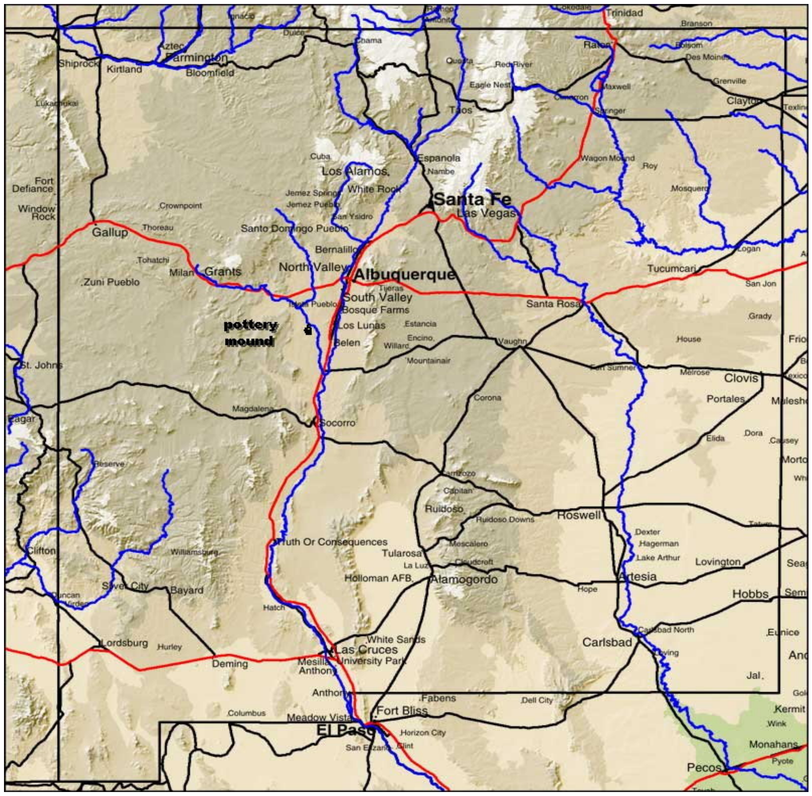

Figure 1. General location of Pottery Mound in New Mexico.

Figure 2. West bank of the Rio Puerco. Hidden Mountain is at right center of photograph.

Figure 3. House mounds at LA 416.

Figure 4. Ceramic and lithic debris on the surface.

Table 1. Major Pottery Types at Pottery Mound, and their Dates.
(From Oppelt 2002 and Wilson 2005)

Types Made at Pottery Mound	
Agua Fria Glaze-on-red	1315–1425
Cieneguilla Glaze-on-yellow	1325–1425
Cieneguilla Glaze Polychrome	1350–1425
San Clemente Glaze Polychrome	1325–1425
Pottery Mound Glaze Polychrome	1400–1490
Rio Grande Plain Gray Utility	1300–1450?
Intrusive (Trade) Rio Grande Glaze Ware	
Middle Rio Grande Glaze A ware	
Los Padillas Polychrome	1300–1315?
Arenal Polychrome	1315–1350?
Galisteo Basin Glaze B ware	
Largo Glaze-on-yellow	1400–1450
Largo Glaze-on-red	1400–1450
Middle Rio Grande Glaze C ware	
Espinoso Glaze Polychrome	1425–1500
Kuaua Glaze Polychrome (in part)	1425–1550?
Middle Rio Grande Glaze D ware	
San Lazaro Glaze Polychrome	1490–1550?
Other Intrusive (Trade) Wares	
Middle Rio Grande, Developmental Period	
Los Lunas Smudged	1200–1325?
Socorro Black-on-white	1050–1300
Clapboard Corrugated	1050–1300
Indented Corrugated	1200–1300?
White Mountain Red Ware	
St. Johns Polychrome	1150–1300
Heshoutauthla Polychrome	1275–1400
Bandelier-Tewa Area	
Biscuit A	1375–1450
Biscuit B	1400–1550
Sankawi Black-on-cream	1500–1600
Rio Chama Area	
Sapawe Micaceous	1400–1500?
Potsuii Incised	1400–1500?
Acoma-Zuni area	
Kwakina Glaze Polychrome	1275–1425
Pinnawa Glaze-on-white	1375–1450
Hopi Area	
Jeddito Black-on-yellow	1350–1450
Sikyatki Polychrome	1400–1625

Table 2. Phases and Glazeware Types of the Pueblo IV Period.
(From Mera (1933), Eighth Southwestern Ceramic Conference (1966), and Oppelt (2002)

Glaze F	Kotyiti Glaze Polychrome	1650–1700
	Kotyiti Glaze-on-yellow	1650–1700
	Kotyiti Glaze-on-red	1650–1700
	Trenaquel Glaze Polychrome	1650–1700?
Glaze E	Puaray Glaze Polychrome	1525–1650
Glaze D	San Lazaro Glaze Polychrome	1490–1515
Glaze C	Kuaua Glaze Polychrome	1450–1525?
	Espinosa Glaze Polychrome	1450–1500
Glaze B	Largo Glaze Polychrome	1400–1450
	Largo Glaze-on-red	1400–1450
	Largo Glaze-on-yellow	1400–1450
Glaze A	Pottery Mound Glaze Polychrome	1400–1490
	San Clemente Glaze Polychrome	1325–1425
	Cieneguilla Glaze-on-yellow	1325–1425
	Cieneguilla Glaze Polychrome	1350–1425
	Agua Fria Glaze-on-red	1315–1425
	Arenal Glaze Polychrome	1315–1350?
	Los Padillas Glaze Polychrome	1300–1315?

The manufacture of huge quantities of pottery not only satisfied the practical needs of the local townsfolk, it formed a vehicle for creative expression and a valued medium of exchange, linking distant pueblos in a complex web. As an expression of artistic ideals, religious iconography and social groups, glazeware pottery played a role beyond its utilitarian aspects (Eckert 2003; Habicht-Mauche et. al. 2006). Pueblo IV pottery art also has ties to kiva art and rock art (Crotty 1995; Hibben 1960, 1975; Schaafsma 1992).

Past studies of Pottery Mound collections have been occasional and fairly narrowly focused. As of 2004, most artifact categories (lithic, faunal, floral, etc.) remained unstudied or understudied. The kiva murals are a noteworthy exception (Hibben 1975). Despite some well-done ceramic studies (Brody 1964, Eckert 2003; Voll 1961), very basic questions remain unanswered about Pottery Mound. What is the exact sequence of types and varieties at the site? Precisely when was it occupied? (Despite the availability of a few tree-ring dates, we still don't know the beginning and especially the ending dates of the occupation.) What materials were gathered and utilized in the production of pottery? What was the nature, extent, and direction of ceramic exchange with other pueblos? Where does Pottery Mound fit into the Pueblo IV world? I hope that the present study will assist in elucidating some aspects of these persistent questions. This first part of my study focuses on the description and illustration of types and varieties, and on their chronological implications.

Previous Investigations

As the scene of archaeological investigations by the UNM field school (supplemented by work funded by the National Science Foundation), the site was partly excavated under the direction of Frank Hibben during the 1950s and early 1960s. Several rooms and kivas were uncovered, perhaps one quarter of the site area. This resulted in an extensive artifact collection (although many sherds were discarded after being typed) and the recording of the murals found in several kivas. These beautiful murals became the focus of attention at the site, and resulted in painstaking drawing and photography. Hibben's 1975 book, *Kiva Art of the Anasazi at Pottery Mound*, documents the mural work. Aside from a couple of short articles by Hibben (1955, 1960), however, the field school efforts went largely unreported. No major, comprehensive analyses of artifacts resulted from the work.

Luckily, however, two of Hibben's students produced M.A. theses drawn from the ceramic materials. The first was by Charles Voll, who in 1961 wrote his thesis on the pottery types found at the site (Voll 1961), their probable placement in the Pueblo IV time framework, and variations in the standard types visible in the excavated materials. Voll's astute comparisons were based on the earlier work of Kidder and Shepard (1936) at Pecos Pueblo and on Mera's studies of the geographic distribution and chronology of the Glazeware types (1933, 1935, 1940). Based on those comparisons, Voll concluded that the site was occupied mainly in Glaze A times, though some Glaze C pottery was also in evidence.

In contrast, Jerry Brody (1964) focused on the decorative and symbolic meaning of the glazeware that was being unearthed. He considered the artistic qualities of the pottery and noted resemblances to contemporary Hopi ceramics.

After his formal excavations, Hibben continued to lead occasional excavations by volunteers until the late 1980s (Hibben 1986). About the same time, Garrett (1976) conducted a petrographic analysis at Pottery Mound. Otherwise the site received little attention until 1979, when UNM returned with a field school crew. Under the direction of Linda Cordell, the crew conducted a stratigraphic test in the refuse in the northeast part of the site (Cordell 1979). (The earlier excavations had cleaned out rooms and kivas, and had opened midden areas in a search for burials, but almost no stratigraphic testing had been done.) To provide a controlled stratigraphic profile, determine the depth of deposits, and assess chronological change, the 1979 crew excavated a 5 by 5 meter pit. Fill removal was in 20 cm levels, which were numbered consecutively from the top, 1–17. Excavation was carried to what was believed to be sterile soil. Artifacts of every category were removed, screened, and bagged by level and quadrant (Cordell 1980b:4). The 1979 excavation yielded the best stratigraphic sample from Pottery Mound—and possibly the only surviving stratigraphic sample—and thus remains the best source of information regarding typological and chronological change at the site. For this reason, I selected the 1979 material for my first analysis of sherds from Pottery Mound. Cordell's proposal (1979), preliminary report (1980b), and recent summary (2004) provide the background to her work.

Suzanne Eckert analyzed several categories of artifacts from the 1979 field school collection for her 2003 dissertation. The pottery and other artifacts were examined in some detail,

providing the only recent analysis before the one described here. Eckert examined sherds for their design motifs, as part of a study of social and ritual meaning across a wide geographical area. Some analysis of pastes and tempers was also undertaken. A stimulating and wide-ranging work, Eckert's dissertation provides insights into pottery and other artifacts as social, cultural and spatial markers. Her study was not designed to refine the typology or chronology of Pottery Mound specifically, however, which is the purpose of my present work.

David Phillips, a curator at the Maxwell Museum, recently organized many of the notes and drawings from the field schools at Pottery Mound. In addition, he is re-mapping the site. Jean Ballagh is writing room-by-room descriptions (Ballagh and Phillips 2006). Their draft research history of the site (Phillips and Ballagh 2004) is especially helpful.

Other sources of information are also available. Early investigations included a preliminary study by Luhrs (1937) on the types of the Puerco. Mera defined most of the pottery types and their geographic distribution, including reports in 1933, 1935, and 1940. Later multi-disciplinary projects on the Lower Puerco include surveys by Wimberley and Eidenbach (1980) and by Eidenbach (1982), including ceramic identification and some technological work by Helene Warren (1982). Earlier work on the technical aspects of glaze pottery of the area include Kidder and Shepard (1936), by Shepard (1942, 1963, 1965), and by Warren (1979), are relevant to Pottery Mound. More recent studies of glazeware-producing pueblos in the vicinity include those by Cordell (1980a) and Franklin (1997). Related work in the vicinity includes research at Hummingbird Pueblo by Southern Methodist University (Adler 2003). Gerow (1998) reported on salvage operations in the Middle Puerco Valley. General summaries of the area's archaeological resources may be found in Marshall and Walt (1984), Stuart and Gauthier (1981), and Eidenbach (1982).

Even so, much basic information on Pottery Mound ceramics is still lacking. After the promising start by Voll and Brody in the 1960s, there was a gap of four decades until Eckert's (2003) synthetic interpretations. Fundamental questions remain. In other words, various studies have "nibbled at the apple" but the "core" remains hidden. What are the beginning and ending dates for site? Was there more than one component? What was the sequence of types, varieties, and rim forms among the glazewares? Questions of "how much" or "where in the site" have not yet been asked. It is the purpose of this project to return to basics, fill in gaps, and provide a sound foundation on which interpretations can be reared. Indeed, some "higher-level" interpretations are best put on hold until "lower-level" issues of typology and chronology are understood. This research will, I hope, help remedy that problem.

Chapter 2

RESEARCH OBJECTIVES AND METHODS

Ever since I visited Pottery Mound with my friend Elizabeth (Betty) Garrett, I intended to study the pottery of this famous site. Following Linda Cordell's UNM field school studies at the site in 1979, Betty and I presented a proposal to Cordell to examine the resulting pottery in order to refine typology, study temporal change in the site, and conduct materials analysis via thin section petrography. Cordell encouraged us to pursue the project, but like so many other good ideas, it was "shelved" when other, more pressing matters intervened. Betty succeeded in preparing petrographic thin sections, and published a short article (Garrett 1976). Unfortunately, she passed away before we could complete any analysis or write-up.

After retiring from teaching computer programming in 2005, I again had the time to work with Pottery Mound ceramics. Dave Phillips suggested that we work with Cordell's 1979 field school collections, as they were well-provenienced and are the only known surviving stratigraphic sample from the site. Phillips's background research and documentation have proved very useful. Indeed, his continued support and assistance is greatly appreciated.

The results of the study are intended to be both descriptive and interpretative. I feel strongly that the sweeping conclusions that archaeologists love to pronounce must be based securely in "lower level" findings, which in turn are grounded on extensive and detailed analysis. Conclusions based on speculation or inadequate analysis are meaningless. As such, the approach taken was largely inductive. Although I had no specific hypotheses to test initially, the analytical framework was designed to capture data relevant to typology, classification, chronology, vessel function, production methods and locations, and regional trade. Needless to say, many conjectures and leads opened up during the course of the analysis. Later, these ideas were examined further for their potential to reveal trends in the data.

To capture the relevant data, the specific steps included:

1. Describe types and sub-types (varieties) completely, augmenting previous work at the site. The type-variety system long used in the Southwest carries much spatial-temporal-cultural meaning, if used correctly (Colton 1953). Due to the identification of similar types over a wide area by various investigators, cross-site correlation of types and the cross-dating of those types makes pottery types especially useful in the Southwest. The sub-type or variety level of classification may further delineate minor subdivisions of the major types, indicative of local variation or minor temporal variation on a theme.

2. Seriate the types and varieties based on physical attributes, to form an evolutionary sequence through time. That is, formulate a hypothetical time series that relates to the type and varieties in previously defined series.

3. Evaluate changes in types, varieties, materials, and rim forms through time, based on stratigraphic relationships. Plot the type frequencies by level to verify the tentative seriation as well as to check the traditional chronology. Assess temporal change both qualitatively and quantitatively. Re-evaluate the site's chronology in light of the few tree-ring dates and the sequence documented by Cordell's 1979 stratigraphic test.

4. Gain information on vessel function and usage. Examine quantities of sherds by descriptive categories (e.g., bowls vs. jars and painted vs. utility) to determine the relative emphasis on major morphological and functional categories.

5. Estimate numbers of whole vessels present, using rim diameter totals and by sherd size estimates.

6. Determine what materials were utilized in the production of pottery at or near the site. Compare paste and slip clays from the local environment to fired ceramics in order to show which potters' materials were available, and which were actually used in the production of the massive quantities of pottery at the site. Conduct refiring (oxidation) and petrographic thin section analysis to match clays and tempers to available resources. From that, evaluate resource utilization and ceramic production by local potters.

7. Address trade and exchange. Identify pottery traded in, based on the recognition of well-known types made in other Pueblo IV period villages (e.g., Acoma and Hopi), and examine pastes and tempers for constituent ingredients that do not match known local resources. Examine all non-local pottery for paste and temper data using a binocular microscope, to confirm not only the non-local origin pottery but, where possible, its place of origin.

The Sample

The ceramic sample for this project was the entire ceramic collection of the 1979 UNM field school excavation, directed by Linda Cordell (Cordell 1979, 1980b)—some 38,000 sherds. One small whole vessel and several large vessel fragments were unearthed, but except for this the ceramic refuse consisted of sherds. (The Maxwell Museum does have a set of whole or restored vessels from earlier excavations that was useful for comparative purposes.) Analysis proceeded one bag at a time, preserving all the provenience information recorded in the field (grid, quad, level). Most material was re-bagged in plastic and assigned catalogue numbers as part of my work.

For present purposes, the most important provenience information is the level number, which started with 0 (surface) and continued through Level 17. Levels were 20 cm thick, so total depth of the trench was some 3.4 m (Cordell 1980b). Excavation stopped when sterile (or nearly sterile) soil was reached. Level 17 was excavated in only one of the quadrants of the trench, resulting in a small sample size.

As was pointed out, Cordell's 1979 work is the only stratigraphic sample from the site known to have survived. There are several potential problems with the sample, however. As is often the case with initial stratigraphic tests, the unit was not excavated according to natural stratigraphy but in terms of arbitrary 20 cm levels. Thus, while any changes in site assemblages should be apparent over the several meters of deposits, each level sample may blur changes from one stratum to the next. Fortunately, as the profile drawings of the completed unit indicate, the excavated strata were horizontal or almost horizontal, so the mixing of deposits of different ages in levels was presumably minimal.

Also, even though it is often assumed that thick trash deposits are the result of continuous deposition, there is no guarantee that this is so. Periods when trash was not deposited (due to short-term abandonment), or deposited in another midden, are also a possibility, as is trash being already mixed by the time it became part of the deposits being studied.

Despite these possible drawbacks, the 1979 collections remain the best sample available from the site. According to Linda Cordell, the strata were fairly horizontal, and testing covered the full depth of deposits. Her feeling is that the collection is a suitable one for the types of study undertaken here.

Recording and Analysis

A paper form was used to record data for later computer entry and analysis. The form is shown in Appendix A, and the analysis codes are provided in Appendix B.

The sample consisted of all sherds from the 1979 collection that could be located—a total of 38,429 potsherds. Every sherd larger than 1 cm across was examined and recorded on the paper form. Data categories included pottery type and variety, vessel form, predominant and secondary temper type, vessel shape, portion of the vessel, and (for rims) rim diameter and degree of arc.

Pottery type was based on standard Southwestern types and varieties. At Pottery Mound, several sub-types or varieties were recognized within the named types (Table 3), and were recorded on the analysis sheet. Type codes were modified from a list used previously at Valencia Pueblo, a Pueblo IV site (Franklin 1997), as many of the types were the same. Some types used at Valencia Pueblo were eliminated, as they did not appear in the 1979 Pottery Mound sample. In addition, new codes were invented for sub-types or varieties as those were recognized. Subdivisions of San Clemente Glaze Polychrome and Agua Fria Glaze-on-red were discerned, for example, and were therefore codified. Thus, the type codes include all major pottery types known from the literature, along with subdivisions at the variety level where possible.

Vessel form encoded general shape (bowl, jar, ladle, etc.) Vessel part referred to the portion of the vessel (rim, body, handle, etc).

Table 3. Classification of Local Glazeware Types at Pottery Mound.

Agua Fria Glaze-on-red (2 varieties)
- Red slipped variety
- Orange slipped interior variety

Cieneguilla Glaze-on-yellow
- Cieneguilla Glaze-polychrome
- (overlaps with Pottery Mound Polychrome?)

San Clemente Glaze-Polychrome (4 varieties)
- White interior, red exterior
  - Chalky white slip
  - Creamy white slip
- Red interior, white exterior
  - Chalky white slip
  - Creamy white slip

Kuaua Glaze-Polychrome (closely related to San Clemente)
- (slanted, beveled rim with exterior decoration only)
- (may cross-cut other types?)

Pottery Mound Glaze-Polychrome (2 varieties)
- White slip
- Orange to buff to olive slip

Temper was recorded by clipping the sherd edge and examining the paste and tempering materials through a binocular microscope. Identification was made to one of several gross categories, including potsherd temper as well as several varieties of igneous rock, particularly basalt. Only major rock groups can be identified with the binocular scope, while detailed identification must await petrographic thin section examination, and will be reported later. A major and minor temper could be encoded, but almost always there was only one tempering ingredient.

Temper was identified with a microscope for all sherds except plainware and Agua Fria (red and orange slip) body sherds; for these plentiful types, an adequate temper sample was obtained from the rim sherds. All rim sherds of all types in the collection, as well as all body sherds of types other than plain utility and Agua Fria, were clipped and viewed under the microscope.

For rim sherds, diameter and degree of arc were measured using a board on which concentric semicircles (at 2 cm diameter intervals) and 10 degree radial lines (defining pie shapes) were drawn. Assuming that the rim was long enough to be correctly recorded, the rim curvature was matched to a drawn semicircle, yielding a rim diameter and the degrees of arc for the sherd. For rim sherds with less than 20 degrees of arc, no rim diameter was recorded.

The count category recorded the frequency of each particular combination of type and attributes.

Analysis proceeded one bag at a time. As the recording proceeded, bags were assigned Maxwell Museum catalogue numbers. Bag numbers were assigned consecutively as analysis proceeded, and are unrelated to particular levels in the site.

As bags of sherds were examined, some sherds were pulled and bagged for a special collection. Pulled sherds included all Pottery Mound Polychrome, all intrusive (non-local) sherds (based on typology or paste and temper), any sherds unusual in some respect, and all fragments of small "test pots."

Data were entered from the sheets into an Microsoft Access database, with the assistance of Holly Franklin. Entered data were checked against the original forms to ensure accuracy. Data extraction and manipulation was done by means of queries in Access, and by importing much of the data into Microsoft Excel spreadsheets for further treatment.

Chapter 3

RIO GRANDE GLAZE WARE

The following description of Rio Grande Glaze Ware, as found at Pottery Mound, provides a foundation for the discussions to follow. In general, the glazeware types fit fairly well into published descriptions. It is important, however, to make explicit the typology used during this project, as well as to describe ways in which the Pottery Mound types differ from the "norm." In addition, digital photography allows us to illustrate examples in color and in abundance, marking an advance from the text-based descriptions relied on in past literature.

Classificatory Framework

The locally produced painted pottery of Pottery Mound falls geographically into the Middle Rio Grande region and into the Pueblo IV period. In Chapter 1, Table 1 provides names and customary dates for all types identified in the assemblage. In the same chapter, Table 2 focuses on the Rio Grande glazeware sequence, with types assigned to Mera's (1933) Glaze A through F sequence. The Eighth Southwestern Ceramic Seminar (1966) described the regional glaze wares and a recent Museum of New Mexico guide (Wilson 2005) illustrates these types in color. Table 4 provides a typological summary of the 1979 test pit assemblage.

The common locally produced glaze ware types at Pottery Mound include Agua Fria Glaze-on-red (G/r), San Clemente Glaze Polychrome (G/p), Kuaua Glaze Polychrome (G/p), and Pottery Mound Glaze Polychrome (G/p) (see also Table 3 in Chapter 2). Traditional pottery definitions by Mera (1933, 1935, 1940) and others, employed by earlier investigators of Pottery Mound pottery, were the basis for the current classification.

Where these "standard" types could be subdivided into subtypes (varieties), based on empirical observation, sherds were also assigned to subtypes. In other words, the existing typology was refined based on patterning within the Pottery Mound assemblage.

Common Attributes

Collectively, the glaze painted ceramics at Pottery Mound share many attributes, which therefore can be described only once. This is not surprising, as they belong to the same ware and are sequential types within the same production environment. In particular, the local materials used in paste and temper remained quite constant. So did basic vessel forms and sizes. Even basic design motifs carried across all the glazeware types with surprising regularity. Specific types differ in only a few respects, primarily the placement of slips and vessel rim forms (profiles). Thus, the common attributes of all the glazeware types are described first; afterwards, the distinct features of each type and variety will be delineated.

Table 4. Pottery Counts.

Types (Codes)	Number	Percent of Group	Percent of Total
Group 1: Rio Grande Glaze Ware			
Early Glazewares			
Los Padillas Glaze Polychrome (101)	2		
Arenal Glaze Polychrome (105, 106)	16		
Subtotal	18	0.09	0.05
Agua Fria design scheme			
Red slip, painted (110)	4,575		
Red slip body sherd, unpainted (91, 96)	6,774		
Orange slip (111)	3,075		
Orange slip body sherd, unpainted (97)	1,002		
Agua Fria Glaze Polychrome (112)	3		
Subtotal	15,429	77.80	40.15
Cieneguilla design scheme			
Cieneguilla Glaze-on-yellow (120)	777		
Cieneguilla Glaze Polychrome (121)	16		
Subtotal	793	4.00	2.06
San Clemente design scheme			
San Clemente Glaze Polychrome			
Red exterior, chalky white interior (115)	434		
Red exterior, creamy white interior (116)	1,077		
Chalky white exterior, red interior (117)	772		
Creamy white exterior, red interior (118)	118		
White or creamy slip on both sides (119)	69		
Unpainted body sherd, red and white slips (92)	165		
Unpainted body sherd, white slip on both sides; either San Clemente or Cieneguilla (93)	220		
Kuaua Polychrome, as a San Clemente variant			
Kuaua Glaze Polychrome, bowls (302) (Note a)	16		
Subtotal	2,871	14.48	7.47
Pottery Mound Polychrome			
Not further specified (125)	12		
Tan-cream slip (126)	509		
Chalky white slip (127)	175		
Red-on-white sherd (130)	1		
Subtotal	697	3.51	1.81

Table 4. Pottery Counts.

Types (Codes)	Number	Percent of Group	Percent of Total
Glaze A, not further specified (100)	9	0.05	0.02
Glaze B, Largo Glaze-on-yellow (201)	8	0.04	0.02
Glaze C, Espinoso Glaze Polychrome (301)	1	0.01	0.00
Glaze D			
Based on rim form (400)	2		
San Lazaro Glaze Polychrome (401)	4		
Subtotal	6	0.03	0.02
Total, Group 1	19,832	100.00	51.61
Group 2: Western Pueblo Wares			
Acoma-Zuni Glazewares and Utility Wares			
Kwakina Glaze Polychrome (Zuni) 810	2	0.31	0.01
Acoma-Zuni glazewares, not further specified (830)	351	54.84	0.91
Cibola-Acoma plain utility wares (740)	47	7.34	0.12
Cibola-Acoma corrugated (750)	1	0.16	0.00
Hopi Wares			
Jeddito Black-on-yellow (850)	94	14.69	0.24
Sikyatki Polychrome (860)	17	2.66	0.04
Hopi yellow ware, not further specified (870)	111	17.34	0.29
Hopi plain utility ware (880)	9	1.41	0.02
Hopi corrugated ware (881)	8	1.25	0.02
Total, Group 2	640	100.0	1.67
Group 3: Matte Paint and Utility Wares			
Gallup Black-on-white (805)	1	0.60	0.00
Red Mesa Black-on-white (10)	5	3.01	0.01
Puerco-Escavada Black-on-white (11)	2	1.20	0.01
Socorro Black-on-white (12)	76	45.78	0.20
Chupadero Black-on-white (13)	3	1.81	0.01
Santa Fe Black-on-white	3	1.81	0.01
Biscuit A (Abiquiu Black-on-gray) (25)	22	13.25	0.06
Biscuit B (Bandelier Black-on-gray) (30)	20	12.05	0.05
Sankawi Black-on-cream (71)	2	1.20	0.01

Table 4. Pottery Counts.

Types (Codes)	Number	Percent of Group	Percent of Total
Group 3: Matte Paint and Utility Wares, Continued.			
Red-on-tan (83)	4	2.41	0.01
Los Lunas Smudged, Pilares Banded (725)	27	16.27	0.07
Sapawe Micaceous Washboard (730)	1	0.60	0.00
Total, Group 3	166	100.00	0.43
Group 4: Local Plain and Textured Utility Wares			
Clapboard corrugated (701)	51	0.29	0.13
Indented corrugated (705)	122	0.69	0.32
Obliterated (smeared) corrugated (706)	152	0.85	0.40
Plain gray (710)	17,426	98.00	43.35
Plain gray, micaceous paste (715)	10	0.06	0.03
Plain utility, not further specified (799)	20	0.11	0.05
Total, Group 4	17,781	100.00	46.27
Unknown (0, 999)	10		0.03
Grand Total	38,429		100.00

Note: 90 sherds of Kuaua Glaze Polychrome, bowls, are included in the San Clemente Glaze Polychrome count.

