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MISSION STATEMENT

Pottery Southwest, a scholarly journal devoted to the prehistoric and historic pottery of the Greater Southwest (<http://www.unm.edu/~psw/>), provides a venue for students, professional, and avocational archaeologists in which to publish scholarly articles as well as providing an opportunity to share questions and answers. Published by the Albuquerque Archaeological Society since 1974, *Pottery Southwest* is available free of charge on its website which is hosted by the Maxwell Museum of the University of New Mexico. This issue is in honor of the Albuquerque Archaeological Society's 50th Anniversary. The Winter issue of *Pottery Southwest* will provide a report on the 50th Anniversary Party.

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POTTERY KILNS AND THEIR RELATIONSHIP TO UNIT PUEBLOS IN SOUTHEASTERN UTAH

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In the Mesa Verde culture area, archaeological evidence indicates that pottery production was carried out at the household level (Brisbin 1999; Fuller 1984; Mobley-Tanaka 2001; Purcell 1993; Severance 2015). However, the relationship between prehistoric pottery kilns and unit pueblos in the Four Corners area is a subject that has not been fully examined. The published papers describing excavated kilns have focused on their physical characteristics along with discussions on how they were used (Blinman and Swink 1997; Brisbin 1999; Fuller 1984; Heacock 1995; Helm 1973; Purcell 1993). Because most of the kilns that have been excavated are located at a distance from habitation sites, their relationship with the people who built and used them has not been established. An exception is found in Mobley-Tanaka's (2001) paper which re-examined the excavation records for 5MT1 and 5MT3 in southwestern Colorado, sites that were excavated by the University of Colorado Museum under the direction of Dr. Joe Ben Wheat between 1957 and 1991 (Figure 1). She describes one Pueblo II and four Pueblo III kilns that were located at those sites and were used to fire gray ware. In southeastern Utah, I have found a relationship between unit pueblos and pottery kilns at eight Pueblo II and Pueblo III unit pueblos.

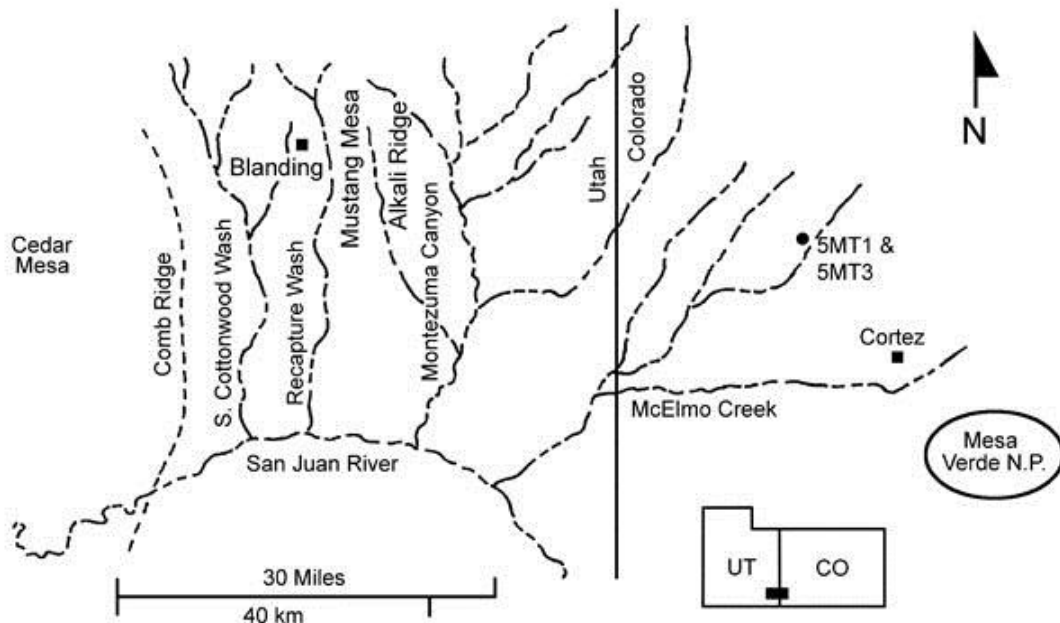


Figure 1. Southeastern Utah and the area being discussed.

In a previous paper (Severance 2015) I discussed how the size and shape of kilns evolved from Basketmaker III through Pueblo III. The earliest kilns were round, about one meter in

diameter with the size increasing during Pueblo I to about 1.5 meters. During Pueblo II the shape changed from round to oval and then to sub-rectangular, and finally, during Pueblo III the shape became generally rectangular, sometimes with one or more rounded corners. Of course there are occasional exceptions to these general shapes. Kilns with a long axis are found aligned in all compass directions and can be oriented either perpendicular to or parallel with the slope in a variety of topographic situations (Severance 2015:115-117). Some of the kilns had been used more than once as indicated by the discarded kiln furniture nearby. This debris was the result of the kilns being cleaned out to prepare for another firing (Severance 2015:115, 116).