Paste

When fired, local paste clay is red, roughly "brick" red—by Munsell Color Chart values, the fired clay is 2.5YR 5/6 or 5/8. This color is very consistent in all the glazeware types produced at the site, and is result of collecting the abundant red clay found along the local section of the Rio Puerco. In most sherds, a carbonaceous or less oxidized core is seen in cross-section, indicating that the oxidizing atmosphere used in firing was not hot or prolonged enough to color the whole clay body to a uniform brick red (Shepard 1963). Still, the clear and bright colors of the surfaces indicate a consistent control over firing temperature and atmosphere. Uniform and unclouded surfaces on most pots show that potters effectively managed the firing process. This is difficult to achieve with regularity, given the prehistoric practice of firing pots in open, above-ground fires fueled with wood.

Temper

Tempering materials are added by Pueblo potters to bind the clay body more securely and thus increase resistance to breakage. Non-plastic materials also reduce drying shrinkage, which helps prevent cracking during air-drying and subsequent firing. Many materials may be utilized for this purpose. Ideally the material would have no expansion properties that might lead to spalling, and would have jagged edges which easily bind to clay particles and strengthen the vessel walls (Shepard 1963). Ground potsherd tempers are ideal and were used extensively in the Southwest, particularly by potters in the Cibola-Chaco ceramic tradition.

Preferred rock tempers include igneous materials, which are already highly "fired" by nature and will not change during pottery firing. They also have coarse edges and can be ground down to any desired size. Pumice and Tuff were used (and are still used) by potters in the Bandelier-Cochiti area, and basalts were used in the Middle Rio Grande area (including the Albuquerque area) (Shepard 1942).

At Pottery Mound, basalts from nearby volcanic peaks and flows were abundant and extensively used (Warren 1982; Eckert 2003). The local vesicular basalt makes an ideal tempering material and was available at no great distance from the village. Black, red, and gray vesicular basalts were all used extensively, in most of the glazeware and in almost all of the indigenous plain utility ware. Small chunks of these basalts litter the site surface. Manos and metates were frequently made of the same materials, so it is possible that pottery temper was prepared from exhausted grinding implements. Related volcanic rocks used in minor quantities include augite-hornblende diorite , olivine basalt, fine grained aphanitic basalt, gabbro and breccia. All of these rocks are available either in the Hidden Mountain volcanic cones about 8 km (5 miles) to the north or in the low hills 5 km (3 miles) to the east, the latter formed by flows from vents in the area. Thus, although basalt outcrops do not occur at Pottery Mound, tempering materials were obtainable within a reasonable distance of potters' residences.

The black, red, and gray vesicular basalts are quite readily identified in cross-section under a binocular or petrographic microscope. Second in use frequency is another dark igneous rock. Identified at first as "intermediate igneous rock" (Warren 1982), it is now thought to be a

porphyritic basalt with abundant augite. This rock may also be classified as gabbro or diabase. Like the vesicular basalt, the porphyritic basalt is available at Hidden Mountain. Taken together, the two types of basalt account for more than 90 percent of the temper observed in the locally made glazeware.

Sandstone is present on the surface of the site, usually as small red slabs which may have been used as grinding surfaces. It was available as close as Hidden Mountain. Sandstone temper is a rarity in the glazeware, however.

A specific volcanic rock, probably a hornblende latite, occurs in a few glazeware sherds. It often occurs with a yellow paste clay. This combination of clay and temper may signify a non-local origin. Such sherds occur infrequently in the collection and most likely represent imports (especially in the case of Espinoso Glaze Polychrome) from contemporary glazeware-producing villages in the Galisteo Basin. Additional data on tempers will be presented in Part 2 of this report.

Vessel Walls

Vessel walls tend to be thin and durable. Wall thickness is between 4 and 6 mm. Walls are parallel-sided and even.

Surface Treatment

Even and regular surfaces are the rule; almost no bumps or irregularities are seen or felt. This uniform result is the result of careful scraping and smoothing.

Slip

Slips of medium red, orange red, tan/fawn/olive, creamy white, and chalky white were attained by the prehistoric potters. The choice of slip and its area of application are key attributes for separating pottery types (see below). Various local and (probably) imported slip clays were utilized to produce a variety of visual effects on the finished vessels. Contrasting slips on opposite sides of bowls are very common, and are a defining characteristic of San Clemente Glaze Polychrome in particular.

In general, slips were applied evenly and completely over the desired surface (interior or exterior). Streakiness and missed spots are rare. One exception is the chalky white slip, which is always thin, and at times shows streaks where coverage was uneven. As this slip may have been imported, the material may have been “valuable” and used in sparing amounts, leading to a thin, streaky appearance.

Paint

The paint that is the hallmark of Pueblo IV Rio Grande Glaze Wares contains sufficient lead and other mineral compounds to flux and turn glassy within the normal temperature range of prehistoric firings. During Glaze A through C, local paint was fairly well controlled by the potters, as was true throughout the range of glazeware production. Throughout the local production sequence, the paint was carefully applied. The paint vitrified and turned black (or sometimes dark brown) during firing; bubbles and runs are occasionally seen but show no particular association with pottery type, nor are they more common late in the sequence. Examples of green or light brown fired paint occur but are quite rare.

Decoration

Although patterns of decoration differ from type to type within the Pottery Mound glazeware sequence, many of the major elements, motifs, and layouts remain constant (see Brody [1964] and Eckert [2003] for more complete discussions of the decorative and stylistic aspects of the local pottery). Although the current study was done on potsherds and was not dedicated to design analysis, a few comments may be made.

Layouts are predominantly banded—that is, a "ring" of painted decoration was created, and set off from the rest of the vessel by framing lines at the top and bottom of the painted designs. Most bowl interiors were laid out in this way, usually with the bottom of the bowl left unpainted or with an isolated cross or small motif in the bottom center. Within the band, vertical lines were commonly used to divide the design area into multiple panels. Lines are medium width; fine-lined decoration would have been difficult to achieve with glazed paint in any case.

Design elements and motifs within the bands and panels consist of bold geometrics such as rectangles, triangles, stepped triangles, stepped lines, circles, and dots. The elements have clear antecedents in the Southwest; the White Mountain Red Ware tradition (from which Rio Grande Glaze Ware probably evolved), Mesa Verde Black-on-white, and Gila Polychrome have similar elements and motifs. In other words, elements and motifs often used at Pottery Mound were part of a "generic" repertoire for the Puebloan Southwest.

Other design elements, more restricted to the glazeware tradition, also appear. The use of a circle and dot "eye" element, usually within a solid triangle or rectangle, is quite common. Hooked or curved appendages pendant to triangles or rectangles may signify a bird's beak. The use of isolated (non-banded) elements on bowl exteriors is quite reminiscent of late Mesa Verde Black-on-white of the Four Corners area. At Pottery Mound, the isolated elements are most commonly simple crosses (St. Andrew's cross) or crosses with a double cross-bar line (cross of Lorraine).

More rarely, sherds have "shield" motifs, diamond-shaped or square, with internal elements. These also bear a resemblance to the isolated "shields" or emblems on Mesa Verde Black-on-white. The possible meaning of such isolated motifs is unknown, though interpretation as clan or other symbols of social affiliation is tempting.

Zoomorphic and anthropomorphic designs are rare. Birds are the most common, but are typically rudimentary and stylized. Beaks, feet, birds in profile, etc. occur in all of the glazeware types. Some may represent parrots or macaws, but most are too generalized to allow specific identifications. Insects are represented by small black figures, again very general. The most common insect motif seems to be the dragonfly, with a stick-like body and perpendicular wings (the cross of Lorraine form just described). Some of the zoomorphic elements also occur in Hopi designs (Fewkes 1973).

Temporal trends in designs are difficult to study from sherds. Basically, however, the layout and use of geometric figures persists through time, occurring in all major glazeware types. Stylized life forms, such as bird and insect motifs, appears to become more through time, culminating in Pottery Mound Glaze Polychrome.

Vessel Forms

Glazeware types at Pottery Mound share the same basic vessel forms, differing only in rim treatment (a chronological trait). Open-mouthed bowls predominate. Slightly less than hemispherical, the bowls have rounded bases and sides that are close to vertical. A slight inward curvature is often seen, especially in Glaze A vessels. Wall thickness is uniform, changing only near the lip, where special rim treatments sometimes thickened the vessel wall. Bowls vary in size from about 20 to 40 cm. in diameter

During the glazeware period, bowl rim shapes underwent rapid changes through time. Experimentation with rim treatment characterizes the period, extending to Biscuit types and even plain utility ware. This tendency was noted at Pecos Pueblo (Kidder and Shepard 1936), then across the glazeware production area by Mera (1933, 1935, 1940). As a result, rim shape has become the key criterion for identifying temporal change in Pueblo IV pottery. Now, however, it is becoming apparent that glazeware rims also varied over space. Glaze B rims, for example, are characteristic of the Galisteo Basin but rare in southern glazeware sites.

The bodies of jars were more or less spherical. Necks were about 3 cm. high, with the profile being straight to slightly outcurving, the latter especially near the rim. Rim treatment does not vary as much as with bowls, and has not been shown to be temporally-sensitive.

Other forms include ladles, canteens, and miniature vessels. Many small test (pinch) pots occur, probably representing learning by youngsters or experimental tests by experienced potters.

Types

The local glazeware types differ from each other in three major respects: slip color, paint placement, and rim form. Each type will now be described. Figures 5 and 6 show the general progression of rim profiles in the region. Figures 7 through 14 illustrate rim forms for types as found at Pottery Mound.

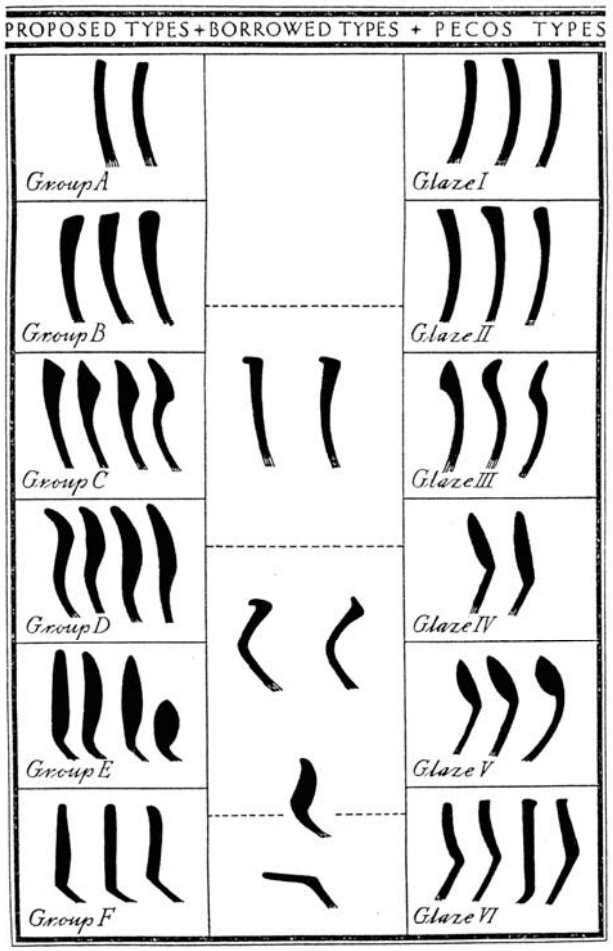

Figure 5. Mera's (1933) proposed glazeware rim sequence.

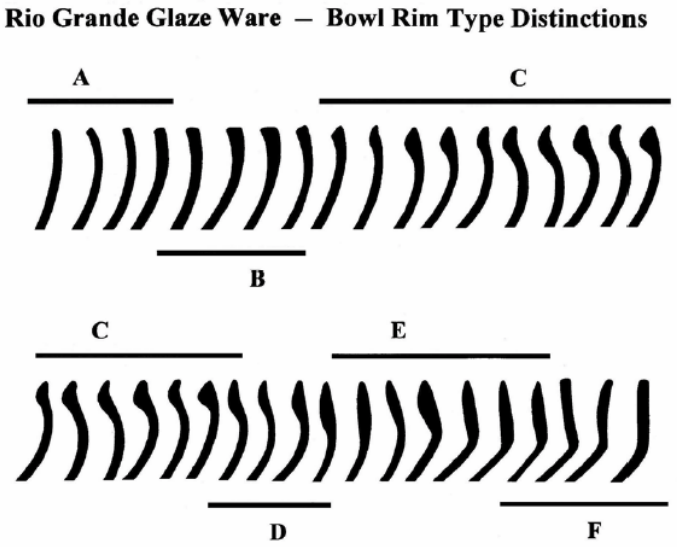

Figure 6. Glazeware bowl rim forms: a more recent series. From Wilson (2005).

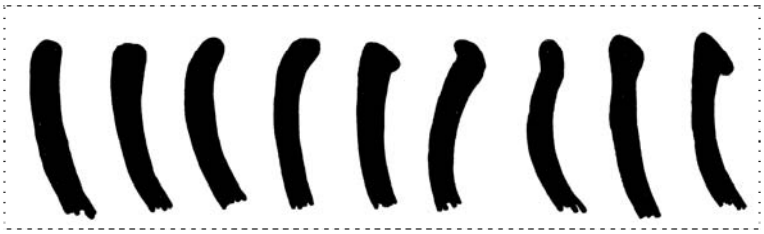

Figure 7. Agua Fria Glaze-on-red bowl rim profiles. Bowl interior to right; more common forms to left, rarer forms to right.

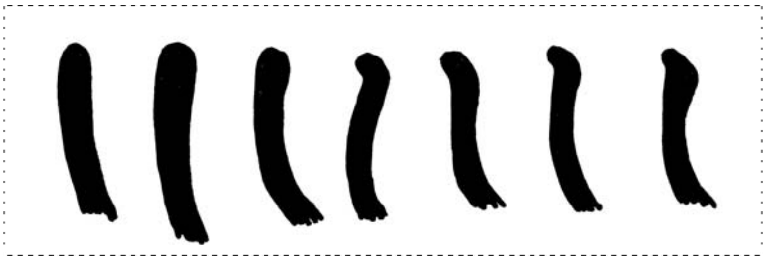

Figure 8. Cieneguilla Glaze-on-yellow bowl rim profiles.

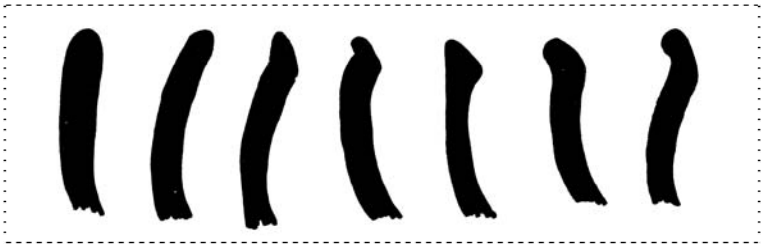

Figure 9. San Clemente Glaze Polychrome bowl rim profiles.

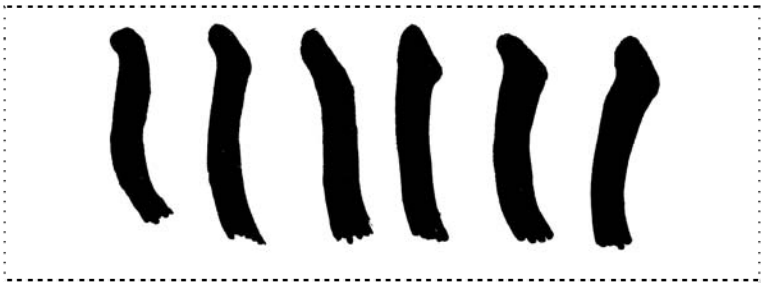

Figure 10. Kuaua Glaze Polychrome bowl rim profiles.

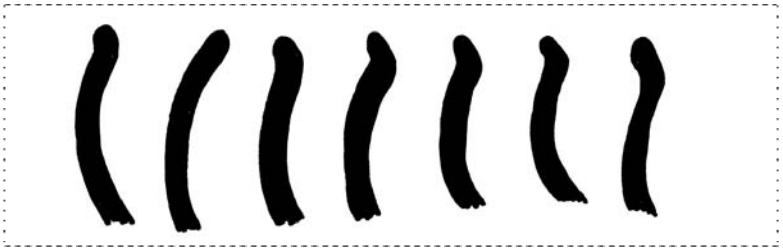

Figure 11. Pottery Mound Glaze Polychrome bowl rim profiles (early).

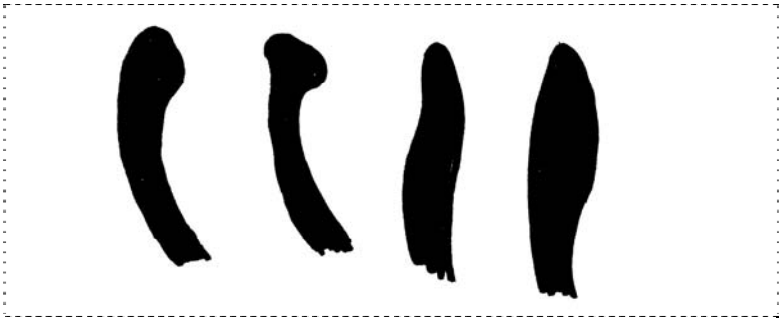

Figure 12. Pottery Mound Glaze Polychrome bowl rim profiles (late).

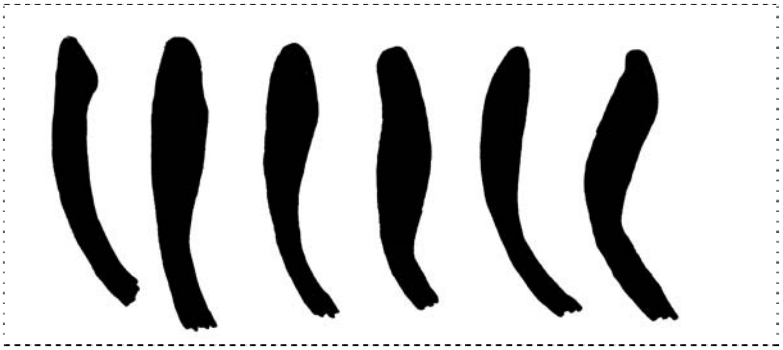

Figure 13. Late Glaze C and Glaze D bowl rim profiles.
On Pottery Mound and San Lazaro Glaze Polychrome vessels.

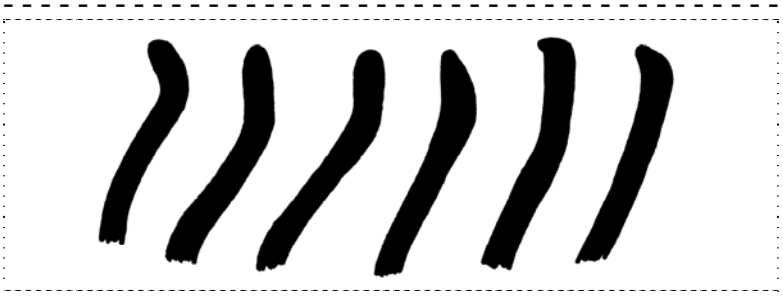

Figure 14. Glazeware jar rim forms.

Early Glaze Types

Los Padillas and Arenal Glaze Polychrome are the earliest glazeware types in the Rio Grande region. They were derived from prototypes such as St. Johns and Heshtauthola Polychrome, part of the White Mountain Red Ware series of eastern Arizona (Carlson 1970; Mera 1933, 1940). St. Johns Polychrome occasionally shows incipient glazing of the black paint. In Heshotauthla Polychrome, the black paint is consistently glazed for the first time. Both of these late 1200s polychromes were widely traded. Due to the resulting stylistic influence, and possibly also due to immigration, variants of White Mountain Red Ware were made along the middle Rio Grande in the very late 1200s. Like the originals, the local copies had red interior and exterior slips, black interior glaze paint, and white exterior paint. The local imitations are neither plentiful nor well defined, however. At a 1966 ceramic seminar, the consensus was that Los Padillas was so close to Heshotauthla as to be considered a local variant of that type (Eighth Southwestern Ceramic Seminar, 1966). The key difference between Los Padillas and Arenal seems to be the use of sherd versus rock temper—a difference so minor that only variety status is warranted. Very few sherds of these two early types appear at Pottery Mound, indicating that the types predate the major occupation.

Agua Fria Glaze-on-red

This is the classic Rio Grande glazeware type (Figures 15 and 16). It typifies the series, and was plentiful in almost all glazeware-consuming villages during the early part of the glazeware period. Produced in massive quantities, Agua Fria remained the most popular type at Pottery Mound during its entire occupation. Conforming to the generalized description provided above, glaze paint for Agua Fria is well-controlled and black. A glaze sheen is always apparent, but the glaze was not runny and held the line edge well. Brown or green glaze paints are also seen, but only rarely. The slip covers both interior and exterior surfaces evenly and is stone-polished, but not to the point of losing its matte finish.

The red slip is medium to dark red in most examples, but becomes increasingly orange-red with time. Indeed, some pieces are very light orange, and grade into Cieneguilla Glaze-on-yellow. In the analysis, the orange-slipped variety of Agua Fria Glaze-on-red was coded separately from the dark red, but no other attributes seem to correlate with the red-to-orange color change. The orange-slipped pieces may have been called San Clemente or Cieneguilla by other workers who did not recognize an orange variant of Agua Fria. In this analysis, San Clemente must have a white or cream slip, not orange.

As was described earlier, painted decorations typically consist of geometric elements in a banded layout.

Rims are almost always straight in profile, with rounded lips. This is the typical Glaze A form. Flattened lips (as in Glaze B) and thickened-beveled lips (as in Glaze C) also occur in the type, however (Figure 7). This suggests a great variety of treatment of rims within the type, between potters, and perhaps with time.

Figure 15. Agua Fria Glaze-on-red, red slip variety.

Figure 16. Agua Fria Glaze-on-red, orange slip variety.

The everted-rim variant of Agua Fria was given separate status as Sanchez Glaze-on-red by the Eighth Ceramic Seminar (1966:4). This type was not coded as such on this project, being only one of several rim variants within Agua Fria. The small quantities of B rims and slightly larger numbers of C rims also imply a long lifespan for the type.

At Pottery Mound, Agua Fria rims are sometimes ticked in the manner of Mesa Verde black-on-white pottery. This may reflect the persistence of a common Pueblo III trait. Rim ticking is straight or diagonal, and is applied in black glazed paint.

Bowls are hemispherical, ranging widely in size (from 20 to 40 cm in diameter). Jars are globular, with straight or slightly everted rims.

Cieneguilla Glaze-on-yellow

The use of a yellow slip instead of a red one began early in the Rio Grande glazeware trajectory. As a variant on the glazeware theme, yellow-slipped Cieneguilla is essentially the same as Agua Fria in all other respects. At Pottery Mound, Cieneguilla is the only type completely yellow-slipped on both surfaces (Figure 17). No white-slipped or orange-slipped pieces were included. Admittedly, the continuum in slip colors can lead to a sorting bias, which in this case possibly diminished the "yellow ware" count as compared to tallies by other investigators.

Figure 17. Cieneguilla Glaze-on-yellow.

The paint characteristics are the same as for Agua Fria Glaze-on-red, albeit with a tendency to slightly bolder designs. Choice of painted areas and design elements are also similar. Here again, rims are mostly A in style, but a slight increase in B rims and C rims is noted compared to Agua Fria (Figure 8). This pattern might indicate a slightly later inception for Cieneguilla than for Agua Fria, agreeing with typically assigned dates for Glaze A yellow ware and redware (Table 2). Cieneguilla is common at Pottery Mound, although never near as popular as Agua Fria. It is also more frequent in earlier strata than later ones, but never went out of production.

A version of this type with small red-filled areas outlined by black paint was recognized as Cienegulla Glaze Polychrome by the Eighth Ceramic Conference (1966:10). That variant is almost absent at Pottery Mound. Instead, the "polychrome niche" was filled by San Clemente Polychrome and then Pottery Mound Polychrome. Cieneguilla Glaze Polychrome is similar to Pottery Mound Glaze Polychrome in having three colors on a single surface but differs in slip color. The polychrome version of Cieneguilla has a creamy yellow slip on both surfaces, not the chalky white, olive, or tan seen on Pottery Mound Glaze Polychrome. Nor does it include some of the more intricate slip-paint combinations or fine painted motifs of Pottery Mound Glaze Polychrome. The possibility of typological overlap is present, however.

San Clemente Glaze Polychrome

San Clemente Glaze Polychrome is the first major polychrome type in the series. San Clemente was very popular at Pottery Mound, and included substantial variation in the use of slips (Figures 18–20).

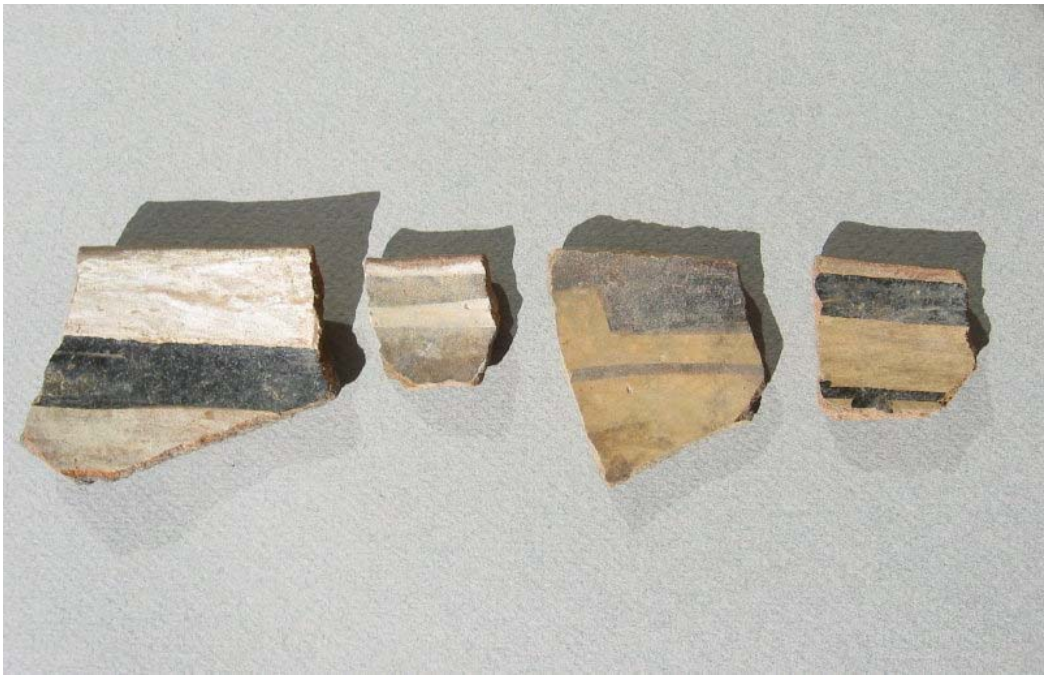

Figure 18. San Clemente Glaze Polychrome. Left, chalky slip; right, creamy slip.

Figure 19. A San Clemente Glaze Polychrome sherd. Left, white-slipped exterior; right, red-slipped interior.

Figure 20. Six San Clemente Glaze Polychrome sherds. Left, interiors; right, exteriors.

The standard defining characteristic of San Clemente Glaze Polychrome is the use of different slips inside and outside the bowl. In contrast, Pottery Mound Glaze Polychrome and Glaze C and D types such as Espinoso and San Lazaro Glaze Polychrome involve at least two paint colors against the slip color on a single side of the bowl. According to the Eighth Ceramic Seminar (1966:6), San Clemente Glaze Polychrome is distinguished by a white slip on one surface and red on the opposite surface. Most commonly the interior is white and the exterior is red, though the slip colors are sometimes reversed. Another variant was also identified, involving a white slip on both surfaces. Except for the slip color, the variant resembles Cieneguilla Glaze-on-yellow.

All in all, the current analysis recorded five variations, based on locations of slips and chalky versus creamy white slip. These variants were encoded as follows.

- Chalky white slip interior, red slip exterior
- Creamy white slip interior, red slip exterior
- Chalky white slip exterior, red slip interior
- Creamy white slip exterior, red slip interior
- White slip on both surfaces, no red used

The contrast between the creamy and chalky white slip is quite noticeable in both San Clemente and Pottery Mound Glaze Polychrome, and marks a difference in slip materials (Brody 1964; Voll 1961). First noticed by Voll (1961), the various arrangements of white and red slips are noteworthy. While the temporal or social implications are not apparent at this time, the considerable amount of variation should be monitored in future studies.

Sherds with a white interior and red exterior are most common. Creamy white slips are more common than chalky white slips.

Closer inspection reveals a pattern of chalky slips used on exterior surfaces rather than interior surfaces. Conceivably, this pattern is related to the common use of exterior chalky white slips on Acoma and Zuni bowls of the period, some of which were imported to Pottery Mound. Furthermore, the raw material for the chalky white slip may have been brought from Acoma or its environs, as that material does not occur at or near Pottery Mound. The chalky white slip may then have been used on San Clemente to mimic Acoma or Zuni usage—whether consciously or unconsciously is unknown.

In painted design and vessel form, San Clemente is similar to the glaze-on-red examples from Pottery Mound. The San Clemente rim forms again span Glaze A through C (Figure 9). An greater emphasis on Glaze C rim forms, relative to Agua Fria, indicates a later time placement, at least for some San Clemente. Rim ticking is common, especially on rims that are thickened and flared so that extra rim area is exposed.

Kuaua Glaze Polychrome

Kuaua Glaze Polychrome consists of bowls with an incurving rim or even a marked “shoulder” (Figures 21 and 22)—that is, the rim diameter is smaller than the maximum vessel diameter. As a result, painted decoration is usually confined to the vessel exterior. The incurving rim ends with a sharply slanted or beveled lip. The combination of incurving rim, beveled lip, and paint on the exterior only is what distinguishes this little-known type, named for a ruin at Coronado State Monument.

Figure 21. Kuaua Glaze Polychrome bowl exteriors.

Figure 22. Kuaua Glaze Polychrome. Left, interiors; Right, exteriors.

First defined by Mera (1933:6), Kuaua Glaze Polychrome was subsumed into Espinoso Glaze Polychrome by the Eighth Ceramic Seminar (1966:18), on the grounds that Kuaua was a variety of Espinoso. For both Mera and the Seminar, Kuaua dated to the Glaze C period. Rims are thickened and sharply beveled, so are always Glaze C in shape (Figure 10). Eckert (2003:205) subsumed the type within her "Hidden Mountain Polychrome."

At Pottery Mound, Kuaua is an outgrowth of San Clemente, and presumably was made late in the site's history. Like San Clemente, Kuaua usually does not display three colors on a single side of the vessel. Very often it is red on the interior and white-slipped on the exterior, in the general San Clemente pattern. Bowls with three colors on the exterior surface would be classed as Pottery Mound Glaze Polychrome. At Pottery Mound there are rare Kuaua vessels with interior as well as exterior painted designs. Thus, the primary attributes of vessel shape, incurving rim, and beveled lip, usually (but not always) occur with (1) white-slipped exteriors with painted designs and (2) red-slipped interiors with or without painted designs.

Pottery Mound Glaze Polychrome

At Pottery Mound, the culmination of the potters' art was Pottery Mound Glaze Polychrome (Figures 23–26). It was probably the latest to develop and often has the most elaborate decorations of any of the types.

Pottery Mound Glaze Polychrome was placed in the Glaze A period by the Eighth Ceramic Seminar (1966), but the participants did not define the type in any detail. It is an outgrowth of San Clemente Glaze Polychrome, but in Pottery Mound three colors (white, red, and black) are all used on the same surface. Indeed polychromy was carried to an extreme, with four colors of slips and paints sometimes being used on a given surface (Figure 23). On one sherd examined during this study, there are four colors on the interior surface and three on the exterior! The variability in slip color and combinations of colors is remarkable, even extravagant.

The current analysis identified two major variants. One has a thin washy white chalky slip, the other has a slip that varies from tan to buff to fawn to olive green. Most sherds can be separated into one variety or the other, but there are many variations in the arrangement of slips and paint colors. The contrast between slips mirrors the situation for San Clemente. In the case of Pottery Mound as well, the chalky white slip variety is always in the minority. Paste and temper are the same as for the other local glazewares at the site, so there is no doubt of the type's local origin.

Bowls and large jars are common. Glaze A rims predominate, but a significant number of rims are beveled, or else incurved and everted/beveled (Figures 11 and 12). Some 40 percent of the sherds have rims that could be classed as Glaze C, based on thickening, eversion, beveling, or incurving of the rim (Figure 12). (Bowls with the distinctive incurved and beveled rim were classed as Kuaua Glaze Polychrome.) Thus, the type is clearly not exclusively Glaze A, even though Glaze A rims in the majority. As with other local glaze types, the rims range from A to C in shape. A larger proportion of C rims is found for Pottery Mound Glaze Polychrome than for Agua Fria Glaze-on-red, however.

Figure 23. A sherd of Pottery Mound Glaze Polychrome, showing three colors on both sides. Left, interior; Right, exterior.

Figure 24. Additional sherds of Pottery Mound Glaze Polychrome.

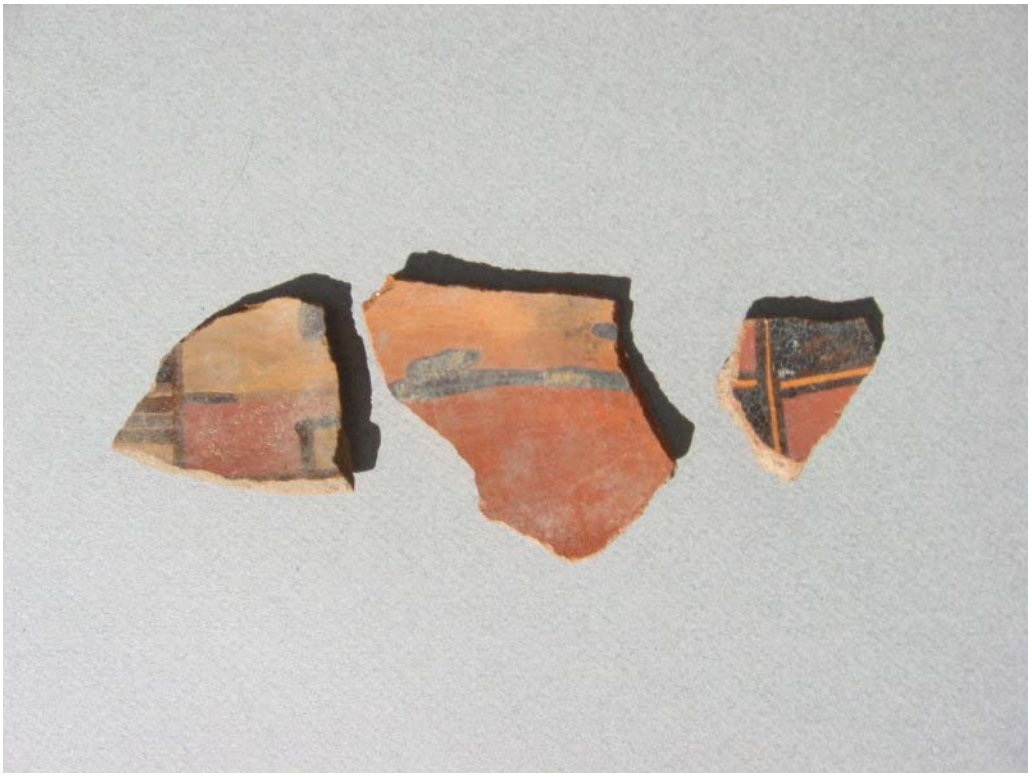

Figure 25. Pottery Mound Glaze Polychrome, tan slip variety.

Figure 26. Pottery Mound Glaze Polychrome, white slip variety.

Vessels are very well formed, slipped and decorated. Attention to detail marks the best examples of the type. Line work is excellent and the glaze does not run. Formerly used only as slips, the colors red and white may enter the design scheme as painted motifs, adding to the overall visual impact. Despite the riot of color and complexity of design, designs typically derive from antecedents in Agua Fria and San Clemente. Banded geometric designs on the interior, together with isolated exterior motifs, are the norm. However, the use of all-over layouts rather than banding increases, as does more extensive use of the bowl exterior for banded as well as isolated designs. This trend away from purely banded layouts can also be seen in late White Mountain Red Ware as well as in the allover style variant of Mesa Verde Black-on-white.

Fairly infrequent, but probably increasing during the life of the type, are stylized life forms. Bird eyes, bird beaks, dragonflies, and other insects are incorporated into an otherwise geometric pattern. The life forms are not as naturalistic as in Mimbres Black-on-white; instead they are highly stylized and geometric. Brody (1964) has remarked on the similarities of these designs to those on contemporary Hopi pottery (of the Jeddito and Sikyatki styles). There is considerable (by Rio Grande standards) Hopi pottery at Pottery Mound, as is well known. Also, some of the murals at Pottery Mound (Hibben 1975) appear to be based on styles used in the Hopi area (Crotty 1995). It is therefore not surprising that the Hopi styles influenced some of the village's ceramic artists. Sweeping diagonal lines, red-filled small irregular areas, bird beaks, parrot or macaw elements, and the use of thin parallel lines are examples of this stylistic influence, and provide a clear example of trade pottery (and possibly other artistic sources) influencing local pottery design.

Nonetheless, "Hopi influence" seems to be limited to a few motifs and to a sub-style of painting within one type, Pottery Mound Glaze Polychrome. It should be remembered that the potters' materials, vessel and rim forms, and firing are otherwise typical for locally made glazewares. Indeed, the "Hopi-like" elements are seen on only a few examples of Pottery Mound Glaze Polychrome, and usually form a minority of the elements and motifs on such pots. It is therefore clear that Pottery Mound Glaze Polychrome is a culmination of the local pottery tradition, in which we see some of the best examples of ceramics from the prehistoric Pueblo world. In reaching this artistic pinnacle, the local artists sometimes worked ideas from Hopi (and probably also from Acoma and Zuni) into their assortment of colors and painted designs.

Pottery Mound Glaze Polychrome was never dominant numerically, even allowing for a sorting process that may have led to some sherds being assigned to other types. (Fragments from some portions of vessel surfaces might have been assigned to glaze-on-red or glaze-on-yellow types.) The type was also not widely traded (Franklin 1997). It seems that the type was never as common as the ones describe earlier. Perhaps it was made by a small number of individuals or for specialized purposes.

San Lazaro Glaze Polychrome

A few polychrome sherds with Glaze D rims were noted from the 1979 test, as well as scattered on the site surface (Figure 27). The sherds have elongated and thickened rims, sometimes in an "S" shape in profile (Figure 13). The lips are no longer beveled or flattened but again rounded.

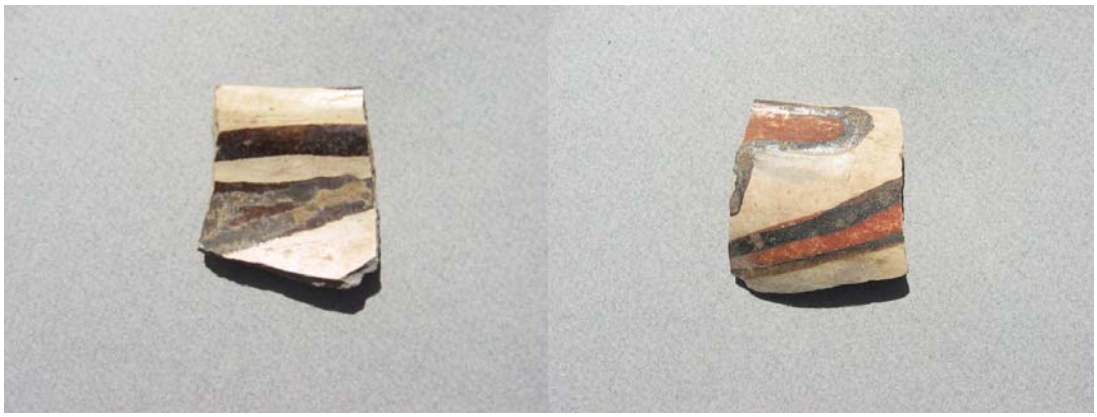

Figure 27. San Lazaro Glaze Polychrome. Left, interior; Right, exterior.

Slip surfaces are tan or fawn or buff-colored. The red and white slips are gone. The painted design consists of red solid elements surrounded by black glaze paint. Lines are often not very straight, paint application is somewhat undisciplined, and the paint tends to be "washed out." Stylistically, the sherds from Pottery Mound conform exactly to the definitions of San Lazaro Glaze Polychrome by Mera (1933:5) and the Eighth Ceramic Seminar (1966:21). From what is currently known, the examples from Pottery appear to be locally made—they have typical local red paste, carbon cores, and basalt temper. Although rare, they indicate that at least part of the site was occupied into Glaze D times, perhaps into the early 1500s.

Discussion

The sequence of glazeware types at Pottery Mound reflects the development of glaze wares across the middle Rio Grande region. The previously defined types comprise a continuous series of varieties, involving changes in slip type and paint placement, painted elements, and rim shapes. Conversely, the consistent use of certain paste clays, tempers, and vessel forms illustrates that some things did not change. Although Pottery Mound is better known for its kiva murals, the site's place among the leading glazeware producing pueblos is secure.

The Pottery Mound glaze wares mostly fall squarely into the regional tradition. The major types have been described at other sites since the time of Kidder, Shepard, and Mera. The local types generally conform to the basic descriptions given in the Eighth Ceramic Seminar (1966), and in the newer guide issued by the Museum of New Mexico (Wilson 2005). At the same time, Pottery Mound Glaze Polychrome and San Clement Glaze Polychrome were much more popular at Pottery Mound than at glazeware sites to the north, reflecting local differences within the glazeware tradition. Similarly, the paucity of Glaze B rims, along with the lack of Espinoso-like polychromes during the Glaze C period, mark a departure from practices to the north.

Variability can also be recognized within most of the types. The local Agua Fria Glaze-on-red was divided between a red variety and an orange-slipped variety, for example. The San Clemente Glaze Polychrome had the most recognized variability, with five sub-types based on slip color

and slip placement. These varieties represent either synchronic variation in ceramic production (by different families, lineages, etc.) or micro-temporal changes in potters' preference.

Pottery Mound Glaze Polychrome represents a clear outgrowth of the preceding types at the site, retaining as it does the paste and temper characteristics of the local pottery. It is the culmination of a long period of development and displays some the best qualities of Pueblo ceramic art. The attention paid to detail, the expressive use of multiple colors, and the quality of the painting are noteworthy. Decorative inspiration from Hopi (and possibly Acoma and Zuni) is evident, and may derive from vessels imported from those western sources.

The Rio Grande glazeware tradition clearly illustrates an unbroken chain from one type into another. Nevertheless, the process of change was not homogenous. Previous design styles coexisted with newer ones. Specifically, the evolution of rims shapes within a named pottery type, with few other concomitant changes, is remarkable and affects our understanding of the locally made types at Pottery Mound. Collectively, the rim forms for the glaze wares range from A to C, with even a few examples of D (see Figures 7–14). At Pottery Mound, however, it is not always possible to equate named types with named rim forms. Instead, for example, "Agua Fria Glaze-on-red" describes an approach to vessel color and painted design that occurs with several of Mera's named rim forms (A, B, and C). The result is a complex typology. Not only were several "types" made concurrently, the evolution of rim shapes did not progress at the same rate as the evolution of broad styles (e.g., black-on-red). Gradual rim changes within several, parallel painting styles pose a taxonomic dilemma.

In this analysis, therefore, the "type" name refers essentially to a design style. Specific design styles may have lasted long enough to include more than one rim profile. Thus, Agua Fria Glaze-on-red has Glaze A rims, predominantly, but smaller numbers of Glaze B and C rims (Mera 1933) are also seen. In the same way, the few examples of B rims in Glaze-on-red and Glaze-on-yellow sherds were not identified as Largo Glaze-on-red or Largo Glaze-on-yellow, unless clearly intrusive based on paste and temper. Nor have the C rim examples been classified as Espinoso Glaze Polychrome unless the sherd is clearly intrusive to Pottery Mound and exhibits all of the Espinoso trademarks.

Persistence of design styles across several rim forms implies parallel production of multiple styles over a considerable period. Indeed, the concurrent production of multiple styles within the same village marks a new development in regional ceramic production. Before the Pueblo IV period, it was typical to produce a single dominant decorated type within a given area and time (for example, Mesa Verde Black-on-white). Now however, concurrent production of multiple styles, some involving external stylistic influence, can be seen. Whether this development is due to production difference among individuals or social groups (Eckert 2003) or owes its origin to different functions within the community, is not known. In any case, the complexity and variability in the ceramic assemblage at Pottery Mound marks a departure from earlier times, and more closely resembles the patterns shown by modern Pueblo pottery.

Chapter 4

NON-LOCAL POTTERY

The tally from the 1979 sample included a considerable amount of painted pottery not made at the site (Table 4). The implications for regional exchange will be treated in Part 2 of this report.

These sherds belong to well-described wares of known origin. In certain cases, however, there is some doubt about the identification of specific types. With small fragments to work with, it is difficult to distinguish Acoma types from each other or from similar Zuni pottery of the same age. Thus, most Acoma and Zuni sherds were combined in this initial count. Likewise, Jeddito and Sikyatki sherds from Hopi may not be separable on the basis of small fragments. If a given sherd is part of a polychrome vessel it is Sikyatki, but if from a black-on-yellow vessel it could be either. In this case the default assignment was to Jeddito. Thus, in many cases catch-all categories were used, including a generalized Acoma-Zuni category (code 830) and a generalized Hopi category (code 870).

All known trade or suspected intrusive sherds were "pulled" during analysis, and will be maintained separately, so that more specific identifications can be made in the future.

Anachronistic (Pre-Pueblo IV) Pottery

While Pottery Mound is a Pueblo IV period glazeware site, Pueblo III period black-on-white pottery from the Rio Grande valley appears with regularity in the deposits. These sherds are non-local in the sense that when they were made, the site presumably did not exist. For example, 76 sherds of Socorro Black-on-white were found (Figure 28). This type typically has fine gray or white paste, fine sherd and rock temper, an unslipped or washed surface, and designs executed in a brownish-black mineral paint.

Accompanying the Socorro are 27 sherds of Los Lunas Smudged, a brownware with smudged bowl interiors and finely done rows of indented corrugations on the bowl exterior.

Socorro can be seen as an outgrowth of the Cibola ceramic tradition, as almost all of the manufacturing attributes are Cibola-Chaco in nature. In contrast, Los Lunas Smudged, made (or at least used) in the same villages as Socorro Black-on-white, has brown paste, smudging, and fine corrugations, all derived from the northern Mogollon ceramic tradition.

This local duality of traditions has puzzled archaeologists for years. Socorro villages extended along the Rio Grande and its tributaries from about Albuquerque to south of the City of Socorro, and up local tributaries including the lower Puerco. Thus, Socorro villages existed in the vicinity of Pottery Mound, both on the lower Puerco itself and along the Rio Grande in the vicinity of Los Lunas and Belen. Thus, it may not be surprising that Socorro Black-on-white, three sherds of Chupadero black-on-white, and Los Lunas Smudged appear in this collection.

Figure 28. Socorro Black-on-white.

Some of the anachronisms may have come from greater distances. A small amount of Cibola series black-on-white pottery was found: one Gallup, five Red Mesa and two Puerco-Escavada. All are from the Cibola-Chaco region to the northwest, though such pottery is not uncommon along the Middle Rio Grande. All three types pre-date Pottery Mound.

At Pottery Mound, the amount of pottery that was no longer being produced is a puzzle. Frank Hibben suspected that there was a Pueblo III component beneath the Pueblo IV village, but was never able to find it. Perhaps the sherds are from heirloom pieces, in which case the movement of people from existing sites to Pottery Mound was an orderly process. Finally, the residents of Pottery Mound may have picked up old sherds on Socorro sites in the vicinity.

Pottery from the Middle-Upper Rio Grande Area

Some sherds belong to the "Biscuit Ware" tradition of carbon-painted pottery, centered on the Rio Grande well north of Pottery Mound. These sherds may have come from the Pajarito Plateau, for example, or from sites on the Chama. In all, 42 sherds of this distinctive ware were identified. They are about equally divided between Biscuit A (Abiquiu Black-on-gray) and Biscuit B (Bandelier Black-on-gray), the latter having exterior decoration (Figure 29).

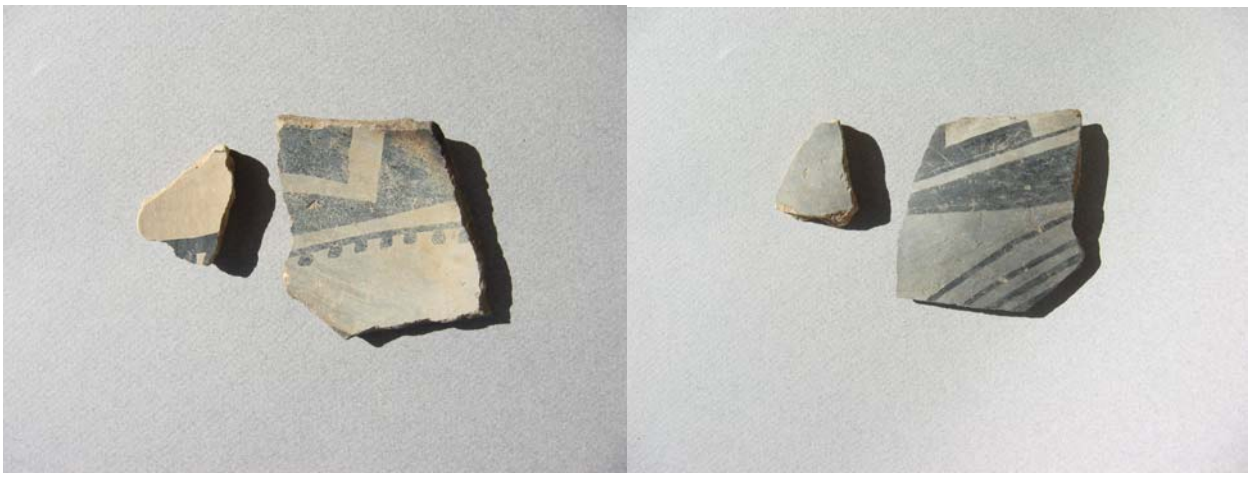

Figure 29. Biscuit wares. Left, Biscuit A (Abiquiu Black-on-white); Right, Biscuit B (Bandelier Black-on-white.

Both types are distinguished by thick walls, a dusty paste, and very fine volcanic tuff temper. Carbon-painted designs over a gray-white slip are a trademark. As these types are well-dated, they are useful for cross-dating. Two sherds that may be Sankawi Black-on-cream. Four red-on-tan sherds may also have come from the northern Rio Grande area. The one sherd of Sapawe Micaceous is from the Chama Valley. In all, 49 sherds are from northern Pueblo sources.

Hopi Pottery

Hopi yellow ware is typified by a yellow paste and surface. The paste is extremely fine, and contains very fine sand and/or potsherd temper. Surfaces are very smooth and evenly polished. Dark brown to black paint is applied with an accuracy rarely equaled in the Southwest. The decorative layouts often have multiple parallel lines, small black or red filled areas, and stylized birds or parts (beaks, eyes) (Fewkes 1973).

The consistent appearance of trade wares from the Hopi mesas has intrigued archaeologists at Pottery Mound for years. The distinctive yellow sherds are easily recognized, and stand out in collections. The Hopi pottery found at Pottery Mound includes Jeddito Black-on-yellow and Sikyatki Polychrome, which were contemporaneous with the site (Figures 30 and 31). Polychrome sherds were assigned to Sikyatki. If a substantial portion of a design was present but was not a polychrome design, the sherd was assigned to Jeddito Black-on-yellow. If the sherd was plain yellow or the surviving portion of the design was small, the sherd was assigned to a generic Hopi yellow ware category (code 870).

The non-painted pottery from Hopi included nine plain yellow utility ware sherds and eight corrugated yellow ware sherds from Hopi (Figure 32). As a pattern on the site, small amounts of utility pottery accompanied painted imports from other areas.

Figure 30. Hopi decorated wares: Top, Sikyatki Polychrome; Bottom, Jeddito Black-on-yellow.

Figure 31. Jeddito Black-on-yellow. Left, jar fragments; Right, handle.

Figure 32. Hopi and Acoma-Zuni corrugated and plainware pottery.

Acoma-Zuni Pottery

The initial identification of Acoma and Zuni sherds was plagued by the close similarities between their types during the Pueblo IV period. Kwakina Glaze Polychrome (1275–1425) and Pinnawa Glaze-on-white (1375–1450) are probably present (Figures 33–35) but are often difficult to separate in small sherds. Both Acoma and Zuni employed a white paste clay with ground potsherds and sometimes crushed rock as well. Tiny pieces of black basalt or red basalt may be present. Slips are bright white and often, at Acoma, thin and chalky. Paints are matte red and glaze black (the latter glossy or greenish).

It was at least possible to assign sherds to a generic Acoma-Zuni group, based on the attributes just described. The 401 sherds in this group constitute a much higher relative frequency than other investigators have found. During the current study, however, all sherds were clipped and examined for paste and temper. On the surface, sherds of the Acoma-Zuni group are sufficiently similar to the local San Clemente Polychrome to be mistakenly typed. This result illustrates (once again) the need to consistently examine paste and temper, rather rely exclusively on surface attributes of sherds.

In addition, 47 plain utility ware sherds and one corrugated sherd assigned an Acoma origin, based on fine white paste and potsherd temper.

Figure 33. Acoma-Zuni glazeware bowl exteriors.

Figure 34. Acoma-Zuni glazeware sherd.

Figure 35. Large Acoma glazeware sherd.

Discussion

Trade wares from four major Pueblo IV period areas were identified in the collection.

The largest amount of trade ware came from the Acoma-Zuni area. Second in popularity was Hopi ware. Biscuit ware and related pottery arrived from the Tewa region to the north. Socorro Black-on-white and Los Lunas Smudged was derived from earlier villages in the Lower Puerco or Middle Rio Grande valleys. Clearly, exchange was widespread at the time Pottery Mound was occupied. Additional trade, within the Rio Grande glazeware realm, is documented via paste and temper analysis and discussed in Part 2 of this report.

Along with decorated types, utility ware appears from afar. It is usually held that trade wares tend to be painted types, as those were presumably more desirable. However, sherds of Micaceous Washboard from the Chama River area, Los Lunas Smudged from the Middle Rio Grande, and confirmed utility types from Acoma and Hopi have been identified. Although not abundant, such sherds demonstrate that trade in unpainted pottery could and did occur.

Chapter 5

UTILITY WARES

Pottery made for cooking or food storage is referred to here as utility ware. Any painted decoration would soon be discolored by cooking fires and other rough treatment. Instead, such wares can be surface textured in some way, or left plain. Southwestern utility ware is routinely manufactured as jars, though bowls are not unknown.