SITE DESCRIPTIONS

The prehistoric occupation in southeastern Utah was sufficiently dense that trying to determine which kilns were used by a specific family unit can be difficult. However, some places were previously not occupied so that when people moved into these areas, the relationship between the habitation sites and nearby kilns can be determined. At the end of the Pueblo I period (A.D. 750-900) or the beginning of the Pueblo II period (A.D. 900-1100), there was a general migration of people out of the area west of Comb Ridge (Severance 2008:154) (Figure 1). It is probable that many of these people moved into the part of southeastern Utah that is east of Blanding. This area appears to have been mostly vacant at that time; as a result, the association between kilns and specific Pueblo II unit pueblos can be determined in a few places. Figures 2 through 6 show some of these Pueblo II locations. The white areas on the maps, near the unit pueblos (red circles), are the mesa top; the soil here is deep and covered with sagebrush. This eolian soil is a fine sandy loam that was blown into the area and covers much of southeastern Utah and southwestern Colorado (Olsen et al. 1962). It was farmed in prehistoric times and is still being farmed in many areas. The gray area is the Pinyon/Juniper forest near the mesa rims and on the steep slopes below the rims. The soil is shallower near these rims and is cut by small drainages; this is where the kilns (red dots) were found (Severance 2015:115). The contour interval on these maps is 20 feet.

The following is a reconstruction of how the land around these unit pueblos was used. It appears that as soon as people moved in during the Pueblo II period, they started harvesting or cutting down the trees closest to where they were living to provide wood for fuel and construction. Over time this necessitated removing trees farther and farther away from their homes. At the same time, their corn crops were depleting the soil so that when they moved away, the environmental degradation probably was such that these areas were not re-occupied during the Pueblo III period (A.D. 1100-1300). As a result, the Pueblo III people who moved into communities in the A.D. 1200s had to go beyond previously occupied areas to find places that still had wood resources where they could fire their pottery. These areas, as in southwestern Colorado, have large numbers of kilns more than a mile from where the potters were living (Fuller 1984:52). Not all of the people living in southeastern Utah during Pueblo III moved into communities; some continued living in unit pueblos (Wintch 1990:82, Figure 18). Fortunately we have a few of these Pueblo III sites with associated kilns that appear to be much as they were when their occupants moved to new areas.

The primary changes since southeastern Utah was depopulated in the A.D. 1200s are that many of the kilns are now only partially visible because of erosion or the deposition of wind-blown soil and the Pinyon/Juniper forest has recovered. Several of the partially visible kilns have only a few slabs, usually in a parallel alignment about one meter apart. All of these Pueblo II and Pueblo III unit pueblos at are elevations between 5350' and 5740' and have middens to their south and/or east. None of them have site numbers.

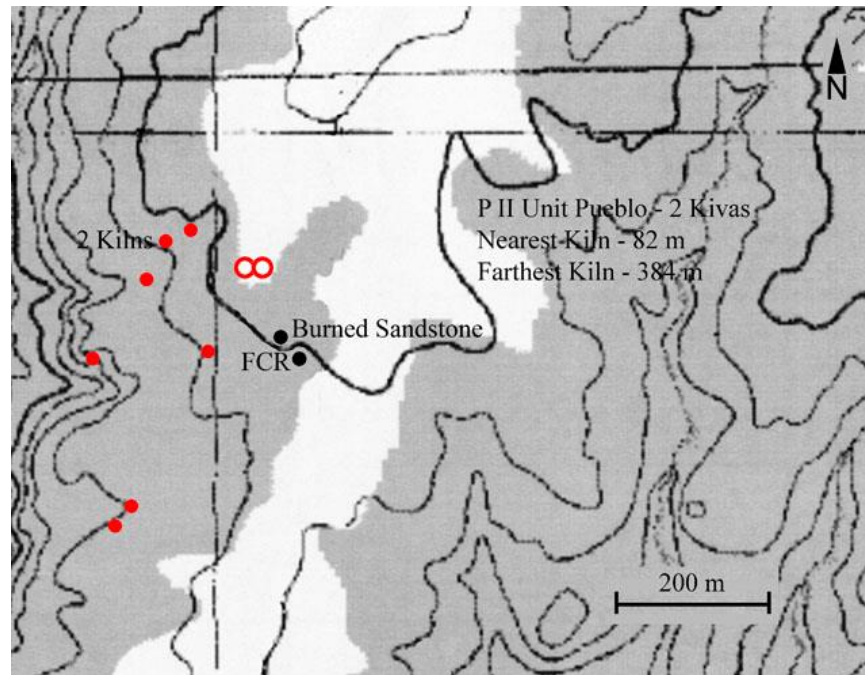


Figure 2. A unit pueblo with two kivas and eight associated kilns.