Corrugated Ware

During the Pueblo II and III periods, Pueblo utility jars were almost always textured. In general, plain corrugations (clapboard patterns) were succeeded by finger-impressed corrugation (indented patterns) (Figures 36 and 37). Indentations became shallower through time, and finally were wiped over, leaving only a hint of the original corrugated surface (Figure 38). By the early Pueblo IV period, surface texturing was on its way out, and most utility vessels instead had plain rough surfaces that betrayed no hint of their coiled origins. On vessels with corrugations, the latter were mostly "obliterated" by wiping or smearing. Thus terms such as "obliterated," "smeared," "wiped," and "smeared indented" describe a transition between unambiguously corrugated vessels and unambiguously plain ones. At Pottery Mound, transitional corrugated forms appear in the collection far more frequently than unambiguous clapboard and indented examples. The transitional corrugated examples were most likely the first utility pottery made at the site.

Small amounts of unambiguous clapboard and indented pottery occur, even though such styles should have disappeared by the time the site was first occupied. The tempering materials in the corrugated types are often red or black basalt, typical of manufacturing at Pottery Mound (or at least in the vicinity). However, some corrugated sherds display mica schist temper, typical of vessels made in the Manzano Mountains and Tijeras Canyon areas. Others contain a crushed rock more typical of the Rio Grande Valley. Thus, some use of imported early corrugated pottery can be verified. This accords with the use of early imported decorated pottery, primarily Socorro Black-on-white, as described in Chapter 4.

The corrugated vessels are universally jars (ollas) with flaring rims and rounded lips. They are, in fact, typical of the cooking ware at many contemporary pueblos in the region. Basal portions of the textured vessels were often left plain, so some sherds from the vessels would have been classified as "plain gray" during the analysis.

Plain Utility Ware

Gray utility ware with a plain, rough, or wiped surface was the dominant pottery made during the life of the village (Figure 38).

Figure 36. Utility ware sherds. Top, clapboard corrugated; Bottom, Los Lunas Smudged.

Figure 37. Indented and Obliterated Corrugated.

Figure 38. Plain gray sherds. Left to right: bowl, jar with a straight rim, and jar with an outcurved rim.

As in most pueblos of the time, plain gray pottery was the most frequent type made, perhaps because it was needed the most, or because it often broke during use over a fire.

At Pottery Mound, plain ware occurs in the jar or olla form almost exclusively, but a few bowls were identified from rim sherds. Without a neck or rim sherd, it is usually impossible to tell a plain gray bowl from a jar. All body sherds were classified as jars unless rim sherds indicated otherwise.

The paste of the plain vessels is coarse, but basically the same red-firing paste used in painted wares. Temper is almost exclusively red or black basalt. A few examples show use of sand or crushed non-basaltic igneous rock. Several sherds containing mica schist or other metamorphic rocks probably came from the Tijeras area or somewhere along the Manzano Mountains to the east, where such rocks outcrop.

Surface treatment was probably by smoothing or wiping, though evidence of such activity does not show on exterior surfaces. Those are rough. Interiors may show streaks left by scraping as the pot was thinned.

Plain jars were more or less globular, with a smoothly outcurving neck. Lips are rounded. Smudging and polishing may appear on in neck interior, for a short distance down into the vessel.

Neck shapes show some variation. Most have a smoothly outcurving neck, but some have a fairly straight neck and a straight or slightly flaring lip. There is also continuous variation between the two extremes in neck form. I suspect that there was a trend toward straighter necks through time. Corrugated and smeared-corrugated vessels always had flaring rims, but an increasing number of the plainwares were produced with a straight rim.

In summary, the utility pottery at Pottery Mound displays typical late Pueblo III–Pueblo IV period texturing and shapes. All in all, elaboration and artistic display was reserved for glazeware vessels, while the utility vessels were quite mundane. Most examples of the latter have soot on the exterior, from use over cooking fires. Intentional smudging if vessel interiors is absent, the exception being the intentionally smudged and polished Los Lunas Smudged (a Pueblo III period type of the lower Puerco River area). Los Lunas Smudged undoubtedly originated in the textured ware tradition of the northern Mogollon. Importation of plain and corrugated pottery from several sources—the middle Rio Grande Valley, the Tijeras Pueblo area, Acoma–Zuni, and Hopi—has been verified.

Chapter 6

CHRONOLOGY

As is mentioned in Chapter 2, one goal of the analysis was to clarify the site's chronology, that is, to better establish the beginning and end of occupation and to reveal the sequence of ceramic events in between. At Pottery Mound, existing chronometric evidence consists of pottery types dated elsewhere (ceramic cross-dating) and a few tree-ring dates. The existing information is considered first, followed by an examination of the stratigraphic sequence of types, changes in the rim forms, and seriation of styles and varieties.

Traditionally, the site has been classified as a Glaze A pueblo, with possibly a few Glaze C sherds in the mix. New evidence, provided below, serves to confirm but also extend the site's temporal span.

Dated Pottery Types

One obvious way to determine the age of any site is to identify pottery types that have already been dated elsewhere. "Cross-dating" is commonly used in the Southwest to extend an existing occupation sequence from a known area into an unknown one. All that's needed is firmly dated pottery in an adjacent area. The method's only drawbacks are (1) the accuracy of the associations between dates and pottery in the known area and (2) the assumption that types or styles were contemporaneous across space. The latter assumption has worked well in the Southwest, where design styles spread across large regions fairly quickly (but slight time lags could occur). Obviously, the less distance (and fewer cultural boundaries) between the known area and the unknown, the more secure the projection of dated pottery will be.

Pottery Mound has abundant glazeware and non-glazeware pottery that is well-dated in adjacent areas, and thus may be used to help date the site. Rio Grande Glaze Ware is better documented and better dated in the northern part of its range, near Santa Fe, but those dates can be put to use at Pottery Mound. Likewise, the village has yielded a variety of pottery from adjacent regions, most of it adequately dated in its home area. Thus, the site's glaze types dated elsewhere, together with intrusive types dated in their areas of origin, provide two lines of evidence for ceramic cross-dating. Summaries of the known dates are found in the report of the Eighth Ceramic Seminar (1966), in Oppelt (2002), and in the Laboratory of Anthropology's Technical Bulletin No. 12 (Wilson 2005).

Glazeware Dates

Table 1 shows the glazeware types' presumed place in the time sequence. These "traditional" dates are ones that have been used in previous work, most of which has taken place in the Santa Fe-Galisteo Basin areas to the north. Those dates may be extrapolated, for the most part, to the Middle Rio Grande Valley and Pottery Mound. There have been suggestions, however, that the

local developmental sequence did not mirror that of the northern glazes, when viewed closely. For now, it will be assumed that the given dates "fit" at Pottery Mound. Thus, Glaze A dates from 1315 to 1425, Glaze B from 1425 to 1450, and Glaze C from 1450 to 1490.

Based on the traditional diagnostic attribute—rim form—the glazeware pottery at Pottery Mound falls largely in the Glaze A horizon, though a few B and somewhat more C rims are present. Thus, the major types at the site (Agua Fria Glaze-on-red, San Clemente Glaze Polychrome, and Pottery Mound Polychrome) have typically been placed in Glaze A (Eighth Southwest Ceramic Seminar 1966), while Pottery Mound itself is traditionally designated a "Glaze A" site. While some doubt existed about the status of Pottery Mound Glaze Polychrome, which was seen as Glaze A but possibly later (Eighth Southwest Ceramic Seminar 1966), the traditional dates for Rio Grande Glaze Ware suggest that the occupation of Pottery Mound lasted from as early as 1315 to 1450 or perhaps later.

Dated Non-local Types

Table 1 shows the time spans of the non-local types found at Pottery Mound. Many of these types are well dated in their areas of origin, so their appearance at this site offers an excellent opportunity for ceramic cross-dating. In Table 1 the White Mountain Red Ware types are listed for reference purposes but are essentially absent at Pottery Mound. No verified sherds of St. Johns Polychrome or Heshotauthla Polychrome were found during this analysis. This absence may be significant, because Pottery Mound may not have been in existence during the period when Rio Grande Glaze Ware developed, roughly between 1275 and 1315. While there is little doubt that Rio Grande Glaze Ware derives from White Mountain Red Ware prototypes, those prototypes were not present as the village took form.

In addition, examples of the first locally made glazeware pottery, Los Padillas and Arenal Glaze Polychrome, are extremely rare at Pottery Mound . This earliest manifestation of local glazeware was brief, perhaps lasting only from 1280 to 1325. Thus, the lack of glazeware precursors and virtual lack of the earliest glaze types suggest that the site was not occupied until 1325 or slightly later.

To the north, Glaze B is dated between 1400 or 1425 and 1450. At Pottery Mound the local pottery includes very few Glaze B rims, though it is clear that the site was in use during this period. Furthermore, almost no intrusive Glaze B rims are found at the site. Glaze B does not exist as a separable phase at Pottery Mound, or perhaps anywhere along the lower Middle Rio Grande. The characteristic flattened or bulbous lips, on expanding rims, never caught on locally. Instead, production of C type rims began on the heels of (more likely, during) the production of A rims.

Glaze C is fully represented at the site, as is evidenced by the abundant C type rims on local glaze types (especially Pottery Mound and Kuaua Glaze Polychrome). Thus, the continued occupation of the site into the Glaze C period is undoubted. Trade pottery from elsewhere in the Glaze C production area is minimal, however. The analysis identified several probable Espinoso Glaze Polychrome sherds. These are marked by a light yellow paste and a diorite or latite

(igneous) rock temper, both foreign to Pottery Mound. The presence of a few Espinoso sherds helps establish continued occupation during Glaze C, possibly until about 1500. As with the Glaze B intrusives, however, there seems to have been little importation of Rio Grande glazewares during Glaze C. Evidence for trade is discussed more fully in the forthcoming second part of this report.

A small amount of Kuaua Glaze Polychrome was produced at Pottery Mound. The type is not well dated, but was classed as a variant of Espinoso Glaze Polychrome by the Eighth Southwestern Ceramic Seminar (1966). Estimates of the dates extend from 1425 or 1450 until 1525 or even 1550. Here, Kuaua is considered to a variant of San Clemente, rather than of Espinoso. A few of the Kuaua sherds at Pottery Mound contain non-local temper, suggesting an origin at some other site in the Middle Rio Grande Valley. Although the assigned dates are not as precise as one might wish, the local and intrusive Kuaua Polychrome suggests continued occupation of the site as late as 1500 or even 1525.

The occurrence of Socorro Black-on-white and its companion Los Lunas Smudged, in some quantity (Table 4), is difficult to explain. If Pottery Mound began about 1325, and lacks the earliest glazewares, no Pueblo III (pre-1300) pottery should be found. The amounts of these two types, together with the occurrence of Clapboard and Indented Corrugated, could be explained in several ways.

1. The Pueblo III Socorro complex may have lasted beyond A.D. 1300 (by as much as a couple of generations).

2. The Socorro black-on-white, Los Lunas smudged, etc. represent heirlooms brought to the site when it was founded about 1325.

3. There may have been a local Socorro phase occupation, either under the glazeware levels at Pottery Mound or very close by.

Of these possible explanations, the third is favored here. The cultural eclipse of black-on-white production by a massive wave of glazewares is evident at many sites in the area (Eckert 2003). It is unlikely that Socorro Black-on-white, in particular, was made past 1300. The maintenance of heirlooms is possible but would typically involve only a small number of vessels. Thus, a pre-glazeware, Socorro occupation at or near the site is far more likely. Pit house villages of the late Pueblo III period are documented for the area surrounding Pottery Mound (Eidenbach 1982; Wimberley and Eidenbach 1980). All in all, the local presence of Socorro pottery, combined with the lack of evidence for the earliest phase of regional glazeware development, suggests an occupational hiatus along the local stretch of the Rio Puerco, between 1280 or 1290 to about 1325.

Intrusive pottery from the Biscuit Ware region is regularly seen at Pottery Mound. Both Biscuit A and Biscuit B are present, in about equal amounts (Table 4). These types are quite well dated in their homeland, which extends from Cochiti Reservoir and Bandelier National. Monument on the south to the lower Chama river on the north. Huge sites in this area give evidence of a massive occupation between about 1375 and 1500. Indeed, Biscuit B is dated to as late as 1550

(Table 1). A couple of sherds even displayed characteristics of the later Sankawi Black-on-cream, which reaches the onset of the Spanish Colonial period at 1600. A sherd of Sapawe Micaceous and a possible Potsuwii Incised give evidence of contact as far north as the villages of the Chama Valley. Thus, readily identifiable and well dated pottery shows that Pottery Mound could have been occupied as late as 1500, and perhaps slightly later.

Extensive trade with the Acoma-Zuni area has been identified (Table 4), but the exact pottery types are difficult to discern. Based on incomplete data, the dates for Kwakina Glaze Polychrome (1275 to 1425) overlap with the presumed early occupation of Pottery Mound. The dates for Pinnawa Glaze-on-white (1375 to 1450) fall entirely within the site's estimated life span.

Two Hopi wares are present, Jeddito Black-on-yellow (1350 to 1450) and Sikyatki Polychrome (1400 to 1625). The former corresponds to the early years of the site occupation, while the latter corresponds to the later years, but they are often found together in the deposits. Date of importation may not have coincided with date of manufacture, and heirloom retention is a strong possibility. In any case, the Hopi types suggest a site beginning no earlier than 1350 and an ending before 1650. Continuous importation of Hopi yellow ware over such a long distance is a remarkable feature of Pottery Mound's history.

Except for the pre-1300 Socorro complex materials, the non-local types are helpful in establishing the temporal boundaries of the occupation at Pottery Mound. Several types strongly indicate that 1325 is a reasonable starting date for the site. The ending date is more problematic but based on several intrusive types, continued occupation until at least 1500 is a possibility. Specifically, Biscuit B, Sankawi Black-on-cream, Kuaua Glaze Polychrome, Pinnawa Glaze-on-white, and Sikyatki Polychrome all continued to 1500 or later.

Glaze D (San Lazaro Glaze Polychrome) is generally given dates of 1490 to 1525, perhaps later. Given the minor quantities of locally produced Glaze D rims at the site, the site was depopulated no earlier than 1470. If we assume that a single generation is responsible for the Glaze D rims, the end of the occupation is pushed to at least 1490. If the Glaze D production was instead due to a small relict population (such as a few extended families), over several generations, the end of the site could have come about 1500 or even later. Thus, while the site may have lain empty by 1500, the possibility of continued occupation beyond that year cannot be ruled out.

Type Frequencies

Quantitative data are of assistance in many aspects of interpretation. Here, the frequencies and percentages of various types may give us a better idea of varying pottery production and use (and thus, indirectly, intensity of occupation) over time.

Pottery Mound is generally characterized as a Glaze A site, so we should expect to find an abundance of Glaze A types. This is generally the case, inasmuch as Agua Fria, Cieneguilla, and San Clemente are all thought of as Glaze A. Even Pottery Mound Glaze Polychrome is traditionally considered a Glaze A type, albeit one that persists beyond the Glaze A period. (It will later be shown that Glaze C rims appear in all these types.) So how frequent are these types?

Based on Table 4, 51.6 percent of the sherd count for the 1979 test is glazeware. It is unusual for even a third of the pottery at prehistoric pueblos to be painted. Although the ratio of painted pottery in sites increased from Pueblo II to Pueblo IV, Pottery Mound stands out in this respect. Clearly, huge amounts of glazeware were produced and consumed at the site.

Within the glazeware, Agua Fria is the most common, 77.0 percent of the glazeware sherds. Second is San Clemente (including Kuaua Polychrome) with 14.4 percent. This latter figure is for the type as a whole, including its eight varieties (Table 4).

Dropping way down, Cieneguilla Glaze-on-yellow accounts for 4 percent of the glazeware sherds. The type was not very popular at Pottery Mound, and may have died out during the life span of the site. Pottery Mound Glaze Polychrome accounts for only 3.5 percent of the glazeware sherds. The count probably under-represents the type, however, due to sorting bias: its distinctive polychrome combination does not show up on all parts of a bowl, and basal sherds are often monochrome or bichrome.

Glaze B types are almost non-existent. A few trade pieces came in, and a few local glaze-on-red sherds show a flattened or club-like rim form typical of Glaze B. Only eight sherds (0.04 percent) were Glaze B intrusives, however. Glaze B is thus almost absent, but there is every reason to believe that the site was occupied during the Glaze B period (ca. 1400–1450). The B type rim forms simply did not become popular in the southern glazeware region.

Glaze C intrusive types (Espinoso Glaze Polychrome) are uncommon, but the major local A types (defined on design styles) persisted into C times, as shown by typical C type rims on some of them. Within the local types of Agua Fria, San Clemente and Pottery Mound, defined in terms of paint style, Glaze C rims are not uncommon. Thus, although imports of Glaze C pottery from other districts were infrequent, the rims forms were known at Pottery Mound and were widely used by the local potters. In other words, the Glaze C period is evidenced not so much by imported glazewares as it is by the adoption of typical Glaze C rim forms on the same local types that had displayed (and continued to display) Glaze A rim forms. Contact with the wider glazeware world is evident, despite the dearth of verified glazeware intrusives.

In the 1979 test pit collection, Glaze D is represented by only 6 sherds of San Lazaro Glaze Polychrome. Other Glaze D rims have been noted recently on the surface of the mound and at the northeast end of the site. This type, made between about 1490 and 1525, clearly shows that pottery was still being deposited at a time when, by many accounts, the site lay empty.

Judging by these numbers, Agua Fria and San Clemente were by far the most popular types (Table 4). Cieneguilla was never very popular, and its use seems to have declined with time. Pottery Mound Glaze Polychrome, despite its fame, is a minor part of the local glazeware tradition. While its low numbers may be partly due to sorting bias, they may also be indicative of the restricted manufacture, and perhaps specialized function, of this elaborate type.

Unpainted utility pottery—used for cooking, storage, and perhaps transport—is the largest single ceramic category at most prehistoric pueblos. Here, 46.3 percent of all pottery is utility ware.

The fact that the utility category is less than half the total reflects the huge emphasis on glazeware production. In Pueblo II and Pueblo III times, utility pottery generally accounts for 70 to 90 percent of all pottery.

Corrugated styles were being phased out as Pottery Mound was occupied, but they still appear in a minor role. The Pueblo II and III styles of plain corrugated, clapboard corrugated, and indented corrugated still appear. Clapboard (51) and Indented (122) date before 1300 but, like the Pueblo III type Socorro Black-on-white, are undeniably present (Table 4). As the final expression of surface texturing, obliterated or smeared corrugated mark the transition to the completely obliterated plainwares characteristic of Pueblo IV. In all, 152 sherds date from the period in which corrugations were increasingly wiped, smeared, and finally (about 1325) eliminated.

The largest single category is plain gray utility, showing no texturing. The 17,781 sherds of this description are the most numerous class by far. Made almost completely in the form of large jars or ollas, such plainware is rarely found in bowl form (Table 4).

A few sherds (n=20) had a micaceous paste, resulting from the use of micaceous rocks as temper. (By surface inspection alone, the plain gray sherds with micaceous paste are difficult to distinguish from basalt-tempered sherds originating at Pottery Mound.) Metamorphic outcrops that could provide micaceous clay or temper are known from the Sandia and Manzano Mountains, about 65 km to the east., but no mica is available in the site vicinity. The micaceous pastes thus represent imported utility pottery, perhaps from a village such as Tijeras Pueblo at the south end of the Sandias (Cordell 1980a). Here again, trade in undecorated ceramics is evident—importation of utility pottery from Acoma and Hopi was already mentioned.

Dendrochronology

Four independent dates have been obtained from Pottery Mound; all are tree-ring dates. According to Phillips and Ballagh (2004:14) and Eckert (2003:36), the dates were on specimens from the Hibben field schools. At the time, 318 wood specimens were recovered, all but six of which were juniper and cottonwood, which rarely provide tree-ring dates. The four specimens that could be dated are:

V 1411 from Kiva 6, pine
V 1427 from Kiva 6, pine
V 1418 from trash near Kiva 10, piñon
V 1381 from trash in fill on pyramid, piñon

These dates should be viewed with some caution, as none are outer ring (cutting) dates, and their functional contexts (construction vigas, firewood, etc.) are unknown. Nonetheless, they suggest a pattern of construction and site use during the period of 1381+ to 1427+, or 46 years. Usually, a small sample of tree-ring dates pertains to the construction of room blocks, kivas, etc., and does not indicate the full length of occupation. In other words, these samples are most likely from early in the life of the village.

Stratigraphic Sequence

The 1979 test of the site's northern midden allows us to examine an in situ pottery sequence. The question is, can we verify the sequence indicated by the established dates for such pottery, based on work elsewhere (Tables 1 and 2)? Judging by the accepted sequence from Glaze A through Glaze F (Mera 1933, 1940; see also Eighth Ceramic Conference 1966), we would expect the pottery types from the 1979 stratigraphic test to appear in the following approximate order: Los Padillas and Arenal, Agua Fria and Cieneguilla, San Clemente, Pottery Mound, Kuaua, and San Lazaro. Bearing in mind that the sequence may vary somewhat on the Lower Puerco, this sequence is a plausible initial model or hypothesis. We may now see whether this sequence is borne out by the stratigraphic data.

The stratigraphic distribution of types and varieties is shown in Tables 5 and 6. Table 5 includes all types and varieties; Table 6 extracts the decorated pottery and re-computes percentages relative to that subgroup. In both tables, the 20 cm excavation levels are numbered from 0 (surface) to 17 (deepest). Percentages in both tables are computed relative to the totals for levels.

The test excavation was carried down to apparently sterile soil, which was encountered 3.5 m below the modern ground surface. I have assumed that the trash is representative of the life span of the pueblo. There may, of course, be other middens at the site that could yield a more complete series, but if so, they have not been identified. For all levels except the lowest ones (which were exposed in only two of the four quadrants), sample sizes are adequate for numerical analysis.

On initial inspection, Tables 5 and 6 show considerable overlap between many of the major pottery types. Indeed, most types occur in most levels. This overlap will be addressed below. At present, the need is to determine whether there are significant trends in the sequence despite this overlap. In any case, such trends are to be expected; while it would be convenient if potters suddenly abandoned one set of attributes in favor of a completely different set, pottery types and styles almost never start or stop abruptly. Instead, as long as the resident population remains intact, ceramics evolve over time. Thus, "layer cake" models of ceramic change are unrealistic. We should look for quantitative trends, rather than expect drastic changes in production.

Local Decorated Pottery

With these comment in mind, the data in Table 6 may be examined for trends that indicate the expected glazeware ceramic trajectory exists at Pottery Mound. The key pottery types do, in fact, reveal consistent trends through the 17 test levels.

The earliest Rio Grande Glaze Ware types (Los Padillas and Arenal) are few (17), and Pottery Mound was probably built after these types were made. Their occasional presence in a post-production environment may not be significant. Table 6 shows that they are most common well down in the sequence, in Level 11. In fact, most of the sherds (n=12) occur between Levels 7 and 11. Nine occur in Level 10 or lower. Despite some possible redeposition, these types do fall early in the midden's depositional history.

Table 5. All Pottery Types by Level.

(Levels 9–17 are listed below Levels 0–8.)

Pottery Type	Code	Count	0 Surf.	% of 0	Level 1	% of 1	Level 2	% of 2	Level 3	% of 3	Level 4	% of 4	Level 5	% of 5	Level 6	% of 6	Level 7	% of 7	Level 8	% of 8
Not code number		2							2	0.1										
Red Mesa B/W	10	5					4	0.1												
Puerco-Escavada B/W	11	2																	2	0.2
Socorro B/W	12	76			4	0.0	6	0.1	1	0.0	5	0.2	4	0.1	7	0.4	2	0.2		
Chupadero B/W	13	3			2	0.0	1	0.0												
Santa Fe B/w	15	3			1	0.0	2	0.0												
Biscuit A (Abiquiu) B/W	25	22			4	0.0	1	0.0	4	0.2			1	0.0	4	0.3	1	0.1	2	0.2
Biscuit B (Bandelier) B/W	30	20	2	0.9			7	0.1	5	0.2	1	0.0	1	0.0	2	0.1				
Sankawi B/Cream	71	2											1	0.0	1	0.1				
Red/tan	83	4					3	0.0												
Unpainted red	91	6704	31	14.3	1231	14.5	1517	22.0	433	18.3	332	16.1	487	15.0	259	16.5	101	10.7	104	10.8
Unpainted red/white	92	165			22	0.3	73	1.1			14	0.7	30	0.9			9	1.0	10	1.0
Unpainted white/white	93	220	2	0.9	21	0.2	62	0.9	30	1.3	2	0.1	13	0.4	2	0.1	23	2.4	9	0.9
Unpainted orange/red	96	70			60	0.7	6	0.1												
Unpainted generic glaze	97	1002			797	9.4					2	0.1	80	2.5			46	4.9	77	8.0
Glaze A NFS	100	8			2	0.0	1	0.0										0.0		
Los Padillas G/Poly	101	2			2	0.0														
Arenal G/Poly	105	15			1	0.0					4	0.2					1	0.1		
Los Padillas-Arenal G/Poly	106	1			1	0.0														

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(Levels 9–17 are listed below Levels 0–8.)

Pottery Type	Code	Count	0 Surf.	% of 0	Level 1	% of 1	Level 2	% of 2	Level 3	% of 3	Level 4	% of 4	Level 5	% of 5	Level 6	% of 6	Level 7	% of 7	Level 8	% of 8
Agua Fria G/R, red slip	110	4575	37	17.1	741	8.7	777	11.3	254	10.7	291	14.1	373	11.5	159	10.1	123	13.0	182	18.8
Agua Fria G/R, orange slip	111	3075	55	25.3	528	6.2	568	8.2	226	9.6	265	12.8	358	11.0	147	9.3	76	8.1	89	9.2
Agua Fria G/Poly	112	3															3	0.3		
San Clemente G/Poly, red ext., chalky white int.	115	434			53	0.6	59	0.9	37	1.6	36	1.7	27	0.8	20	1.3	13	1.4	10	1.0
San Clemente G/Poly, red ext., creamy white int.	116	1077	9	4.1	169	2.0	223	3.2	120	5.1	70	3.4	81	2.5	61	3.9	31	3.3	18	1.9
San Clemente G/Poly, chalky white ext., red int.	117	772	5	2.3	79	0.9	133	1.9	63	2.7	58	2.8	73	2.3	46	2.9	21	2.2	46	4.8
San Clemente G/Poly, creamy yellow ext., red int.	118	118	3	1.4	52	0.6	22	0.3			3	0.1	10	0.3	1	0.1	4	0.4	5	0.5
San Clemente G/Poly, white or creamy both sides	119	69			9	0.1	5	0.1	11	0.5	3	0.1	17	0.5	4	0.3				
Cieneguilla G/Y	120	777	8	3.7	105	1.2	161	2.3	57	2.4	63	3.1	105	3.2	27	1.7	25	2.7	22	2.3
Cieneguilla G/Poly	121	16	1	0.5	3	0.0	4	0.1	1	0.0	2	0.1			2	0.1				
Pottery Mound G/Poly, NFS	125	12	1	0.5	1	0.0					9	0.4								
Pottery Mound G/Poly, tan, buff, or olive slip	126	509	12	5.5	128	1.5	160	2.3	39	1.7	35	1.7	40	1.2	32	2.0	10	1.1	21	2.2
Pottery Mound G/Poly, chalky white slip	127	175	1	0.5	16	0.2	37	0.5	9	0.4	18	0.9	23	0.7	4	0.3	7	0.7	15	1.6

Table 5. All Pottery Types by Level.

(Levels 9–17 are listed below Levels 0–8.)

Pottery Type	Code	Count	0 Surf.	% of 0	Level 1	% of 1	Level 2	% of 2	Level 3	% of 3	Level 4	% of 4	Level 5	% of 5	Level 6	% of 6	Level 7	% of 7	Level 8	% of 8
Pottery Mound G/Poly, red on white	130	1					1	0.0												
Largo G/Y	201	8			1	0.0			3	0.1					1	0.1	2	0.2		
Espinosa G/Poly	301	1			1	0.0														
Kuaua G/Poly, in part	302	16							12	0.5					4	0.3				
Glaze D, NFS	400	2							1	0.0					1	0.1				
San Lazaro G/Poly	401	4	1	0.5	1	0.0							1	0.0	1	0.1				
Unknown late glaze	640	1					1	0.0												
Clapboard Corr.	701	51			2	0.0	5	0.1	1	0.0	4	0.2	6	0.2	2	0.1	1	0.1		
Indented Corr.	705	122	2	0.9	29	0.3	11	0.2	1	0.0	5	0.2	7	0.2			3	0.3	2	0.2
Obliterated/smeared Corrugated	706	152			13	0.2	24	0.3	10	0.4	6	0.3	9	0.3	15	1.0	5	0.5	2	0.2
Plain gray utility	710	17426	45	20.7	4286	50.3	2901	42.0	994	42.1	802	38.9	1440	44.4	737	46.8	414	43.9	329	34.0
Plain gray utility, micaceous paste	715	10			2	0.0	3	0.0			1	0.0			3	0.2				
Los Lunas Smudged	725	27	1	0.5	2	0.0	8	0.1	1	0.0			1	0.0					4	0.4
Sapawe Micaceous Washboard	730	1					1	0.0												
Cibola-Acoma plainware	740	47			17	0.2	2	0.0	7	0.3	1	0.0			4	0.3				
Unknown plain utility	750	1																		
Unknown plain utility	799	20			15	0.2	5	0.1												
Gallup B/W	805	1																		
Kwakina G/Poly (Zuni)	810	2					1	0.0												

Table 5. All Pottery Types by Level.

(Levels 9–17 are listed below Levels 0–8.)

Pottery Type	Code	Count	0 Surf.	% of 0	Level 1	% of 1	Level 2	% of 2	Level 3	% of 3	Level 4	% of 4	Level 5	% of 5	Level 6	% of 6	Level 7	% of 7	Level 8	% of 8
Acoma-Zuni glaze, NFS	830	350	1	0.5	70	0.8	59	0.9	18	0.8	12	0.6	31	1.0	19	1.2	10	1.1	10	1.0
Acoma-Zuni glaze, NFS	831	1											1	0.0						
Jeddito B/Y	850	94			11	0.1	12	0.2	17	0.7	12	0.6	8	0.2	5	0.3	3	0.3	2	0.2
Sikyatki Poly	860	17					6	0.1	1	0.0	3	0.1	4	0.1	1	0.1				
Hopi painted yellow ware, NFS	870	111			30	0.4	24	0.3	5	0.2	5	0.2	10	0.3	2	0.1	2	0.2	6	0.6
Hopi utility, plainware	880	9			2	0.0							1	0.0	1	0.1	1	0.1		
Hopi utility, corrugated	881	8			1	0.0	2	0.0									3	0.3		
Unidentified	999	8					5	0.1									3	0.3		
Total		38429	217	100.0	8515	100.0	6903	100.0	2363	100.0	2064	100.0	3243	100.0	1574	100.0	943	100.0	967	100.0

Table 5. All Pottery Types by Level.

(Levels 0–8 are listed above Levels 9–17.)

Pottery Type	Level 9	% of 9	Level 10	% of 10	Level 11	% of 11	Level 12	% of 12	Level 13	% of 13	Level 14	% of 14	Level 15	% of 15	level 16	% of 16	Level 17	% of 17
No code number																		
Red Mesa B/W																	1	0.6
Puerco-Escavada B/W																		
Socorro B/W	4	0.2	11	0.4	11	0.4	9	0.5	7	0.5			1	0.3	4	1.1		

Table 5. All Pottery Types by Level.

(Levels 0–8 are listed above Levels 9–17.)

Pottery Type	Level 9	% of 9	Level 10	% of 10	Level 11	% of 11	Level 12	% of 12	Level 13	% of 13	Level 14	% of 14	Level 15	% of 15	level 16	% of 16	Level 17	% of 17
Chupadero B/W																		
Santa Fe B/W																		
Biscuit A (Abiquiu) B/W			1	0.0	3	0.1	1	0.1										
Biscuit B (Bandelier) B/W			1	0.0	1	0.0												
Sankawi B/Cream																		
Red/tan	1	0.1																
Unpainted red	347	21.3	504	16.8	484	18.3	361	22.0	273	19.2	83	17.2	52	17.6	74	21.2	31	17.7
Unpainted red/white	2	0.1					4	0.2									1	0.6
Unpainted white/white	7	0.4	9	0.3	28	1.1	3	0.2	2	0.1	5	1.0	1	0.3	1	0.3		
Unpainted orange/red	4	0.2																
Unpainted glaze NFS																		
Glaze A NFS	3	0.2			2	0.1												
Los Padillas G/Poly																		
Arenal G/Poly			1	0.0	7	0.3							1	0.3				
Los Padillas-Arenal G/Poly																		
Agua Fria G/R, red slip	188	11.5	413	13.8	315	11.9	291	17.7	263	18.5	64	13.3	36	12.2	50	14.3	18	10.3
Agua Fria G/R, orange slip	122	7.5	204	6.8	175	6.6	121	7.4	86	6.0	22	4.6	18	6.1	15	4.3		
Agua Fria G/Poly																		
San Clemente G/Poly, red ext. chalky white int.	38	2.3	36	1.2	56	2.1	16	1.0	16	1.1	8	1.7	3	1.0	4	1.1	2	1.1

Table 5. All Pottery Types by Level.

(Levels 0–8 are listed above Levels 9–17.)

Pottery Type	Level 9	% of 9	Level 10	% of 10	Level 11	% of 11	Level 12	% of 12	Level 13	% of 13	Level 14	% of 14	Level 15	% of 15	level 16	% of 16	Level 17	% of 17
San Clemente G/Poly, red ext. creamy white int.	59	3.6	90	3.0	44	1.7	45	2.7	34	2.4	6	1.2	7	2.4	5	1.4	5	2.9
San Clemente G/Poly, chalky white ext., red int.	23	1.4	120	4.0	37	1.4	27	1.6	31	2.2	5	1.0	5	1.7				
San Clemente G/Poly, creamy yellow ext., red int.	5	0.3	2	0.1	6	0.2	4	0.2					1	0.3				
San Clemente G/Poly, white or creamy both sides	1	0.1	9	0.3	4	0.2	1	0.1	3	0.2	2	0.4						
Cieneguilla G/Y	42	2.6	40	1.3	53	2.0	39	2.4	12	0.8	4	0.8	6	2.0	4	1.1	4	2.3
Cieneguilla G/Poly									1	0.1							2	1.1
Pottery Mound G/Poly, NFS	1	0.1																
Pottery Mound G/Poly, tan, buff, or olive slip	8	0.5	3	0.1	13	0.5	3	0.2	4	0.3	1	0.2						
Pottery Mound G/Poly, chalky white slip	21	1.3	5	0.2	9	0.3	3	0.2	6	0.4					1	0.3		
Pottery Mound G/Poly, red on white																		
Largo G/Y					1	0.0												
Espinosa G/Poly																		
Kuaua G/Poly, in part																		
Glaze D, NFS																		
San Lazaro G/Poly																		

Table 5. All Pottery Types by Level.

(Levels 0–8 are listed above Levels 9–17.)

Pottery Type	Level 9	% of 9	Level 10	% of 10	Level 11	% of 11	Level 12	% of 12	Level 13	% of 13	Level 14	% of 14	Level 15	% of 15	level 16	% of 16	Level 17	% of 17
Unknown late glaze																		
Clapboard Corr.	3	0.2	1	0.0	10	0.4	4	0.2	8	0.6	3	0.6			1	0.3		
Indented Corr.	5	0.3	12	0.4	8	0.3	8	0.5	16	1.1	1	0.2	4	1.4	5	1.4	3	1.7
Obliterated/Smeared Corr.	9	0.6	16	0.5	13	0.5	7	0.4	5	0.4	8	1.7	2	0.7	8	2.3		
Plain gray utility	722	44.3	1467	48.9	1324	50.0	660	40.2	622	43.7	256	53.1	152	51.5	171	49.0	104	59.4
Plain gray utility, micaceous paste																	1	0.6
Los Lunas Smudged			1	0.0	3	0.1	5	0.3			1	0.2						
Sapawe Micaceous Washboard																		
Cibola-Acoma plainware	1	0.1	4	0.1			8	0.5			2	0.4	1	0.3				
Unknown plain utility							1	0.1										
Unknown plain utility																		
Gallup B/W					1	0.0												
Kwakina G/Poly (Zuni)																	1	0.6
Acoma-Zuni glaze, NFS	9	0.6	33	1.1	24	0.9	16	1.0	18	1.3	8	1.7	4	1.4	6	1.7	2	1.1
Acoma-Zuni glaze, NFS																		
Jeddito B/Y	1	0.1	8	0.3	4	0.2	2	0.1	9	0.6								
Sikyatki Poly					2	0.1												
Hopi yellow ware painted, NFS	2	0.1	10	0.3	5	0.2	2	0.1	5	0.4	3	0.6						
Hopi utility plainware					2	0.1	1	0.1					1	0.3				

Table 5. All Pottery Types by Level.

(Levels 0–8 are listed above Levels 9–17.)

Pottery Type	Level 9	% of 9	Level 10	% of 10	Level 11	% of 11	Level 12	% of 12	Level 13	% of 13	Level 14	% of 14	Level 15	% of 15	level 16	% of 16	Level 17	% of 17
Hopi utility, corr.					1	0.0			1	0.1								
Unidentified																		
Total	1628	100.0	3001	100.0	2646	100.0	1642	100.0	1422	100.0	482	100.0	295	100.0	349	100.0	175	100.0

Table 6. Decorated Pottery Types by Level.

(Levels 9–17 are listed below Levels 0–8.)

Pottery Type	Count	% of count	0, Surf.	% of 0	Level 1	% of 1	Level 2	% of 2	Level 3	% of 3	level 4	% of 4	Level 5	% of 5	Level 6	% of 6	Level 7	% of 7	Level 8	% of 8
Rio Grande Glaze Ware																				
Los Padillas-Arenal G/Poly	21	0.1			4	0.1					4	0.3					4	0.8		
Agua Fria G/R, red slip variety	4575	22.3	37	21.9	741	17.9	777	19.7	254	18.8	291	23.4	373	21.0	159	19.6	123	23.8	182	28.9
Agua Fria G/R, orange slip variety	3075	15.0	55	32.5	528	12.7	568	14.4	226	16.8	265	21.3	358	20.1	147	18.1	76	14.7	89	14.1
Cieneguilla G/Y	777	3.8	8	4.7	105	2.5	161	4.1	57	4.2	63	5.1	105	5.9	27	3.3	25	4.8	22	3.5
Cieneguilla G/Poly	16	0.1	1	0.6	3	0.1	4	0.1	1	0.1	2	0.2			2	0.2				
Largo B/Y	8	0.0			1	0.0			3	0.2					1	0.1	2	0.4		
San Clemente G/Poly, all vars.	2470	12.0	17	10.1	362	8.7	442	11.2	231	17.1	170	13.7	208	11.7	132	16.3	69	13.4	79	12.5
Pottery Mound G/Poly, all vars.	697	3.4	14	8.3	145	3.5	198	5.0	48	3.6	62	5.0	63	3.5	36	4.4	17	3.3	36	5.7
Kuaua G/Poly	16	0.1							12	0.9					4	0.5				
Espinoso G/Poly	1	0.0			1	0.0														
Glaze D, San Lazaro G/Poly	7	0.0	1	0.6	1	0.0	1	0.0	1	0.1			1	0.1	2	0.2				
Rio Grande Glaze Ware, Unpainted																				
Plain red	6704	32.6	31	18.3	1231	29.7	1517	38.5	433	32.1	332	26.7	487	27.4	259	31.9	101	19.6	104	16.5
Plain orange	70	0.3			60	1.4	6	0.2												
Red/white or white/red	385	1.9	2	1.2	43	1.0	135	3.4	30	2.2	16	1.3	43	2.4	2	0.2	32	6.2	19	3.0
Unpainted from glazewares, NFS	1010	4.9			799	19.3	1	0.0			2	0.2	80	4.5			46	8.9	77	12.2
Black-on-white Types, Biscuit Ware, Red-on-tan																				
Red Mesa, Puerco, Gallup B/W	10	0.0					4	0.1	2	0.1									2	0.3

Table 6. Decorated Pottery Types by Level.

(Levels 9–17 are listed below Levels 0–8.)

Pottery Type	Count	% of count	0, Surf.	% of 0	Level 1	% of 1	Level 2	% of 2	Level 3	% of 3	level 4	% of 4	Level 5	% of 5	Level 6	% of 6	Level 7	% of 7	Level 8	% of 8
Socorro B/W	76	0.4			4	0.1	6	0.2	1	0.1	5	0.4	4	0.2	7	0.9	2	0.4		
Chupadero B/W	3	0.0			2	0.0	1	0.0												
Santa Fe B/W	3	0.0			1	0.0	2	0.1												
Biscuit A	22	0.1			4	0.1	1	0.0	4	0.3			1	0.1	4	0.5	1	0.2	2	0.3
Biscuit B	20	0.1	2	1.2			7	0.2	5	0.4	1	0.1	1	0.1	2	0.2				
Sankawi B/Cream	2	0.0											1	0.1	1	0.1				
Red/tan	4	0.0					3	0.1												
Acoma-Zuni Glazes (Combined)																				
Kwakina, Pinnawa, Kechipawan	353	1.7	1	0.6	70	1.7	60	1.5	18	1.3	12	1.0	32	1.8	19	2.3	10	1.9	10	1.6
Hopi Area																				
Jeddito G/Y	94	0.5			11	0.3	12	0.3	17	1.3	12	1.0	8	0.4	5	0.6	3	0.6	2	0.3
Sikyatki G/Poly	17	0.1					6	0.2	1	0.1	3	0.2	4	0.2	1	0.1				
Hopi painted, NFS	111	0.5			30	0.7	24	0.6	5	0.4	5	0.4	10	0.6	2	0.2	2	0.4	6	1.0
Other																				
Unidentified	8	0.0					5	0.1									3	0.6		
Total	20555	100.0	169	100.0	4146	100.0	3941	100.0	1349	100.0	1245	100.0	1779	100.0	812	100.0	516	100.0	630	100.0

Table 6. Decorated Pottery Types by Level.

(Levels 0–8 are listed above Levels 9–17.)

Pottery Type	Level 9	% of 9	Level 10	% of 10	Level 11	% of 11	Level 12	% of 12	Level 13	% of 13	Level 14	% of 14	Level 15	% of 15	Level 16	% of 16	Level 17	% of 17
Rio Grande Glaze Ware																		
Los Padillas-Arenal G/Poly			1	0.1	7	0.5							1	0.7				
Agua Fria G/R, red slip variety	188	21.2	413	27.5	315	24.5	291	30.7	263	34.2	64	30.3	36	26.7	50	30.5	18	26.9
Agua Fria G/R, orange slip variety	122	13.7	204	13.6	175	13.6	121	12.8	86	11.2	22	10.4	18	13.3	15	9.1		
Cieneguilla G/Y	42	4.7	40	2.7	53	4.1	39	4.1	12	1.6	4	1.9	6	4.4	4	2.4	4	6.0
Cieneguilla G/Poly									1	0.1							2	3.0
Largo B/Y					1	0.1												
San Clemente G/Poly, all varieties	126	14.2	257	17.1	147	11.4	93	9.8	84	10.9	21	10.0	16	11.9	9	5.5	7	10.4
Pottery Mound G/Poly, all varieties	30	3.4	8	0.5	22	1.7	6	0.6	10	1.3	1	0.5			1	0.6		
Kuaua G/Poly																		
Espinoso G/Poly																		
Glaze D, San Lazaro G/Poly																		
Rio Grande Glaze Ware, Unpainted																		
Plain red	347	39.1	504	33.6	484	37.7	361	38.1	273	35.5	83	39.3	52	38.5	74	45.1	31	46.3
Plain orange	4	0.5																
Red/white or white/red	9	1.0	9	0.6	28	2.2	7	0.7	2	0.3	5	2.4	1	0.7	1	0.6	1	1.5
Unpainted from glaze, NFS	3	0.3			2	0.2												
Black-on-white Types, Biscuit Ware, Red-on-tan																		
Red Mesa, Puerco, Gallup B/W					1	0.1											1	1.5
Socorro B/W	4	0.5	11	0.7	11	0.9	9	0.9	7	0.9			1	0.7	4	2.4		
Chupadero B/W																		

Table 6. Decorated Pottery Types by Level.

(Levels 0–8 are listed above Levels 9–17.)

Pottery Type	Level 9	% of 9	Level 10	% of 10	Level 11	% of 11	Level 12	% of 12	Level 13	% of 13	Level 14	% of 14	Level 15	% of 15	Level 16	% of 16	Level 17	% of 17
Santa Fe B/w																		
Biscuit A			1	0.1	3	0.2	1	0.1										
Biscuit B			1	0.1	1	0.1												
Sankawi B/Cream																		
Red/tan	1	0.1																
Acoma-Zuni Glazes (Combined)																		
Kwakina, Pinnawa, Kechipawan	9	1.0	33	2.2	24	1.9	16	1.7	18	2.3	8	3.8	4	3.0	6	3.7	3	4.5
Hopi Area																		
Jeddito G/Y	1	0.1	8	0.5	4	0.3	2	0.2	9	1.2								
Sikyatki G/Poly					2	0.2												
Hopi painted, NFS	2	0.2	10	0.7	5	0.4	2	0.2	5	0.6	3	1.4						
Other																		
Unidentified																		
Totals of columns:	888	100.0	1500	100.0	1285	100.0	948	100.0	770	100.0	211	100.0	135	100.0	164	100.0	67	100.0

Massive amounts of Agua Fria Glaze-on-red (Glaze A red) are present in every level, even though it declines in frequency through time. It is the dominant glaze type in every level, and was undoubtedly produced (or at least used) throughout the occupation of Pottery Mound.

Agua Fria Glaze-on-red was divided into two varieties, one with a dark red slip and the other with a lighter orange slip. The dark red slip variety is the oldest major ceramic group produced at the site, and its 4,575 sherds constitute the most common major group at all times. It declines through time and is especially prominent in the early levels—Levels 10 through 17—with the highest percentage in Level 13. In these levels the type represents 27 to 34 percent of the painted pottery. The orange slip variety of Agua Fria, identical to the red slip variety in all other respects, represents the second most popular ceramic group throughout time (3,075 sherds). Its percentages rise through time at the expense of the dark red variety. Orange slip Agua Fria Glaze-on-red increases from 9 percent of the decorated pottery in Level 17 to 32.5 percent in Level 1.

Cieneguilla Glaze-on-yellow (Glaze A yellow) was never as popular as Agua Fria Glaze-on-red, though some analysts may have included my "orange slip" of Agua Fria in Cieneguilla Glaze-on-yellow. In this analysis, a sherd had to have a truly yellow slip to be assigned to Cieneguilla. The type is uncommon throughout the stratigraphic sequence. The highest percentage was found in the lowest level, 17, where it amounted to 3 percent of the decorated sherds. Glaze A yellow, never common, declined somewhat through time as yellow slips were incorporated into San Clemente and Pottery Mound Polychrome. The polychrome version of Cieneguilla is clearly late, a few sherds appearing in Levels 1–6 only.

Glaze B, represented by Largo Glaze-on-yellow, is represented by eight sherds. In essence, the Glaze B phase does not exist at Pottery Mound, though the site was clearly occupied at the time. Instead, Glaze B pottery was unpopular and the local potters continued to make Glaze A. The few Glaze B sherds are mostly in Levels 3 through 7, in the middle to upper strata. This is where they might be expected, given the sequence of Glaze A through Glaze C at this site.

San Clemente Glaze Polychrome spans the Glaze A–C periods at this site, and displays more internal variation than any other type. It is shown in Table 6 with all its analytical varieties combined, while Table 5 separates the varieties. Present from the beginning, San Clemente was always popular, being second only to Agua Fria in terms of numbers. San Clemente peaks at 17 percent of the painted pottery in Levels 3 and 10, and is fairly common in the levels in between (Table 6). Its popularity generally increased through time, but may have declined toward the end—the topmost levels (0–2) suggest such a decline, possibly in favor of Pottery Mound Polychrome.

Breaking San Clemente into its varieties, the possible time trends among them may be seen in Table 5. Recall from Table 3 that the analysis divided the type into five categories: chalky white interior, red exterior (115); creamy white interior, red exterior (116); chalky white exterior, red interior (117); creamy white exterior, red interior (118); and white or creamy on both sides of the bowl (119). An examination of the five varieties did not reveal any strong temporal trends among them. Any given variety accounted for 1 to 4 percent of all sherds in a given level.

No San Clemente sherds with white-slipped exteriors were found in Levels 16 and 17. Once present, they were never as common as sherds with an interior white slip, but their percentages increased through time.

In the contrast between chalky and creamy white slips, I have already noted an association between chalky white slips and exterior white slips. Chalky white slips show a peak in Levels 8–10. A slow change toward exterior chalky slips can be discerned for San Clemente.

Despite these two minor trends, the overall percentage of San Clemente stays more or less constant throughout. All five varieties are at least present in almost all levels. If any noteworthy trend is visible, it is the gradual increase in exterior chalky slips with time. The persistent coexistence of two surface varieties (white interior versus white exterior) and two slip varieties (creamy versus chalky) during most of the site's existence is interesting. Why did these various uses of slip type and surface application coexist? Perhaps different family lines promoted one variety over the other, as occurs in modern Pueblo pottery. It is tempting to think of creamy white slip applied on the interior as more "Rio Grande" while a chalky white slip, particularly when applied to bowl exteriors, as more "Acoma-Zuni." Whatever the origins and meaning of the five varieties, it is clear that they coexisted in time. These varieties might relate to different ethnic or cultural groups resident in the community (Eckert 2003).

A specialized form of San Clemente, Kuaua Glaze Polychrome shouldered bowls decorated mainly on the exteriors, is late in the series. Some were classed as San Clemente but those recognized as a separate group are listed in Table 6. All Kuaua distinguished as such is in Levels 1 through 6. It is most common in Level 3. Always a minor type, Kuaua is definitely late and its rims are always Glaze C in shape.

Pottery Mound Polychrome should be absent at first, then increasing through time. Indeed, this is the case. There are only two sherds of this type below Level 13. From that level upward, it amounts to less than 2 percent of the decorated wares until Level 9. From that point on, Pottery Mound Polychrome increases from about 3 percent of the decorated pottery up to 8.3 percent at the surface (Table 6). Although never dominant at any time, Pottery Mound Polychrome shows a definite increase in popularity through time.

Classification of Pottery Mound Glaze Polychrome included a distinction between a chalky slipped variant and a tan-buff-olive variant. The latter is dominant within the type, with 509 sherds. The chalky variant includes only 175 sherds.

Was there any change in slip preference within Pottery Mound Glaze Polychrome? The two varieties are present in every level where the type was discovered. In all but one level, the tan-buff-olive variety (Code 126) outnumbers the chalky white slip variety (Code 127). Thus, we see no particular trend in preference for one slip versus the other through time.

Pottery Mound Glaze Polychrome is the culmination of the potter's art at the site, and it peaks at the end of the stratigraphic sequence. Even so, it never amounted to a large percentage of the sherds in any level. At the surface of the test pit, where it was as frequent as it ever became, it constituted 6 percent of all pottery from the level.

Glaze D (San Lazaro Glaze Polychrome) should be very late in the sequence. As with Kuaua, this type was never a dominant one. All seven sherds are from Level 6 or above, confirming its late placement (Table 6).

Figure 39 shows these trends in Rio Grande Glazeware types graphically, and was derived from Table 6. Los Padillas-Arenal and Kuaua are basically too few in number for graphical treatment, although one is early and the other is late, as noted from Table 6. Clearly shown however, is the decline in Agua Fria, red slip, and the rise of the orange slip variant. Cieneguilla G/y remains at a constant low level throughout time. San Clemente is always popular during the total time span, while Pottery Mound poly displays a definite increase with time.

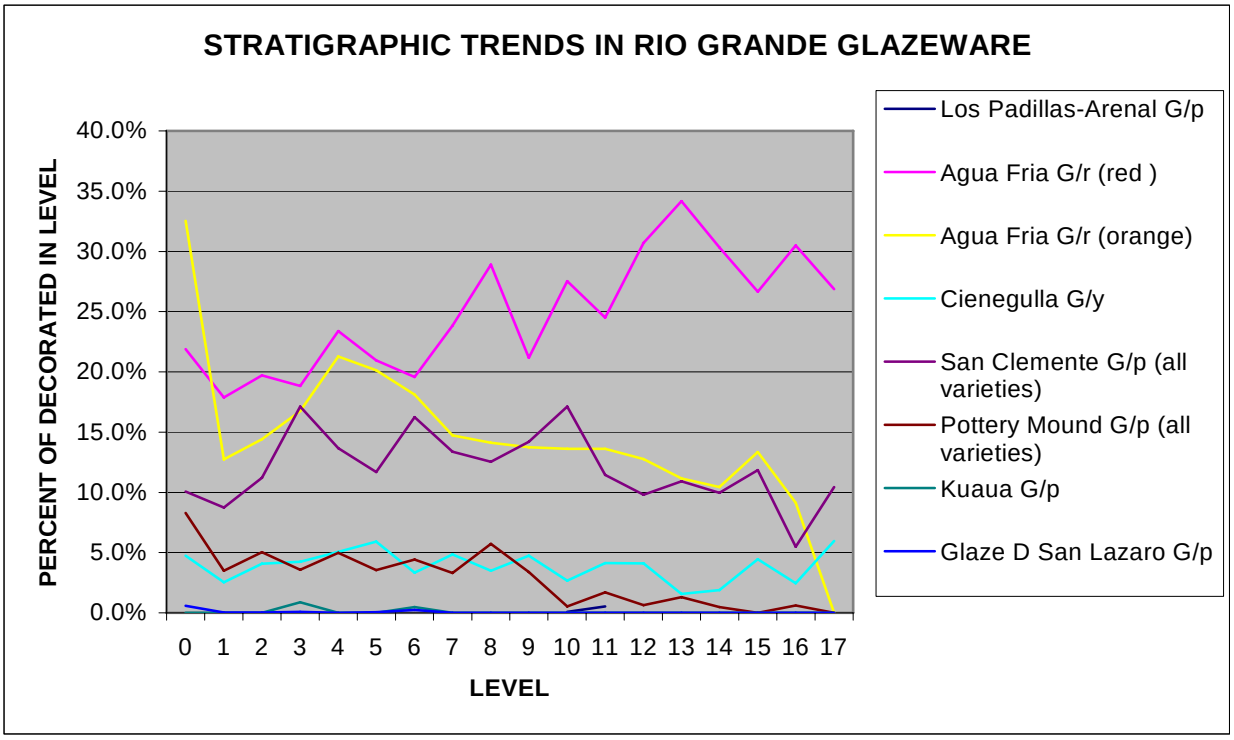

Figure 39. Stratigraphic trends in Rio Grande Glaze Ware.

Intrusive Painted Wares

Turning to non-local (imported) painted types, a small amount of Cibola White Ware appears sporadically in the sequence. As these are out of place and time, they perhaps represent heirloom pieces. The lowest Cibola sherds are actually Red Mesa Black-on-white, which is to be expected. Similarly, Socorro Black-on-white derives from a pre-1300 context somewhere near Pottery Mound. An earlier village in the vicinity, or even beneath the Pottery Mound glazeware component, may be the source of these sherds. As artifacts out of their proper place and time, the Socorro sherds might not be expected to show any clear stratigraphic trend. It is therefore noteworthy that most Socorro Black-on-white sherds (by count or percentage) were found in or

below Level 10. Forty-three sherds are from this lower region; the highest percentage occurs in Level 16, at the bottom of the trench. The expected early distribution is confirmed, while redeposition by later residents probably accounts for the examples in later levels.