One of the kilns is somewhat round; two are oval-shaped; three are more-or-less rectangular; and two do not have enough vertical slabs visible to determine their sizes or shapes. At least one kiln appears to have been used more than once. The drainages with the kilns slope toward the southwest. The only other features that were visible in this area consisted of some fire-cracked rock (FCR) and some pieces of oxidized (burned) sandstone.

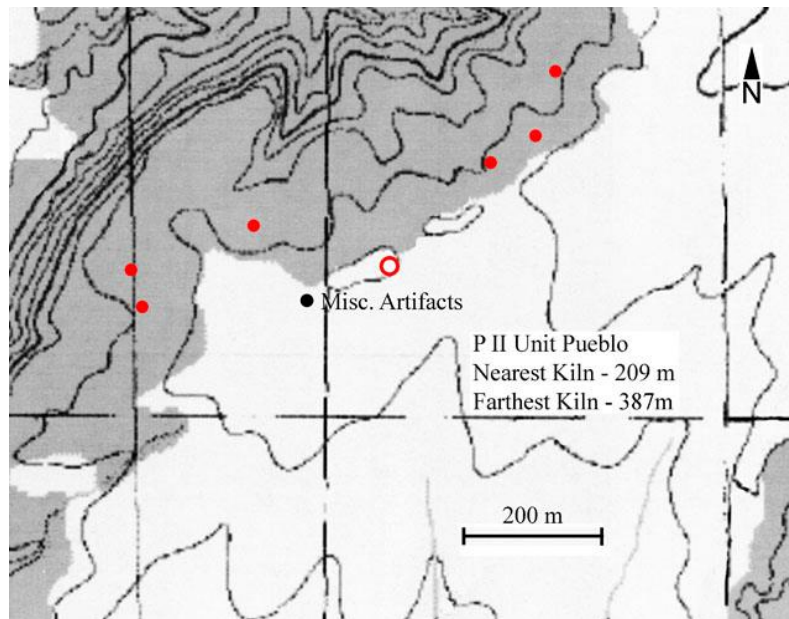


Figure 3. A unit pueblo with one kiva and six associated kilns.

Two of them are round; one has a round end; two are more-or-less rectangular; and one does not have enough slabs visible to determine its size or shape. At least four of the kilns appear to have been used more than once. The drainages with the kilns slope toward the north, northwest, and southwest. Some miscellaneous artifacts are located 140 m southwest of the unit pueblo.

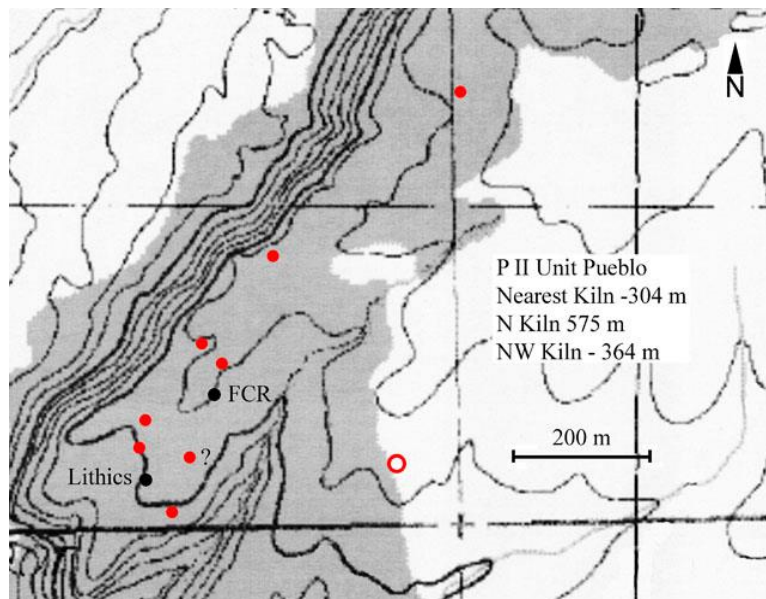


Figure 4. A unit pueblo with one kiva and seven (possibly eight) kilns.

One has a round end; one has an oval shape; one is more-or-less rectangular; and four do not have enough slabs visible to determine their sizes or shapes. At least two appear to have been used more than once. The possible kiln is not complete enough to determine if it is a kiln or some other feature. The drainages with the kilns slope toward the west, south, and southwest. Other features include a concentration of fire-cracked rock with lithics and a lithic scatter.