The very few pieces of Chupadero Black-on-white and Santa Fe Black-on-white are all in Levels 1 and 2, reflecting their place late in the occupation. While few examples of either type occur at Pottery Mound, the focus of Santa Fe Black-on-white is to the north, and that for Chupadero Black-on-white to the east.

The Biscuit Ware of the Pajarito Plateau-Bandelier National Monument area is present with some regularity (42 sherds). Significantly, there is none in Levels 13 through 17, at the bottom of the pit. Biscuit A makes its first appearance in Level 12 and increases in percentage thereafter. Biscuit B appears consistently in Level 6 and higher and is the only biscuit ware on the surface. The latest type in this carbon-painted series, Sankawi Black-on-cream, is represented by a few sherds in the highest levels (Level 6 and above). Thus, the carbon-painted Biscuit A, Biscuit B, and Sankawi appear in the strata in the order expected from their dated associations farther north.

The 353 painted sherds from the Acoma and Zuni areas make up the largest collection of imported pottery at Pottery Mound. Taken as a group, the Acoma-Zuni imports were not only abundant, but were present in all of the 17 levels. A consistent connection to Acoma and Zuni area pueblos is evident throughout time. The extent of these imports at Pottery Mound has not been recognized heretofore, perhaps due to the attention paid to the more obvious Hopi imports. In contrast, imports from the Acoma-Zuni area superficially resemble the locally made San Clemente Glaze Polychrome. Indeed, without microscopic examination of the paste and temper, the local San Clemente is often not distinguishable from bona fide imported pottery from Acoma or Zuni. This close resemblance is not coincidental, but reflects very strong stylistic influence or even direct copying of the imported ceramics. Eckert (2003) discusses the social implications of this phenomenon.

Despite the well-known importation of ceramics from the Hopi mesas, the 222 sherds of Jeddito Black-on-yellow and Sikyatki Polychrome from the 1979 test are considerably fewer than the total for the Acoma and Zuni areas (Table 6). Moreover, Hopi pottery may not have appeared at Pottery Mound as early as imports from Acoma-Zuni. No Hopi pottery is present in the lowest three levels, and only 3 sherds were recovered from Level 14. Hopi pottery does not appear in quantity until Level 13. Thereafter, Hopi sherds are part of the assemblage in every level, but are less frequent than Acoma-Zuni sherds in all but two of those levels. In only Levels 3 and 4 do Hopi imports exceed those from the Acoma-Zuni area.

In theory, the Hopi types Jeddito and Sikyatki should appear in that order. There is some evidence of this tendency. Jeddito is present in Level 13 and above. Fifteen of the 17 Sikyatki sherds are were recovered in Level 6 up to Level 1. Jeddito and Sikyatki co-exist in these higher and later levels.

Unpainted Pottery

Turning to utility wares, previous studies lead us to expect a stylistic transition from clapboard corrugated to indented corrugated to obliterated-smeared corrugated. Is this trend visible? Clapboard corrugated is not only the most scarce of the three, it tends to occur in the lower levels (Table 5). It is present in the lowest level, reaches a peak of 0.4 percent of all pottery in Level 11, and declines from there upwards. Indented corrugated, represented by 122 specimens, is also early. Present from the beginning, it reaches a peak in Levels 10 through 13 and thereafter declines in relative (if not actual) frequency. Obliterated-smeared corrugated is more frequent still (152 sherds), and was probably still being made during the early occupation of Pottery Mound . Its percentages peak in Levels 10–16, towards the bottom of the deposits. A few sherds of obliterated-smeared corrugated occur later in the deposits.

Plain gray utility dominates the entire sequence, amounting to 35 to 50 percent of all sherds in each level. No clear trend through time emerges. Due to sorting bias, it is possible that some examples of this type, in the lower strata, are actually non-textured portions of corrugated vessels whose sherds are also found at those depths.

The 27 sherds of Los Lunas Smudged might be expected to exhibit an "early" distribution, similar to its companion Socorro Black-on-white, but this is not borne out. The small sample of sherds appears to be scattered in the stratigraphic column, although they are concentrated in Levels 11 and 12. Both Los Lunas and Socorro are presumed to predate the known occupation of Pottery Mound, so pottery from an earlier occupation at or near Pottery Mound was either disturbed or reused by glazeware residents, and redistributed in this trash deposit.

Acoma-Cibola plainware (47 sherds) is scattered through the middle and late levels. Like its painted counterparts, the plainware from the Acoma-Zuni area was evidently present during most of the village's life span. Likewise, the 17 sherds of Hopi plain and corrugated ware show no time trend (they are scattered from Level 16 up to Level 1). The appearance of corrugated utility ware from both Acoma-Zuni and Hopi alongside their painted counterparts is quite interesting.

Time Units within the Stratigraphy

Up to this point, all of my analysis has been based on the 20 cm levels used in 1979. Artificial levels rarely correspond exactly with natural strata, and it was possible that multiple levels would be from a uniform series of deposits. Thus, the data in Tables 5 and 6 were examined for "breaks" in the ceramic series. One such break occurs between Levels 6 and 7. Levels 6 and above contain all the late glazes (e.g., Kuaua and San Lazaro), much of the Pottery Mound Polychrome, all of the examples of Chupadero Black-on-white, and almost all of the Biscuit B pottery. Another such break occurs between Levels 9 and 10. Below that break, Pottery Mound Glaze Polychrome percentages drop from 4–5 percent down to 0.5–1.5 percent. Biscuit B is almost absent below Level 10. A third "break" occurs between Levels 11 and 12. Below Level 11 there is almost no Biscuit ware of any kind, while Pottery Mound Glaze Polychrome is 1.3 percent or less of the painted pottery. In these lower levels, the painted assemblage is dominated

almost entirely by Agua Fria and includes smaller amounts of San Clemente Glaze Polychrome and Cieneguilla Glaze-on-yellow.

Thus, the stratigraphy can be separated into two or possibly three major depositional episodes, based on changes in pottery amounts. Without independent dates, assigning ages to these deposits is problematic. Still, changes in the cross-dated pottery suggest time assignments for the depositional units. The Biscuit Ware series is the most reliably dated of the trade wares. The relevant dates are: Biscuit A, 1375–1450; Biscuit B, 1425–1550; Sankawi Black-on-cream, 1500–1600 (Table 1). Using these time indicators, we can assign the deposits in Level 12 and below to a pre-1375 period, based on the lack of Biscuit wares. After that, Levels 11 through 7 are characterized by frequent Biscuit A, but almost no Biscuit B, or a time between 1375 and about 1450. Levels 6 up to the surface stand out ceramically on several grounds, as mentioned. Using the Biscuit series, Biscuit B and A are both present in the upper layers, and Sankawi appears as small amounts close to the surface. Based on the biscuitware information alone, it can be said that deposition must have started prior to A.D. 1375, probably between 1325 and 1350, and continued until at least 1500.

The small amounts of San Lazaro Glaze Polychrome, Chupadero Black-on-white, and Sikyatki Polychrome are also consistent with an end date of about 1500. All three types ended that late or later, based on their associations elsewhere. Almost all the Glaze D pottery examined at the site contains local paste and temper. I can suggest, tentatively, that the population was dwindling after the end of Glaze C (ca. 1490) and that the site was abandoned about 1500.

Summary of Stratigraphic Trends

The examination made above, of trends within the 1979 test, leads to several conclusions.

1. The basic sequence (through time, as inferred from stratigraphy) of the Rio Grande Glaze Ware rim types follows the pattern proposed by Mera for Glazes A through D. The earliest Rio Grande glazeware types (Los Padillas, Arenal) are rare and probably represent heirloom pieces created prior to Pottery Mound's inception. Small amounts of Socorro Black-on-white also attest to an earlier occupation at Pottery Mound or somewhere in the vicinity. If the former is the case, however, the Socorro era deposits at the site have yet to be discovered.

2. Glaze A red (Agua Fria) and Glaze A yellow (Cieneguilla) are the dominant types at the start of the main sequence, declining through time. San Clemente Glaze Polychrome was present from the start, and persisted through time, declining slightly toward the end. Pottery Mound Polychrome was absent in the lowest strata, appearing in small quantities in the middle of the series. In the later strata Pottery Mound Polychrome, along with Kuaua Glaze Polychrome, increased steadily through time (in absolute numbers, and in percentage of decorated pottery per level). In addition, chalky white slips increased through time (relative to creamy slips) on San Clemente and Kuaua Polychrome.

3. Glaze B types and rim forms are very rare at Pottery Mound, as is the case throughout the southern range of the Rio Grande Glaze Ware region. Pottery Mound was obviously occupied during the A.D. 1425 to 1450 period assigned to Glaze B. The phase is a short one, and local potters never preferred making these types of rims. Instead, for the most part, Glaze A rims partly gave way to Glaze C rims.

4. The upper strata in the 1979 test are characterized by late San Clemente, Kuaua, and Pottery Mound Glaze Polychromes (despite the continued use of Glaze A rims, essentially a Glaze C assemblage). Bichrome (glaze-on-red and glaze-on-yellow) painting persisted, however. Glaze D sherds are few in number; the San Lazaro Glaze Polychrome is strongly clustered in the uppermost levels, as would be expected.

5. Well-dated intrusive pottery also shows similarly clear trends. In particular, the Biscuit A–Biscuit B–Sankawi series shows up in the expected order. Biscuit Wares are present only in the upper two-thirds of the levels, and over time B increases relative to Biscuit A.

6. Hopi and Acoma-Zuni trade sherds are present throughout the occupation span. There are indications that trade wares from Acoma-Zuni were present before Jeddito Black-on-yellow appeared at the site.

7. Plain utility sherds are the majority at all times, but small amounts of corrugated sherds are associated with the plain utility ware in the lowest levels of the test. Production of corrugated pottery was on its way out as Pottery Mound was founded. Small amounts of Los Lunas Smudged accompany the Socorro Black-on-white, both probably carried over from pre-glaze times. Similarly, small amounts of corrugated pottery from both the Acoma-Zuni and the Hopi areas accompany their respective painted counterparts. The pottery trade from these two districts was not confined to painted pottery.

8. Based on ceramic cross-dating, the depositional history of the midden sampled in 1979 can be grouped into three major episodes: pre-1375, 1375–1450, and 1450–1500.

9. Extensive overlap between the major types is evident. For most of its occupation, Pottery Mound's inhabitants made (or at least continued to use) most of the major locally made glazeware types (Agua Fria, Cieneguilla, San Clemente, Pottery Mound). In spite of definite trends in the first appearance or maximum popularity of these types, most major types seem to have been used (if not produced) concurrently. This fact implies considerable diversity in the social, economic, and religious aspects of contemporary Pueblo culture. Production by different groups of potters, or of different forms for different purposes, as well as the extensive importation of pottery, reflected and contributed to the diversity of the Pueblo culture florescence during Pueblo IV.

Together with the other lines of evidence described in this report, the ceramic sequence provides much useful information on the chronology of the site. Confirmation of this sequence via absolute dating would be welcome. The four existing tree-ring dates hint at a building boom between 1380 and 1450. They provide no indication that the site continued to 1500 or later, though there now appears sufficient ceramic evidence for that ending date. Perhaps radiocarbon

dates on maize cobs from the 1979 test could be used to confirm the chronology deduced from the ceramic series.

Rim Form Changes

The next line of evidence to be considered is changes in rim form.

Established Rim Form Sequence

Figures 5 and 6 illustrate the forms typically organized as A, B, and C. First proposed as a numbered series at Pecos (Kidder and Shepard 1936), the nomenclature was broadened in geographic scope and given letter names by Mera (1933, 1940). Mera's system has become the standard. In that system, Rio Grande Glaze Ware rim shapes are time-sensitive and, along with changes in painted design, demarcate five production periods between 1315 and 1700. Here we are concerned with the Glaze A through Glaze C, and to some extent with Glaze D, or 1315 to 1500–1525.

Figures 5 and 6 show how glazeware potters began by making simple straight rims with a rounded lip (e.g., Los Padillas, Arenal, and Agua Fria). Thus, Glaze A is typified by "ordinary" rims inherited from types such as St. Johns Polychrome. During Glaze B times, potters began to experiment with rims, flattening the lips and slightly thickening the rims. Glaze C saw an explosion of experimentation in rim treatments. First, the thickened rim was accentuated with an exterior "tang" or slight outward projection. Later, the thickened rim was slanted inwards, or "beveled," often including an outward tang. In some cases, rims began to assume an S shape, gently outcurving to the lip. With time, quite exaggerated rims appeared, involving incurved rims with outcurving tangs, and drastically beveled and slanted profiles (Figure 5, middle). Kuaua Glaze Polychrome demonstrates this extreme form of the bevel and flattened rim (Figure 5, middle column).

Glaze D went on a different track. Beveling, slanting, and tangs were gone. Rims were thickest farther down (2–3 cm from the lip). The lip returned to a gentle rounded shape. Vessel walls and rims took on a "golf club" profile. Next, some potters began to use an angle of flexure at the bottom of the elongated rim, this angle sometimes known as a "carina." The sharp change marked the base of the bowl from the rim portion, which was now elongated to 3–4 cm. The evolution of rim shapes continued into Glaze E and F, influenced by European vessels in many cases, but the later changes are not relevant to this discussion.

Comparison to Pottery Mound Rim Forms

Inspection of the rim profiles of the major glazeware types at Pottery Mound (Figures 7–13) and comparison to the "standard" rim shapes (Figures 5 and 6) give a general impression of where each of the local glaze types fall within the Glaze A–F series. It can be seen, first of all, that if each type is defined in terms of painted design, it contains a range of rim shapes, not those from

just one of Mera's groups. Eckert (2003) obtained similar results. Experimentation with rim treatment must have occurred during the life of each type.

Many of the rim forms for one type overlap with those for other types. This is to be expected, as the types overlapped to some extent. In other words, each type (defined by painted decoration) had a range of rim forms, shared with earlier and later types. Nevertheless, a progression seems to be discernable (see Figures 7–13). Impressionistically, the Agua Fria rim profiles (Figure 7) fit mostly into the A styles of the standard sequence. Some appear a bit like B and even C shapes, however. San Clemente still shows typical A rims, but more examples seem to fit into the C shapes. San Clemente's offshoot, Kuaua, is strongly associated with C shapes. Pottery Mound Glaze Polychrome ranges from A profiles to classic C and even D rim shapes. Thus, despite considerable internal variation, a trend in rim development seems to be evident. This initial view is subjective, however, rather than based on hard numbers. In the next section, quantitative data from the assemblage are used to confirm these trends.

Stratigraphic Changes in Rim Forms

Unfortunately, the complexity of rim forms in Figures 7–13 is difficult to codify. In this analysis, the bowl rim wall "shape" was coded as straight, outcurved, or incurved. Then, each sherd was given a basic lip code describing the top edge of the bowl. The lip codes were round, flat, or beveled (this last meaning slanted toward the interior). The result was nine sorting units. In addition, two special forms were coded, one for B rims (thickened), and another for D rims (elongated and thickened) (Appendix B). In retrospect, this scheme did not capture all of the variability seen in Glaze C as seen in Figures 11–13. It did serve to capture basic rim information, however. The relationships between the codes and lettered forms are:

1. Straight rim, round lip: Glaze A
2. Straight rim, squared lip: Glaze B
3. Straight rim, beveled lip: Glaze C
4. Outcurved rim, round lip: Glaze A
5. Outcurved rim, square lip: Glaze B
6. Outcurved rim, beveled lip: Glaze C
7. Incurved rim, round lip: Glaze A
8. Incurved rim, flat lip: Glaze B–Glaze C
9. Incurved rim, beveled lip: late Glaze C
10. Straight rim, bulbous lip: Glaze B
11. Elongated rim, thickened: Glaze D

In Table 7, the 2,684 bowl rims are separated into the 11 rim shapes (across) and by levels (down). Referring to the column totals, it is clear that straight rims with rounded lip (classic Glaze A) predominate. Of the rim total, 2,115 (78.8 percent) are straight with rounded lip (Code 1). If Codes 1, 2, and 3 are combined as "straight," more than 91 percent of all bowl rims have a straight profile. Outcurving rims (Codes 4, 5, and 6) are rare, while incurving rims (Codes 7, 8, and 9) are common. Within the straight rims, the vast majority have a rounded lip. This is typical Glaze A pottery.

Table 7. Sherd Form and Bowl Rims by Level.

(Code numbers in parentheses after descriptions)

Level	Bowl Sherds	Body Sherds	Rim Sherds	"A" straight, rounded lip (1)	"B" straight, flat lip (2)	"C" straight, beveled lip (3)	"A" outcurved, rounded lip (4)	"B" outcurved, flat lip (5)	"C" outcurved, beveled lip (6)	"A" incurved, rounded lip (7)	"B–C" incurved, flat lip (8)	"C" incurved, beveled lip (Kuaua) (9)	"B" straight, thickened, rounded lip (10)	"C–D" elongated, thickened (11)	Unidentified
Surf. 0	143	26	117	84	4	18						9		2	
			100%	71.8%	3.4%	15.4%						7.7%		1.7%	
1	2490	2304	186	138	9	25	1			2	1	4	5	1	
			100%	74.2%	4.8%	13.4%	0.5%			1.1%	0.5%	2.2%	2.7%	0.5%	
2	2370	1900	470	307	23	61	11	2		18		46	2		
			100%	65.3%	4.9%	13.0%	2.3%	0.4%		3.8%		9.8%	0.4%		
3	821	603	218	162	5	24	1	3	12			8	2	1	
			100%	74.3%	2.3%	11.0%	0.5%	1.4%	5.5%			3.7%	0.9%	0.5%	
4	797	542	255	196	11	17	5			1		25			
			100%	76.9%	4.3%	6.7%	2.0%			0.4%		9.8%			
5	1078	765	313	236	13	39	1			2		22			
			100%	75.4%	4.2%	12.5%	0.3%			0.6%		7.0%			
6	522	356	166	127		21	2					8	2	6	
			100%	76.5%		12.7%	1.2%					4.8%	1.2%	3.6%	
7	292	185	107	87	3	6				3		7	1		
			100%	81.3%	2.8%	5.6%				2.8%		6.5%	0.9%		
8	364	242	122	111	1	2	3					5			
			100%	91.0%	0.8%	1.6%	2.5%					4.1%			
9	551	447	104	92	2	6	2			1		1			
			100%	88.5%	1.9%	5.8%	1.9%			1.0%		1.0%			
10	868	691	177	151	1	20						3			2
			100%	85.3%	0.6%	11.3%						1.7%			1.1%
11	850	693	157	149	3	3	1						1		
			100%	94.9%	1.9%	1.9%	0.6%						0.6%		

Table 7. Sherd Form and Bowl Rims by Level.

(Code numbers in parentheses after descriptions)

Level	Bowl Sherds	Body Sherds	Rim Sherds	"A" straight, rounded lip (1)	"B" straight, flat lip (2)	"C" straight, beveled lip (3)	"A" outcurved, rounded lip (4)	"B" outcurved, flat lip (5)	"C" outcurved, beveled lip (6)	"A" incurved, rounded lip (7)	"B–C" incurved, flat lip (8)	"C" incurved, beveled lip (Kuaua) (9)	"B" straight, thickened, rounded lip (10)	"C–D" elongated, thickened (11)	Unidentified
12	622	506	116	109	2	5									
			100%	94.0%	1.7%	4.3%									
13	450	342	108	106	1	1									
			100%	98.1%	0.9%	0.9%									
14	137	112	25	22		3									
			100%	88.0%		12.0%									
15	79	54	25	25											
			100%	100%											
16	106	97	9	5	3	1									
			100%	55.6%	33.3%	11.1%									
17	49	40	9	8	1										
			100%	88.9%	11.1%										
Sum:	12,589	9,905	2,684	2115	82	252	27	5	12	27	1	138	13	10	2
Percent of Rims:			100%	78.8%	3.1%	9.4%	1.0%	0.2%	0.4%	1.0%	0.0%	5.1%	0.5%	0.4%	0.1%

A few (82) sherds have the flattened lip typical of Glaze B, and 252 have Glaze C straight rims. Very few rims are outcurved at Pottery Mound (only about 1 percent). Incurved rims are common, especially late in time, and amount to 6.1 percent of all bowl rims.

From the column totals of Table 7, we see that Glaze A rims (Codes 1, 4, and 7) are clearly the most prevalent, occurring on 80.8 percent of bowl rims. Glaze B flattened lips (Codes 2 and 5) are on only 3.8 percent, while Glaze C and D rims occur on 15.3 percent. Thus, A rims dominate, followed by C and D rims, while only a few B rims are present.

Looking at the stratigraphic distribution of these rim forms, the straight rim with round lip is clearly dominant in every stratum. This basic A rim never falls below 70 percent in any level. The percentages do decline through time, from nearly 100 percent in the lower levels to 71 percent on the surface, but is the most common form in all levels.

The few Glaze B rims peak in Levels 2–6, but were never popular at the site. They are almost absent in the lowest levels, consistent with their presumed appearance after Glaze A times.

Glaze C lips on straight rims (Code 3) show a very clear increase through time, corresponding to decreasing percentages of A rims. They reach a high of 15.4 percent at the surface of the unit. In contrast, straight-sided C rims are almost absent below Level 12. There is thus a clear growth in popularity of Glaze C rims over time, but with a goodly amount of A rims continuing alongside the newer ones.

The other major category is the incurved rim with strongly beveled lip (Code 9). This is also a Glaze C trait and is a trademark of Kuaua Glaze Polychrome (a variant of late San Clemente). As such, the rim form should be late Glaze C in time. Of the 138 rim sherds of this extreme C shape, none are seen below Level 10. They exhibit a steady increase after that, peaking in Level 2. Thus, this variant Glaze C rim is clearly late at Pottery Mound, and does not appear until after straight-rimmed C rims appear. Thus, the stratigraphic trends confirm the impression that the "Kuaua" rim is a late variant of the general Glaze C rim.

Only 10 elongated and thickened rims were found. These are in the shape range for the Glaze C–Glaze D transition (Figures 12 and 13) so probably come from the end of the occupation. The 10 sherds are all in Level 6 or higher—they do not all come from the topmost layers. Their position confirms to some extent their late position in the chronology.

In summary, Glaze A straight rims are predominant in all levels. Glaze B rims are quite rare. Glaze C straight rims increase through time, to the top of the midden. The specialized "Kuaua" rims, a C variant, show a similar increase through time. The general order of appearance is A, B, straight-sided C, and angled-beveled C (Kuaua), and elongated C–D.

The order of major appearance conforms to the general pattern of Glaze A through C that might be expected from the traditional glazeware sequence for the region. The persistence of a rim form once adopted (e.g., A and C straight rims) alongside later developments is not really surprising. Overlap in manufacturing spans always produces this effect. The persistence of Glaze A rims alongside later types may simply indicates cultural inertia, as well as the heirloom effect

of pottery continuing in use over several generations. The general lack of Glaze B flattened rims apparently means only this short interlude of ceramic production was not strongly felt at the site, and that the main trend was from straight-round to straight-beveled or straight-slanted, and on into S-shaped C period rims.

Glazeware Type by Rim Shape

Table 8 examines rim shapes in terms of pottery types rather than by stratigraphic level, refining the patterns seen in Table 7. As an hypothesis, some types, such as Pottery Mound Glaze Polychrome and late San Clemente (Kuaua) Polychrome will have more Glaze C type rims (Codes 3, 6, and 9) than presumed earlier types. This hypothesis rests on the fact that incurving and beveled rims are typically Glaze C in date, and thus late in the sequence.

The results of the "type by rim" matrix are in part a self-fulfilling prophecy, as rim form is one (but only one) of the defining features of the glaze types. Still, it is useful to plot the two dimensions of variability, as rim forms do not always follow design style attributes neatly.

Taking the pottery types in probable chronological order, the early glaze types of Los Padillas and Arenal have only Glaze A rims (straight, round lip), as expected. Agua Fria Glaze-on-red has every possible rim form—perhaps not surprising, given the consistent dominance of this painted type. Despite the presence of B and C rims in the type, the reclassification of these later rims into other type names was avoided. Thus, in the current approach, Agua Fria Glaze-on-red may actually yield B or even C type rims, if all other aspects of the vessel remain constant. As a Glaze A type, Agua Fria would be expected to have mostly typical round lips (Codes 1, 4, and 7). Indeed this is the case. About 90 percent of the rims are straight with a rounded lip. Only 16 rims are flat on the lip (and thus traditionally Glaze B or "Largo" Glaze-on-red). Perhaps these are vessels Glaze B in time, but if so, the period for making B rims was very "thin" at this locality. There are also a few C type rims in Agua Fria. Some 47 (5.5 percent) of the rims for the type are type straight rims with interior bevel (Code 3). These were termed "Sanchez" Glaze-on-red by the Eighth Ceramic Seminar (1966). A very few sherds even display the incurved and beveled Kuaua rim (Code 9). This shows that "Glaze A red" may have persisted as a type into Glaze C times, confirming the stratigraphic evidence in Table 6.

There is almost no difference in rim preference between the red-slipped and orange-slipped variants of Agua Fria: their percentages are almost identical on Table 8. Although the orange-slip variant ought to appear a bit after the red-slip variant, this cannot be shown from the data in Table 8. The two Agua Fria varieties together confirm the stratigraphic evidence from Table 6, that the type remained popular through the entire time span of the site.

Cieneguilla Glaze-on-yellow is thought to be mainly Glaze A, with little carryover into Glaze C times, unless as its polychrome variant Cieneguilla Glaze Polychrome. Table 8 does show that the rims are predominantly A in style, although 9.8 percent are Code 3 (beveled C) and 1.7 percent even are later (Kuaua style). As with Agua Fria, the vast majority have a straight profile with rounded lips, but the existence of B and even C rim types is notable.

Table 8: Rims by Glazeware Type.

(Rim codes are in parentheses after descriptions.)

Pottery Type	Type	Total Count	"A" straight, rounded lip (1)	"B" straight, flat lip (2)	"C" straight, beveled lip (3)	"A" outcurved, rounded lip (4)	"B" outcurved, flat lip (5)	"c" outcurved, beveled lip (6)	"A" incurved, rounded lip (7)	"B–C" incurved, flat lip (8)	"C" incurved, beveled lip (Kuaua) (9)	"B" straight, thickened, rounded lip (10)	"C–D" elongated, thickened (11)	Unidentified
Glaze A unidentified	100	2	1		1									
		100.0%	50.0%		50.0%									
Los Padillas G/p	101	1	1											
		100.0%	100.0%											
Arenal G/p	105	5	5											
		100.0%	100.0%											
Agua Fria G/r red slip	110	862	774	15	47	3	1		2		15	2	1	2
		100.0%	89.8%	1.7%	5.5%	0.3%	0.1%		0.2%		1.7%	0.2%	0.1%	0.2%
Agua Fria G/r orange slip	111	724	623	22	51	5	4		11		7	1		
		100.0%	86.0%	3.0%	7.0%	0.7%	0.6%		1.5%		1.0%	0.1%		
San Clemente G/p (red ext., chalky white int.)	115	100	72	5	7				2		14			
		100.0%	72.0%	5.0%	7.0%				2.0%		14.0%			
San Clemente G/p (red ext., creamy white int.)	116	253	210	6	25	2			3		6	1		
		100.0%	83.0%	2.4%	9.9%	0.8%			1.2%		2.4%	0.4%		
San Clemente G/p (chalky white ext., red int.)	117	143	31	5	40	2		1			64			
		100.0%	21.7%	3.5%	28.0%	1.4%		0.7%			44.8%			

Table 8: Rims by Glazeware Type.

(Rim codes are in parentheses after descriptions.)

Pottery Type	Type	Total Count	"A" straight, rounded lip (1)	"B" straight, flat lip (2)	"C" straight, beveled lip (3)	"A" outcurved, rounded lip (4)	"B" outcurved, flat lip (5)	"c" outcurved, beveled lip (6)	"A" incurved, rounded lip (7)	"B–C" incurved, flat lip (8)	"C" incurved, beveled lip (Kuaua) (9)	"B" straight, thickened, rounded lip (10)	"C–D" elongated, thickened (11)	Unidentified
San Clemente G/p (creamy white ext., red int.)	118	13	5		7						1			
		100.0%	38.5%		53.8%						7.7%			
San Clemente G/p (white slip both sides)	119	26	12	1	6						5	1	1	
		100.0%	46.2%	3.8%	23.1%						19.2%	3.8%	3.8%	
Cieneguilla G/y	120	235	187	14	23	2			2	1	4	2		
		100.0%	79.6%	6.0%	9.8%	0.9%			0.9%	0.4%	1.7%	0.9%		
Cieneguilla G/p	121	2		1	1									
		100.0%		50.0%	50.0%									
Pottery Mound G/p (generic)	125	1	1											
		100.0%	100.0%											
Pottery Mound G/p (tan, buff, olive slip)	126	49	22	2	10	1			2		11		1	
		100.0%	44.9%	4.1%	20.4%	2.0%			4.1%		22.4%		2.0%	
Pottery Mound G/p (chalky white slip)	127	28	13	3	3				1		6		2	
		100.0%	46.4%	10.7%	10.7%				3.6%		21.4%		7.1%	
Total		2444	1957	74	221	15	5	1	23	1	133	7	5	2
Percent		100.0%	80.1%	3.0%	9.0%	0.6%	0.2%	0.0%	0.9%	0.0%	5.4%	0.3%	0.2%	0.1%

These numbers confirm Cieneguilla as basically Glaze A, with occasional B rims (i.e., "Largo Glaze-on-yellow") and a few straight but beveled C rims. In summary, the rim data for the red-slipped and yellow-slipped "Glaze A" types are similar, in that both include post-A rim forms.

San Clemente Polychrome and its variants are an interesting group. A type that spanned the entire occupation of Pottery Mound, it was made in several variations, which involved the placement of white versus red slip, as well as a contrast between creamy and chalky slips (as was discussed earlier). Due to its variation, San Clemente might be expected to exhibit a wide range of rim forms. Table 8 shows this to be true. As a group, San Clemente includes examples of every defined rim shape: Glaze A, B, C and Kuaua. Most of the rims are straight and round-lipped (classic A) but Glaze C shapes (Codes 3 and 9) are more common than in Agua Fria. By variety, up to 53 percent of San Clemente rims are Glaze C, while up to 44.8 percent are the late Glaze C incurve with bevel (Kuaua style). In all, there are many more C type rims compared to what is seen in Agua Fria and Cieneguilla, even though those two types and San Clemente overlap extensively in time.

Examining the internal varieties of San Clemente, it is evident that rim shape correlates to some degree with red/white slip placement, and also with the contrast between chalky and creamy slip. San Clemente with a white interior and red exterior (Codes 115 and 116) are more "traditional" and probably older varieties. Here, 70 to 80 percent of rims have straight sides and round lips (Rim Code 1). A few B rims and more (7–9 percent) C rims show up in this group. On the other hand, looking at the varieties with red interior and white exterior, or with white on both sides (Type Codes 117, 118, and 119), a noticeable difference emerges. Fewer than 50 percent of these three varieties have classic Glaze A straight rims; the difference is made up by Glaze C shapes (Rim Codes 3 and 9). Glaze C straight-sided, beveled rims now range from 23.1 to 28 to 54 percent (Table 8). Moreover, the late C incurved rim with strong bevel becomes much more prevalent. These Kuaua rims (Rim Code 9) jump to as much as 44.8 percent. Thus, an association of Glaze C rims with chalky white exterior/red interior slip, as well as with white slips on both sides, is indicated.

Looking at the same San Clemente data by type of slip, the chalky white slip variant is especially likely to have Glaze C rims. For type Code 117, Glaze C rims (Rim Codes 3 and 9) constitute more than 70 percent of the category. These data suggest an increase in C type rims with chalky white exterior slip, interior slip. This, in turn, implies that this style of San Clemente Glaze Polychrome is slightly later in time than the San Clemente having a creamy white interior and a red exterior.

In summary, San Clemente varieties display certain temporal trends. The variety with creamy white interior and red exterior slip (Type Code 116) is probably the earliest, and is always the most popular variety. Glaze A rims predominated. But Glaze C straight rims and especially late Glaze C rims with beveling (Kuaua style) increased dramatically in the varieties coded as 117, 118, and 119. These involve either red interior/white exterior or white on both surfaces. The Glaze C trend is especially notable with the variety having a chalky white slip exterior and a red slip interior. This variety, combined with an incurving rim profile and bevel at the lip, forms the classic Kuaua Glaze Polychrome. In addition, the 16 sherds coded separately as Kuaua (not in Table 7) all have the extreme beveled lip on an incurving rim wall by definition. Temporally, a

trend toward white exterior slip, red interior slip, and chalky white slip material is evident. These are strongly correlated with a preference for incurving rims, sometimes "shoulders" on bowls, and a sharply beveled lip.

This combination of attributes marks classic Kuaua Polychrome. It is best seen as a late Glaze C version of San Clemente, based on the trends noted above. In its classic expression, Kuaua has incurving and beveled rims, red interior slip without paint, white exterior slip with paint, and a chalky white slip. This combination is found in Category 117, and those sherds were classed as "pure" Kuaua Polychrome. However, some other San Clemente varieties (and even a few Agua Fria ones) also display the Kuaua rim (Rim Code 9). In other words, the associations of slip, painted design, and rims are not clean-cut. In the analysis, the 16 sherds classed directly as Kuaua (Type Code 302) displayed all the classic traits but, based on data in Table 8, another 90 sherds might be classed as Kuaua based on their incurving and beveled rims. If so, 151 Kuaua Glaze Polychrome sherds are present in the assemblage.

Of course, as with any gradual change, ceramic attributes should not be expected to change evenly or in concert. Far from being clear-cut, the change in potters' preferences can be viewed as a mix of personal or social group choices of slip type, placement of slip by surface, and rim form through time. The current data support that notion, and indicate that Kuaua is a late Glaze C variant of San Clemente. The estimated date for Kuaua, by the Eighth Ceramic Seminar (1966:18), as late Glaze C, seems to fit the Pottery Mound data perfectly. A likely date for Kuaua (without tree ring confirmation) is 1475–1500+.

Pottery Mound Glaze Polychrome, like San Clemente, also reveals a range of rim forms. Although the last type to develop at the site, Pottery Mound Glaze Polychrome is dominated by Glaze A rims (Table 8). Its two varieties vary in slip color; Code 126 has a tan, buff, or olive slip, while Code 127 has a chalky white slip (the kind utilized on some San Clemente varieties [Codes 115 and 117]). Collectively, Pottery Mound Glaze Polychrome has about 45–46 percent Glaze A straight rims. Only five sherds were found to have Glaze B rims. Glaze C rims are common: Code 3 (straight, beveled) rims are 10–20 percent of the Pottery Mound Glaze Polychrome rims, while Code 9 (late Glaze C rims) are another 21–22 percent. Thus, the percentages of C rims are comparable to those for San Clemente. If Rim Codes 3 and 9 are combined as "Glaze C," about 30 to 40 percent of Pottery Mound Glaze Polychrome rims fall into that category.

Within the combined "Glaze C" group, there seems to be little difference between the chalky white slip and the buff-tan-olive slip, in terms of rim form; no clear trend is apparent. These results confirm the impression that Pottery Mound Glaze Polychrome is both a Glaze A type and a Glaze C type. With up to 40 percent of the rims being Glaze C rims, this conclusion seems unavoidable.

Table 9 condenses the Table 8 data. The rim columns are collapsed into Mera's basic groups: A, B, and C. The San Clemente varieties are also combined. Although some detail is lost this way, Table 9 and its associated graph (Figure 40) provide the "big picture." The increase in C rims is dramatic, ranging from 7.6 percent of Agua Fria (by painted design) to 11.6 percent of Cieneguilla, to 33.1 percent of San Clemente, to 40 percent of Pottery Mound Glaze Polychrome.

Table 9. Summary of Pottery Types by Rim Shape.

(From Table 8)

Rim Type	Agua Fria Glaze-on-red Count	%	Cieneguilla Glaze-on-yellow Count	%	San Clemente Glaze Polychrome Count	%	Pottery Mound Glaze Polychrome Count	%
C	120	7.6	27	11.6	176	33.1	30	40
B	42	2.7	15	6.4	17	3.2	5	6.7
A	1,418	89.8	191	82	339	63.7	40	53.3
Total	1,580	100.0	233	100.0	532	100.0	75	100.0

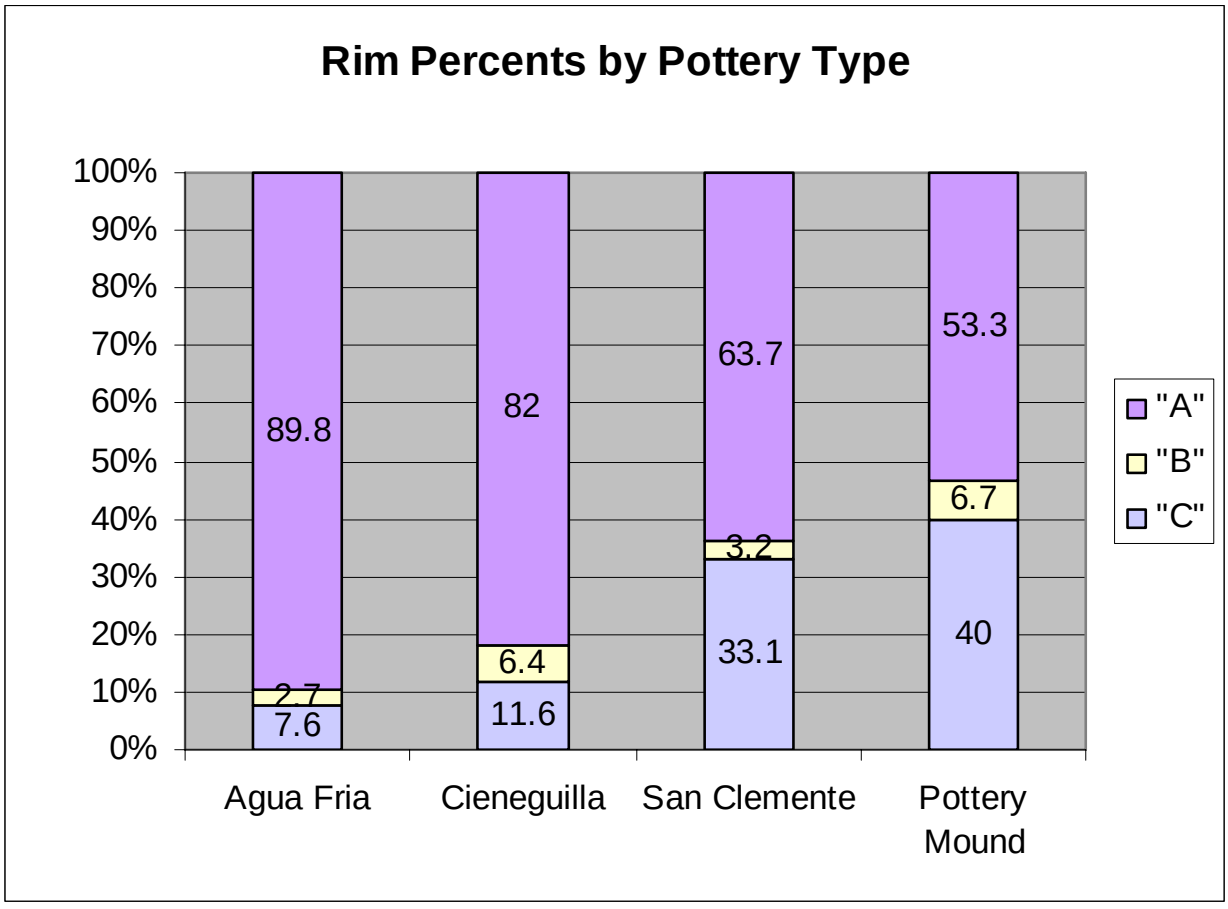

Figure 40. Rim percentages by pottery type, when the latter is based on painting style.

The percentage of B rims hovers at 3 to 6 percent in all four major types. The percentage of A rims declines steadily as C rims become relatively more common. The graph clearly shows that these four types are placed in their approximate time order, from left to right, the percentage of C rims accurately indicates the passage of time.

Seriation of Glazeware

The basic types and their approximate dating is known, as is shown above and in Tables 1 and 2. A finer sequence of types and their constituent varieties can be gleaned from a seriation of styles, in which the continuity of stylistic evolution can be viewed. Thus, an attempt was made to arrange the glazeware types and local varieties into a logical sequence, based on physical attributes alone. Used in this sense, "seriation" is an attempt to view the evolution of traits and place varieties into a logical sequence. This sequence may have chronological meaning, though other evidence is typically required for confirmation.

Figure 41 shows how the types and varieties of glazeware may have developed at Pottery Mound, given their physical attributes. In particular, changes in slip, painting styles, rim forms, and bichrome vs. polychrome arrangements are used in the conceptual progression. Other attributes, such as paste and temper remained static through the lifespan of the local glazewares. Obviously, time-sensitive traits would be the most desirable to used for seriation.

Referring to Figure 41, it may be seen that glaze ware development shows a basic continuity, with stylistic influences from elsewhere. The beginning of glazeware production is not apparent at this site, due to the lack of the White Mountain Red Ware precursors and the very small amounts of Los Padillas and Arenal (the earliest types in the glazeware tradition). This incipient, pre-Pottery Mound phase of glazeware production dates from perhaps 1300 to 1325 or slightly later.

Glazeware production hit full stride between 1325 and 1350, and Pottery Mound was founded no later than the end of that 25-year period. Agua Fria Glaze-on-red and Cieneguilla Glaze-on-yellow are both present, and yellow ware production started slightly later than redware production, which had grown out of White Mountain Redware. A slip change was all that was involved, however. Next, San Clemente was produced by applying red slip on one side and yellow or white slip on the other. This happened, in other words, as a fusion of the redware and yellow ware traditions. At the same time, Agua Fria and Cieneguilla continued to be made alongside the newer San Clemente.

San Clemente was also influenced by (or influenced) the Acoma-Zuni glaze wares of the period. The use of contrasting slips on opposite sides, along with the painted designs, bear a resemblance to Acoma-Zuni practices at this time. Indeed, the first local use of chalky white slip occurs on San Clemente vessels. As will be seen, the raw clay for this slip is not locally derived and may have been obtained from the Acomas (or at least from that geographical area). In some ways, San Clemente and the Acoma-Zuni types are "analogous types," that is, ones that use the same style in different areas.

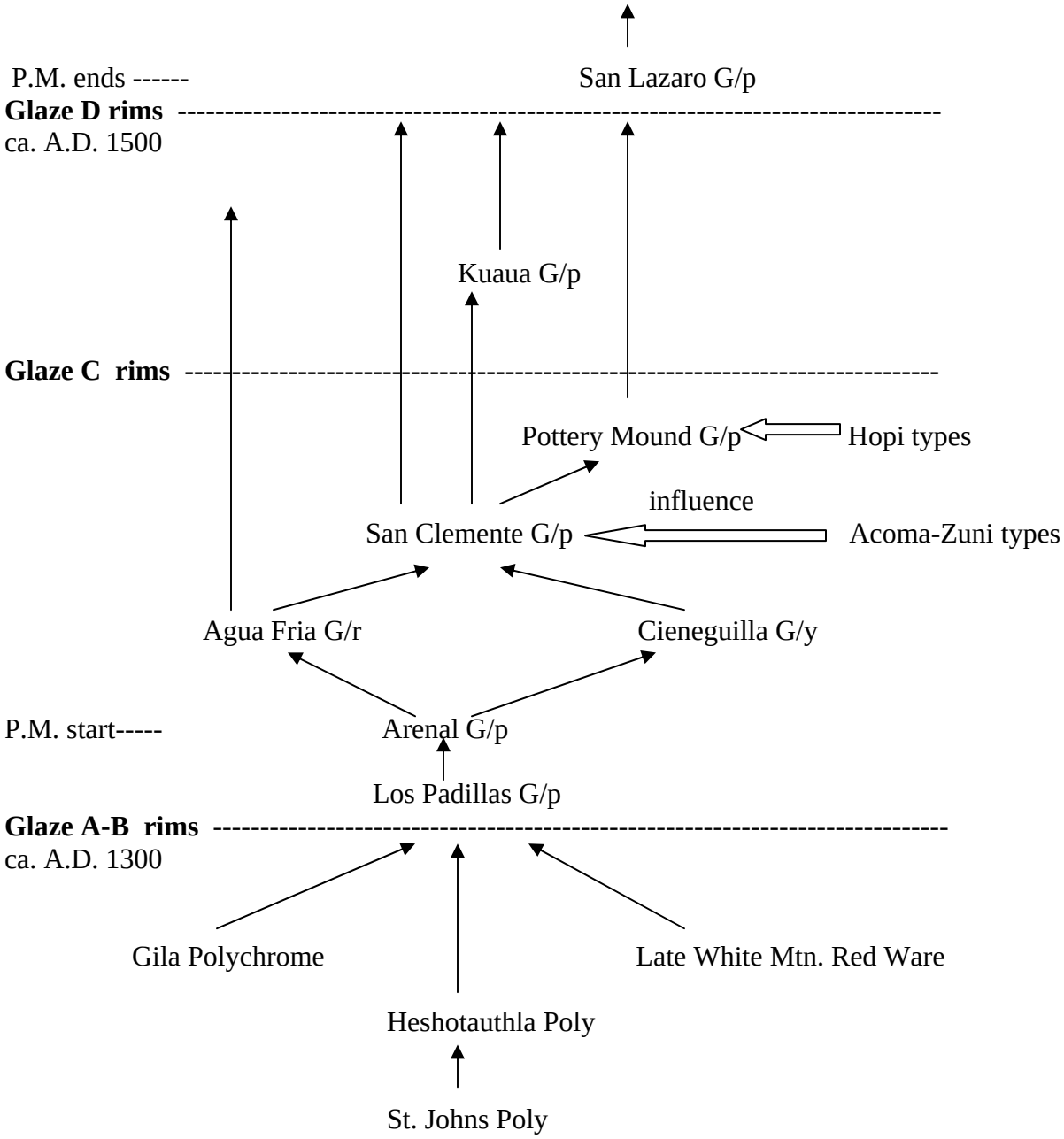

Figure 41. Stylistic evolution of Rio Grande Glaze Ware. The perspective from Pottery Mound, based on seriation of design style and rim attributes.

Concurrently, Agua Fria developed into an orange slip variety, which used an orange slip on bowl interiors instead of the more traditional dark red slip (which continued to be applied to the exteriors). At the time, red-slipped and orange-slipped Agua Fria were in production alongside yellow-slipped Cieneguilla and white-and-red-slipped San Clemente.

With time, a specific variant of San Clemente led to Kuaua Glaze Polychrome, which retained the beveled rim often found on San Clemente, as well as the use of contrasting slips. By incurving the bowl wall, the shouldered bowl was created. On such bowls, painted decoration was found mainly on the exterior surface.

Pottery Mound Glaze Polychrome can be thought of as Agua Fria, San Clemente and Cieneguilla rolled into one. The separate origins are still evident in the duality between a tan, orange or red slip (from Agua Fria) and a chalky white slip (from San Clemente). Most Pottery Mound vessels used one or the other of these slips, but some pots used both. At times, an interior tan-orange slip was combined with a chalky white exterior slip. Indeed, it is the multiple combinations of coloration that make Pottery Mound Glaze Polychrome so expressive.

External stylistic influences had already been seen in Rio Grande Glaze Ware, from White Mountain Red Ware and then from the Acoma-Zuni wares. Now, such influences came from the Hopi types, Jeddito Black-on-yellow and Sikyatki Polychrome. Pottery Mound Polychrome is nonetheless indigenous, made of the same materials and slipped and painted in much the same way as its predecessors. The newly imported ideas extended only to painted designs, and certainly a minority of those. In particular, the use of bird features and parallel lines seems to bear a resemblance to that in Hopi yellow ware. As a confluence of multiple types, both local and foreign, Pottery Mound Glaze Polychrome reached an artistic pinnacle unequalled in the glazeware world. The progression halted with the site's principal abandonment. Some types, such as Pottery Mound Glaze Polychrome, ceased production entirely and were not made elsewhere.

A few Glaze D rims in the sample, as well as others across the site, attest to a relict population, whose pottery did not derive stylistically directly from Pottery Mound Glaze Polychrome but from a Glaze D (San Lazaro) format used on a wider geographic scale. However, almost all the Glaze D pottery examined from Pottery Mound contains the same local paste and temper as in earlier types. These basaltic tempers suggest that San Lazaro Glaze Polychrome was made by resident potters.

Two salient facts appear from the sequence in Figure 41, even though exact dates cannot be applied to all of the changes shown. As was mentioned, one is the coexistence of several types for much of this occupation. This contemporaneous production and use is seen in the dates given to types (Table 1), and by their occurrence in the same levels. The existence of several types made in the same pueblo at the same time is an interesting phenomenon, and one that has counterparts in some modern Pueblos. At the vary least, certain types are not purely sequential; they overlapped in time. The pattern in which one "type" follows another in time is sometimes true, but it does not apply here. The 1979 collections indicate that as many as four stylistic variants were contemporaneous for most of the site's life span.

The second salient fact is that the contemporary types (defined on the basis of design styles) passed through the transition from A to C rim forms together (as indicated by the dashed "horizon" line in Figure 41). While the B rim form was bypassed almost entirely, the four local glazeware types mostly include a good number of typical C rims. Such rims are seen in minor amounts on Agua Fria vessels, and on local yellow wares. They form a higher percentage of San

Clemente, and a still higher percentage of Pottery Mound Glaze Polychrome. That trend is to be expected, given the developments illustrated in Figure 41. This diagram does not sufficiently emphasize the persistence of types, however; earlier ones overlapped with their successors in great measure. This explains why Glaze C rims are found in four types, but in differing proportions. The last Agua Fria produced at the site made use of the Glaze C rims that were, by then, more common in types that evolved out from Agua Fria, like Pottery Mound Glaze Polychrome.

Summary of Chronological Evidence

Several lines of evidence were used to provide as accurate a ceramic chronology for Pottery Mound as possible. Existing chronological information was derived from pottery dated elsewhere in the region, and from the four tree-ring dates ranging from 1381 to 1427. The data arising from this project included accurate type and variety frequencies, stratigraphic distributions of pottery types and varieties, changes in rim forms, and attribute seriation. Fortunately, several of these lines of evidence point to the same conclusion. In other words, the regional sequence for Rio Grande Glazeware, formulated by Kidder and Shepard and extended by Mera, does in fact apply to Pottery Mound. Indeed, the default expectation is that the glazeware types, better-dated elsewhere, would follow the same trajectory at Pottery Mound. Assigning exact dates to types A through D at the site cannot be done at present, however, revised time spans for these types may at least be suggested. Table 10 shows my suggested revisions in the pottery type spans at Pottery Mound; this is shown graphically in Figure 42. The main points may now be reviewed from the earlier discussion.

Start of Occupation

Occupation prior to A.D. 1325 is unlikely, due to lack of the precursors to Agua Fria Glaze-on-red. The White Mountain Red Ware progenitor types of St. Johns and Heshotauthla Polychrome are completely absent. The earliest Rio Grande Glaze Ware types, Los Padillas and Arenal Glaze Polychrome, are present but very rare. The missing types indicate that Pottery Mound was not occupied during the initial phases of Rio Grande glazeware production. This incipient glazeware period occurred between about 1280 and 1325.

In other words, glazeware pottery was not born at Pottery Mound, it was brought there fully developed. There are villages in the southern Rio Grande, such as Valencia Pueblo (Franklin 1997), and Tijeras Pueblo (Cordell 1980a) that are earlier in the glazeware sequence. The Pottery Mound population may have derived from those Rio Grande villages.

The first tree-ring date from the site is 1381, but the earliest pottery made at Pottery Mound has been dated as early as 1325 (Tables 1 and 2). Most authorities place the start of Agua Fria Glaze-on-red at 1325. This seems like a good date for the start of Pottery Mound .

Table 10. Revised Chronology for Rio Grande Glaze Ware at Pottery Mound.

(Prior dates based in Breternitz 1966, Eighth Southwest Seminar 1966, and Oppelt 2002. Suggested dates based on this study.)

Type	1966 Dates	2002 Dates	Suggested Dates
Glaze A			
Los Padillas Glaze Polychrome	1325–1350?	1175–1300	Very minor
Arenal Glaze Polychrome	1325–1375?	1315–1350?	Very minor
Agua Fria Glaze-on-red	1350–1425	1315–1425	1325–1475 or later
San Clemente Glaze Polychrome	1350–1425	1315–1425	1325–1475 or later
Cieneguilla Glaze-on-yellow	1350–1425	1325–1425	1325–1450
Cieneguilla Glaze Polychrome	1375?–1425	1325–1425	1325–1450 or later
Pottery Mound Glaze Polychrome	1350–1450?	1400–1490	1425–1500 or later; actually Glaze A–C
Glaze B			
Largo Glaze-on-yellow	1400–1450	1400–1450	Very minor intrusive
Largo Glaze-on-red	1400–1450	1400–1450	Very minor intrusive
Largo Glaze Polychrome	1400–1450	1400–1450	Very minor intrusive
Glaze C			
Espinosa Glaze Polychrome	1450–1490	1425–1500	Minor intrusive
Kuaua Glaze Polychrome	1450–1525?	1425–1550?	1450–1500 or later
Glaze D			
San Lazaro Glaze Polychrome	1490–1515	1470–1515	Minor type; 1490–1525
Glaze E			
Puaray Glaze Polychrome	1525–1650		not found
Glaze F			
Kotyiti Glaze-on-red	1650–1700		not found
Kotyiti Glaze-on-yellow	1650–1700		not found
Kotyiti Glaze Polychrome	1650–1700		not found
Trenaquel Glaze Polychrome	1650–1700?		not found

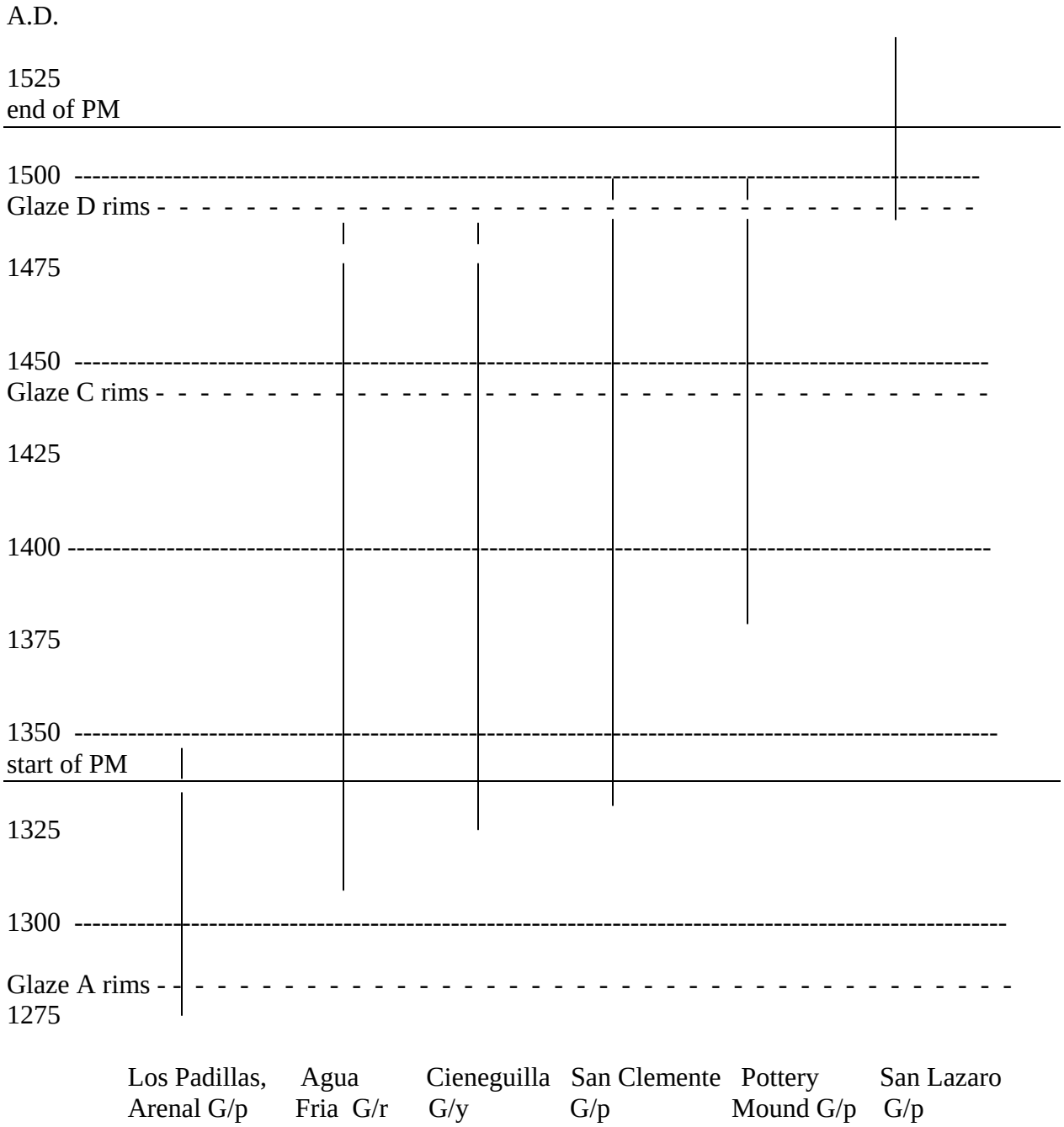

Figure 42. Time spans for local glazeware types at Pottery Mound. Estimates based on dendrochronology, stratigraphy and seriation.

Pre-glazeware Pottery

A small but noteworthy amount of pre-1300 pottery occurs at Pottery Mound, in deposits laid down after 1325. Socorro Black-on-white, Los Lunas Smudged, and indented corrugated pottery indicates a Pueblo III presence. There are at least two explanations for the early pottery. One is that the ceramics are "drift" from some other site in the vicinity, Pueblo III sites occur along the Rio Grande south of Albuquerque, and along or near the lower Rio Puerco (Eidenbach 1982), for example, the Huning Site. Another possibility is that Pottery Mound is underlain by a Pueblo III village. Although there is currently no direct evidence for this (Dave Phillips, personal communication), the excavations have not delved deeply enough beneath the Pueblo IV floors to determine this for certain.

Glaze A Occupation

The site is securely dated to A.D. 1381–1427 by four tree-ring dates. The large amounts of Agua Fria and Cieneguilla certainly indicate an occupation at that time. Clearly, a large occupation occurred during Glaze A times. Nonetheless, small samples of construction dates do not illuminate the full range of the occupation, which may continue in a village for an indefinite time after construction ceases. As part of that continued occupation, early beams can be reused in later construction. There are reasons to believe that the occupation at Pottery Mound did, in fact, continue after 1427, though perhaps at a reduced level. Obviously, more absolute dates are required to fully assess the span of the occupation. In the future, radiocarbon dates on corn cobs and other macrofloral remains may be the most promising approach.

Lack of Glaze B

Glaze B rims are dated to 1400–1450 in the Galisteo Basin and Santa Fe area. There is no doubt that Pottery Mound was occupied during this period, but the corresponding rim forms are weakly represented. Typically, 5 percent or less of each of the major types at the site has B rims. Instead, production of much of the existing glazeware pottery continued, adding Glaze C rim forms to the repertoire. The virtual lack of Glaze B in this southern glaze range was recognized by Mera (1940:3), who commented: “Farther south, where this form occurs only sporadically, Group A is believed to have merged directly into C with no intermediate forms.”

Glaze C Occupation

Continued occupation after 1450 is likely. Voll (1961) placed the site’s end between 1450 and 1490, citing the presence of glaze C rims. Such rims have been noted by everyone who has looked at the ceramics since, including visitors to the ruin on recent field trips. Glaze C rims are not rare in the collection; they occur regularly on San Clemente and Pottery Mound Glaze Polychrome, and even on Agua Fria Glaze-on-red (Table 9). Pottery Mound Glaze Polychrome is itself a Glaze A through Glaze C type, following the standard Mera rim morphology. On sherds with Glaze C rims, one of its traits is the use of three colors on a single surface (and in

some cases, four or even five colors on a surface). At least 40 percent of the Pottery Mound Polychrome rims fall into the Glaze C shape range (as defined in Figures 5 and 6), according to Tables 8 and 9. The appearance of Glaze C rims on Kuaua, San Clemente, Agua Fria, and Cieneguilla (in descending order of percentage) is another indication that most glazeware types extended into the C rim "horizon" while changing little else of their makeup (Figure 42).

Ending dates on some intrusive types at Pottery Mound go as late as 1500, or later (Table 1). Specifically, Espinoso Glaze Polychrome, Biscuit B, Sapawe Micaceous, Potsuwii Incised, the Acoma-Zuni glazes, and Hopi Sikyatki Polychrome all run this late in their home territories. As a group, these types are adequately dated in their regions of manufacture, and thus add weight to the argument that Pottery Mound until 1500, albeit with fewer people than at its peak.

At Pottery Mound, therefore, the suggested time spans of the major glazeware types have been extended somewhat. These changes are summarized in Table 10. The time spans of the Glaze A types are extended, for example, so that they last into the Glaze C rim form period.

Concurrent Production of Several Types

A very obvious result of the analysis is that several types were in production at the same time. This was implied by the extensive overlap in their previously assigned dates (Table 1). The Pottery Mound stratigraphy confirms that several glazeware types were often in production concurrently, although not necessarily with the same degree of popularity. The assigned dates from the literature (Tables 1 and 2) are supported by the stratigraphic data (Tables 5 and 6) in that all glazeware types overlap to some degree in time. Even so, an overall trend from Agua Fria Glaze-on-red and Cieneguilla Glaze-on-yellow, into San Clemente Glaze Polychrome, and from there into Kuaua and Pottery Mound Glaze Polychrome, is confirmed by the traditional dates (Table 2), by attribute seriation (Figure 40), by stratigraphy (Tables 5 and 6), by rim form changes by level (Table 7), and by rim form changes within the glaze types (Table 8 and 9). The evolution of these types is thus quite well documented. Nevertheless, the persistence of one type alongside another is reflected in the changes in rim form, within types based on stylistic attributes. Assuming that the rims changed as described in the literature (Figures 5 and 6), all of the Pottery Mound types apparently crossed the Glaze C rim threshold, but in differing amounts. Small quantities of the Agua Fria and Cieneguilla rims are Glaze C rims. Somewhat more of the San Clemente rims are Glaze C (Table 9), which correlates with a trend toward exterior white slip (combined with red interior slip), the use of chalky white slip, and incurving bowl sides ("shouldered bowls"). This trend culminates in classic Kuaua Glaze Polychrome, displaying all of the traits just described, together with a preference for exterior paint application rather than the more traditional interior bowl paint application. At the same time, the developmental track leading to Pottery Mound Glaze Polychrome preserves the contrast between chalky white slips and slips of a tan, buff, or olive hue. Rim forms again vary, but a high percentage of Pottery Mound Glaze Polychrome rims (40 percent) are Glaze C forms.

What emerges, as is suggested in Figure 42, is that while all major types (defined by painted decoration) may have overlapped, their percentages and rim forms changed steadily over 175 to 200 years, from 1325 or 1350 to 1525. Almost all lasted long enough to display at least some

percentage of Glaze C rims. Very little Agua Fria Glaze-on-red was being made as this horizon line was reached, but substantially more San Clemente and Pottery Mound Glaze Polychrome were made above this horizon line. Almost all of the Kuaua Glaze Polychrome was made during the C rim horizon. But, again, a continuum is visible. The evolution of rim forms cross-cuts changes in painting styles. Taxonomically, this is important because rates of change in design styles and bichromy versus polychromy differ from those rim for forms. There is no neat, one-to-one correspondence. Instead, most design styles lasted long enough to have been produced with several rim forms—the latter being a chronologically sensitive trait, as Shepard, Kidder, and Mera pointed out. For this reason, the terms "Largo" and the "Espinoso" have been avoided for Glaze B and C rims, respectively, except in the case of clearly intrusive examples. For locally made glazeware, it is preferable to simply refer to the design style (e.g., "Agua Fria"), together with the appropriate rim letter (A, B, or C).

Cultural Implications of Multiple Synchronous Types

Pottery Mound Glaze Polychrome clearly owes a debt to all the earlier glazeware types. The use of multiple colors on each surface, along with the incorporation of design elements from Hopi, Acoma, and Zuni, resulted in a finely made product that was the climax of the glazeware sequence. But if Pottery Mound Glaze Polychrome is not always later than the other types, did it have a special purpose? Or was it produced by a few potters only? The current data throw no light on these intriguing questions. The numbers show, however, that this type never dominated the glazewares. The low frequencies suggest that Pottery Mound Polychrome was not part of every potter's repertoire. We can also infer that it was produced for a limited range of uses. Either way, it may have played a special role within the village.

The great range of variation within San Clemente group, leading to a number of sorting varieties, suggests that multiple varieties of San Clemente were in production concurrently. To what extent this is due to differential adoption of ideas from imported ceramics, or to synchronic variation among potters from different families, clans or "mini" traditions, or both, is difficult to assess.

In any event, at no other time in Puebloan prehistory were so many types and varieties produced at the same time, within a local production sphere. The heterogeneity observed at Pottery Mound probably applies to the other Pueblo IV glazeware-producing villages. The cultural implications of this variability remain largely unexplored, although Eckert (2003) has offered some explanations of this diversity.

Spatial Differences within Rio Grande Glaze Ware

While glazeware development at Pottery Mound followed the broad patterns of the Rio Grande glazeware sequence as a whole, there are differences between the southern glazeware range versus the much better studied northern range—the latter including the Santa Fe, Pecos and Galisteo districts, where most early glazeware research was conducted (e.g., Mera 1933, 1935, 1940; Kidder and Shepard 1936).

In general, early glaze trends were the same in the north and the south. The first indigenous Rio Grande glazewares were probably made in the Albuquerque area (Mera 1933; Schaafsma 1969). The next stages involved sherd-tempered Glaze A red, then crushed-rock-tempered Glaze A red, then Glaze A with a yellow slip. This sequence within Glaze A was clearly documented at Las Madres (Schaafsma 1969), where it occurred between about 1350 and 1425 (Schaafsma 1969:21–24). Although the same pattern is evident in both north and south, there is no guarantee that specific developments were coeval. The transition to rock temper and the adoption of a yellow slip probably occurred sooner in the south, the "birthplace" of Rio Grande glazewares, for example. It is important to remember that the timing of parallel changes may not have been synchronous throughout the glazeware province.

A second regional difference is the one already discussed: the near lack of Glaze B rims in the southern range. Instead, Glaze A rims persisted until at least 1450, if not later.

A third difference is the development of slip and paint arrangements. In the north, the transition from bichromes to three-color polychromy on a single surface occurred sooner than in the south. That is, red designs outlined with black glaze paint started in the north at least by Glaze B (ca. 1425–1450). Specifically, Cieneguilla Glaze-on-yellow and Glaze Polychrome with A rims grew into Largo Glaze Polychrome with B rims, then into Espinoso Glaze Polychrome with C rims (all with three colors on a single surface). The southern evolutionary path was different. Black-on-red pottery began with Glaze A rims and persisted at least through Glaze B times, alongside its black-on-yellow counterpart. Polychromy also took a different track. Instead of involving three colors on one surface, San Clemente divided its colors between two surfaces, one with a white background and the other with a red background. Black paint could appear on either surface. Thus polychromy was achieved, but only on the vessel as a whole. San Clemente is most common in the south. The elaboration of the San Clemente red versus white slip theme at Pottery Mound does not seem to occur in the northern area. Use of contrasting slips, then multiple slips and paints on the same surface, seems especially developed at Pottery Mound, in the transformation of San Clemente Glaze Polychrome into Pottery Mound Blaze Polychrome. This type was the first to show multiple colors on a single side of the vessel. As many as five colors might appear on a single surface.

The local stylistic trajectory was thus not as straightforward or "linear" as was the sequence in the north. Although the general trajectory followed regional trends, several design styles were in use at any given time. Obviously, the need for more absolute dates associated with these varieties is essential to clarify changes in style and the relationships between north and south Rio Grande glazeware varieties.

The End of Pottery Mound

Finally, it is apparent that the occupation of Pottery Mound lasted until Glaze D times, which span the period 1490–1525. The Glaze D rims were confirmed by several individuals, so there can be little doubt as to their identity. The sherds in question conform precisely to the published descriptions of San Lazaro Glaze Polychrome. The finding of six Glaze D rims in the assemblage from the 1979 test pit, along with many more on the surface of the main mound and of an

outlying portion of the site, suggests that a small Glaze D occupation does, in fact, exist here, even though a Glaze D layer was not been identified in the test pit. Presumably, the Glaze D pottery was made by the last remnants of the Pottery Mound population before they, too, left the pueblo. The paste and temper in the Glaze D sherds appear to match those of other, clearly locally made Pottery Mound glaze types. Mera, having visited Pottery Mound, describes the duration of occupation that "covered a span from A to E" (Mera 1940:18). Recent re-examination of Mera's collection from the site housed at the Laboratory of Anthropology in Santa Fe by David Snow (personal communication) confirms this.

It is interesting that very little stylistic evolution of the D sherds out of Pottery Mound Glaze Polychrome is evident. A clear continuum of attributes, over time, connects Agua Fria, San Clemente, Kuaua, and Pottery Mound Glaze Polychrome (Figure 40). The Glaze D sherds are not a decorative outgrowth of the last expression of this series, Pottery Mound Glaze Polychrome, but follow the more general and widespread San Lazaro style. The painted designs on the Glaze D sherds are thus no longer unique to Pottery Mound, even though most specimens exhibit the local paste and temper. One explanation is that after the end of the main occupation, a few stragglers made pottery, but only in a generic style. The peak of ceramic design achieved in Pottery Mound Glaze Polychrome was gone.

The relict population left sometime between 1490 and 1525, that is, sometime after Glaze D rim production began. It is thus possible that the site was still partly occupied into the early 1500s. In the Rio Grande Valley, a similar decline in population hit almost every village. At Valencia Pueblo there was a "sharp decline at about A.D. 1500, after which very few residents remained" (Franklin 1997:218). A similar trend affected all of the Pueblo IV, Glaze A through C sites in the southern glazeware region, including Gran Quivira, Nuestra Señora, Tijeras Pueblo, San Antonio, Paa-ko, Qualacu, and Chamisal. Tree-ring data indicate a drought during the late 1400s into the early 1500s. In severity, it was equivalent to the "Great Drought" that disrupted Pueblo III populations in the Four Corners area. Even if the few remaining inhabitants had survived this drought, by 1540 the arrival of Europeans (Ellis 1956) and their diseases would have sounded the death knell for the village.

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Appendix A

CERAMIC ANALYSIS FORM

Pottery Mound (LA 416) Ceramic Analysis in 2005 – H. Franklin for 1979 Field School page. . Entered______

Identification:
Sequence Num:_________ UNM Box # _______ UNM bag # 2005.27.___________
Provenience:
Grid or Room_________________________ Level___________Depth_________Feature____________
Quad________Horizontal Coordinates_________________Date___________________

Analysis Data:

Seq. Num	Type	Form	Part	Temper1	Temper2	Rim shape	Rim dia.	Rim arc	Code	Count

Appendix B

ANALYSIS CODES

Pottery Mound LA 416 Analysis H. Franklin May 1, 2005
Pottery Type Codes (all sherds over 1 cm square are analyzed and counted) (all intrusive sherds, all PM Poly, all sherds with exotic temper, any sherd that requires further analysis will be pulled and placed in separate bag)

Matte Painted Types
10 Red Mesa Black/White
11 Puerco-Escavada Black/White
12 Socorro Black/White
13 Chupadero Black/White
15 Santa Fe Black/White
20 Wiyo Black/White
25 Biscuit A (Abiquiu B/W)
30 Biscuit B (Bandelier B/W)
50 St. Johns Poly.
55 Heshotauthla Poly. (light glazed black paint, sherd temper)
70 Historic Tewa black/cream

Rio Grande Glaze body or rim sherds with no painted decoration visible:

91 exterior red, interior red or orange (prob. Agua Fria or Largo G/R)

92 exterior red, interior white or yellow, or vice versa (prob. San Clemente)

93 exterior white or yellow, interior white or yellow
(prob. Cieneguilla G/Y, Poly., or Largo G/Y, or Espinosa Poly. or San Clemente jars)

96 exterior red, interior orange or olive (prob. part of Agua Fria or PM Poly)
(hard to ID. See code 91 above)

97 generic plain red, orange, white, or yellow

GLAZE A: (in the Mera rim shape classes)

(rim is not always required for identification of specific types)
100 Glaze A: unidentified)
101 Los Padillas Poly. (white in design with black glaze paint on red slip)
105 Arenal Poly. (same as Los Padillas Poly? but rock temper).

110 Agua Fria Glaze/Red
111 Agua Fria G/R with light red or orange on interior
112 Agua Fria Poly. (white filler in Agua Fria Glaze/red)
(Black glaze paint well controlled over red or orange-buff slip)
(This category may also contain some sherds of PM poly, Largo G/r, or Los Padillas-Arenal G/r)

115 San Clemente Poly. (red ext. chalky white int. with black glaze paint)
116 San Clemente Poly. (red ext. creamy yellow int. with black glaze paint).
117 San Clemente Poly. (chalky white slip ext, red slip int., jars white slip ext. only)
118 San Clemente Poly. (creamy yellow slip ext, red slip int., jars white slip ext. only)
119 San Clemente Poly (white or creamy slip on both sides of bowl)
(This type should be recognizable from any bowl sherd- jars prob. Cieneguilla Poly)

120 Cieneguilla Glaze/Yellow (black glaze paint on yellow slip int. and ext on bowls)
121 Cieneguilla Poly. (red matte filler with black paint on yellow ground)
(This type may not be distinguishable from San Clemente in jar form.
Also, the Poly variant have many body sherds in the G/yellow category.
Overlaps in definition with Pottery Mound Poly (yellow slip variety) Only intrusive poly placed in this category).

125 Pottery Mound Poly. (generic)
(black paint around red designs on a
orange, buff or olive background, Glaze A rim.)
(Voll includes a white slip, and cream slip variety, coded below).
(Is the white slip variety not Cieneguilla G/poly?)
(This is a tight category. It is recognized securely only when red paint occurs on the same surface with black paint over a red or orange-buff-white slip. Many sherds without red paint may be classed as Agua Fria (110 or 111) or as the unpainted body sherds 91 or 96 (above), so probably this type is underrepresented in stats)
126 Pottery Mound Poly, orange to buff slip variety
127 Pottery Mound Poly, chalky white slip variety.

GLAZE B:

200 Glaze B: (rim but unidentified)
201 Largo Glaze/Yellow
205 Largo Glaze/Red
210 Largo Poly. (Medio Poly.)

GLAZE C:

300 Glaze C: (rim but unidentified)
301 Espinosa Poly.
302 Kuaua Poly.

GLAZE D:

400 Glaze D: (rim but unidentified)
401 San Lazaro Poly.

GLAZE E:

500 Glaze E: (rim but unidentified)
501 Puaray Poly. (Encierro Poly., Escondido Poly., Masada Poly.)
510 Pecos Poly.

GLAZE F:

600 Glaze F (rim but unidentified type)
601 Kotyiti Poly.
610 Kotyiti Glaze/yellow (Lemitar Gl/yellow)
615 Kotyiti Glaze/red
620 Trenaquel Poly. (Polvadera Poly.)
(southern version of Glaze F)

Utility (unpainted) Ware:

701 Clapboard Corrugated (incl. Corona Smeared-Indented)
705 Indented Corrugated
706 Obliterated Corrugated (can still see coil joints but wiped over)
710 Plain Gray (no mica in paste)
715 Plain Gray (micaceous paste)
(720 changed to 91 - plain red)
725 Los Lunas Smudged
730 Sapawe Micaceous Washboard
740 Cibola – Acoma plain utility
799 unknown plain utility

Acoma, Zuni and Hopi Painted:
810 Kwakina G/p (Zuni) A.D. 1275-1425
820 Pinnawa G/w A.D. 1375-1425
830 Generic Acoma-Zuni glaze

850 Jeddito B/y
860 Sikyatki Poly
870 Generic Hopi yellow
880 Hopi utility plain ware (also code 750?)
881 Hopi utility, corrugated

Miscellaneous types:

735 Plain ware, punctate
999 unknown type or clay materials

Vessel Form codes:

1 = jar (all plain utility body sherds are in here – can't tell jar from bowl in this type unless you have a rim. Rim sherds are separated into jar/bowls.)
2 = bowl
3 = figurine (effigy)
4 = ladle
5 = soup plate with flare rim
6 = seed jar
7 = pipe
8 = drilled disk
9 = unknown
10 = test pot
11 = raw unfired clay

Vessel Part codes

1 = body
2 = rim
3 = handle
4 = lug
9 = unknown or raw clay

11 = raw clay unfired

TEMPER codes:

1 = potsherd
2 = black or gray vesicular basalt
3 = red vesicular basalt
4 = black and red (mixture) vesicular basalt
5 = vitrophere (shiny black)
6 = quartz sand
7 = sandstone
8 = intermediate igneous rock (andesite, diorite)
9 = latite fine grained porphyry with olivine? (poikilitic texture) (intrusive?)
10 = schist (not large flakes of mica)
11 = mica (muscovite or biotite)
12 = fine grained gray rock (diabase?)
13 = ? white stuff (potsherd or calcium carbonate) (usually found with basalt)
14 = volcanic tuff
99 = unknown or none

RIM SHAPE codes: (should be sufficient for Glaze A)

1 = straight, round lip
2 = straight, flattened lip
3 = straight, angled (beveled) lip
4 = outcurve, round lip
5 = outcurve, flattened lip
6 = outcurve, angled (beveled or tang) lip
7 = incurve, round lip
8 = incurve, flattened lip
9 = incurve, angled (beveled) lip
10 = straight, thickened, round lip (Glaze B?)
11 = straight, thickened, flat lip (Glaze B?)
12 = elongated and thickened (Glaze C – D)

RIM Diameter (in cm.)

measure to closest cm. on board
done on all sherds with at least 15 degrees of rim arc
left blank when degrees of arc are less than 15

RIM Degrees of Arc

In degrees measured on board
Done on all sherds with at least 15 degrees of arc.
Smaller sherds are not given rim diameters, and assigned 8 degrees of arc as an average reading.

COMMENT codes:

1 = good for photo
2 = smudged surfaces
3 = drill holes
4 = worked edges
5 = pulled for temper
6 = unfired
7 = pulled for special type collection (study or photo later)
8 = light yellow or buff paste

Count

frequency of this combination of attributes within the bag
(specialized analyses will be done on pulled samples for oxidized color, petrographic, and possibly weight, all with pulled subsets)

Appendix C

LIST OF DIGITAL PHOTOGRAPHS

The photographs listed below may be found on the compact disk in the pocket in the back of paper copies of the report. All photographs are by Hayward F. Franklin.

Folder: Rio Grande Glaze Ware

1. Agua Fria Glaze-on-red, red slip variety
2. Agua Fria Glaze-on-red, orange slip variety
3. Cieneguilla Glaze-on-yellow bowl, interior
4. Cieneguilla Glaze-on-yellow bowl, interior
5. San Clemente Glaze Polychrome bowls, interior
6. San Clemente Glaze Polychrome bowls, exterior
7. San Clemente Glaze-on-red jars, exterior
8. San Clemente Glaze Polychrome bowl, chalky slip, exterior
9. San Clemente Glaze Polychrome bowl, chalky slip, interior
10. San Clemente Glaze Polychrome, white both sides, exterior
11. San Clemente Glaze Polychrome, white both sides, interior
12. San Clemente Glaze Polychrome, creamy slip, interior
13. San Clemente Glaze Polychrome, creamy slip, exterior
14. San Clemente Glaze Polychrome, interior and exterior
15. San Clemente Glaze Polychrome, interior and exterior
16. Kuaua Glaze Polychrome beveled rims, exterior
17. Kuaua Glaze Polychrome beveled rims, interior
18. Kuaua Glaze Polychrome bowls, exterior
19. Kuaua Glaze Polychrome bowls, interior
20. Kuaua Glaze Polychrome, exterior
21. Pottery Mound Glaze Polychrome bowl, interior
22. Pottery Mound Glaze Polychrome bowl, exterior
23. Pottery Mound Glaze Polychrome, white slip and tan slip varieties
24. Pottery Mound Glaze Polychrome bowls and jars
25. Pottery Mound Glaze Polychrome with unbounded red areas
26. Pottery Mound Glaze Polychrome, white slip variety
27. Pottery Mound Glaze Polychrome, tan-olive slip variety
28. Pottery Mound Glaze Polychrome, late (L) and early (R), interior
29. Pottery Mound Glaze Polychrome, late (L) and early (R), exterior
30. Pottery Mound Glaze Polychrome early bowl, interior
31. Pottery Mound Glaze Polychrome, white and tan-olive slipped varieties
32. Beveled rims on San Clemente, Cieneguilla, and Agua Fria bowls, interior
33. Glaze B rims (L) and Glaze D rims (R) , interior
34. Glaze B rims (L) and Glaze D rims (R) , exterior
35. Glaze D San Lazaro Glaze Polychrome rim

36. Glaze D San Lazaro Glaze Polychrome bowl, interior
37. Glaze D San Lazaro Glaze Polychrome bowl, exterior
38. Sloppy glaze on polychrome and Glaze-on-yellow sherds
39. Glaze C and D from northeast end of the site, interior
40. Glaze C and D from northeast end of the site, exterior

Imported Pottery

41. Socorro Black-on-white
42. Socorro Black-on-white (upper), Los Lunas Smudged (lower)
43. Biscuit A (L) and B (R), interior
44. Biscuit A (L) and B (R), exterior
45. Late glaze, Pottery Mound Glaze Polychrome, Hopi, and Sapawe micaceous types
46. Hopi Sikyatki and Jeddito yellow ware
47. Hopi Jeddito Black-on-yellow
48. Hopi handle with corn design
49. Hopi corrugated, plain, and painted ware
50. Acoma-Zuni glazeware
51. Acoma-Zuni polychrome glazeware
52. Acoma-Zuni glazeware, interior
53. Acoma bowls (upper) and jars (lower)
54. Large Acoma bowl rim, interior
55. Acoma painted and corrugated wares

Utility Ware

56. Clapboard corrugated, Los Lunas smudged
57. Clapboard corrugated jars
58. Obliterated corrugated (upper), indented corrugated (lower)
59. Plain gray bowl, straight and curved jar rims
60. Small test pots, local clay and temper


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