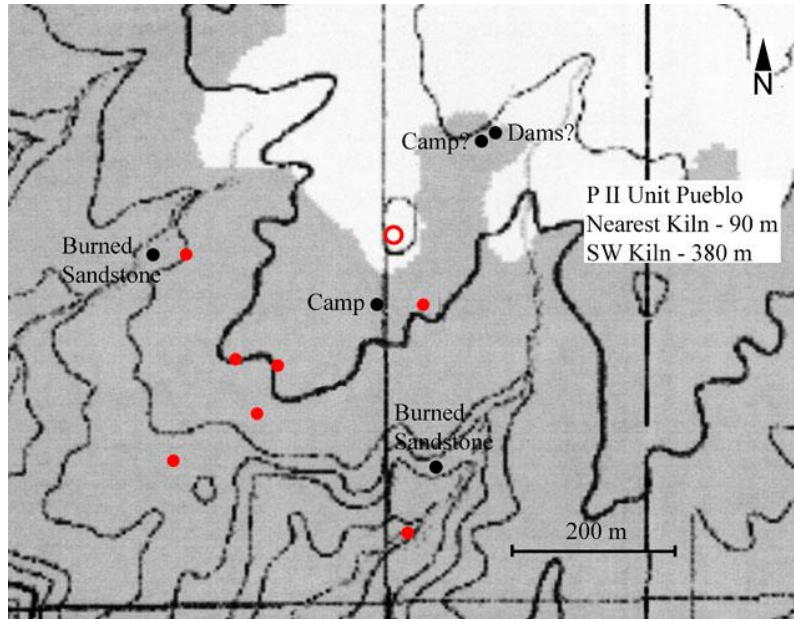


Figure 5. A unit pueblo with one kiva and seven associated kilns.

One is round; two are oval-shaped; two are more-or-less rectangular; and two do not have enough slabs visible to determine their sizes or shapes. At least three appear to have been used more than once. The drainages with the kilns slope toward the south and southwest. Other features include two locations with oxidized sandstone, two short-term camp sites with slab-lined fire pits and a few lithics, and several possible dams.

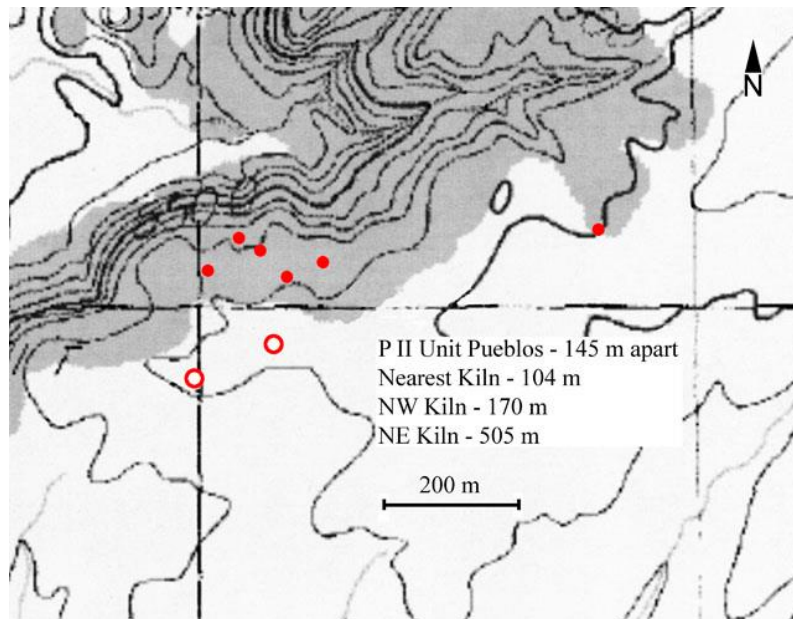


Figure 6. Two unit pueblos that appear to be contemporary, each with one kiva.

It is unusual to see two unit pueblos from the same time period this close together. I would expect to see a two-kiva unit pueblo instead. The northern unit pueblo has five associated kilns with a sixth kiln 505 m distant that may also have been used by this family unit while the southern unit pueblo has none. One kiln is 1 m x 1 m and one kiln is divided, indicating more than one use (Severance 2015:117, 118). The other four do not have enough slabs visible to determine their sizes or shapes, however, at least two of these appear to have been used more than once. The drainages with the kilns slope toward the northwest.

I have found three Pueblo III unit pueblos that also appear to have been the only occupations at their locations so that their relationship with nearby kilns can be determined. One is east of Blanding and two are west of Blanding.

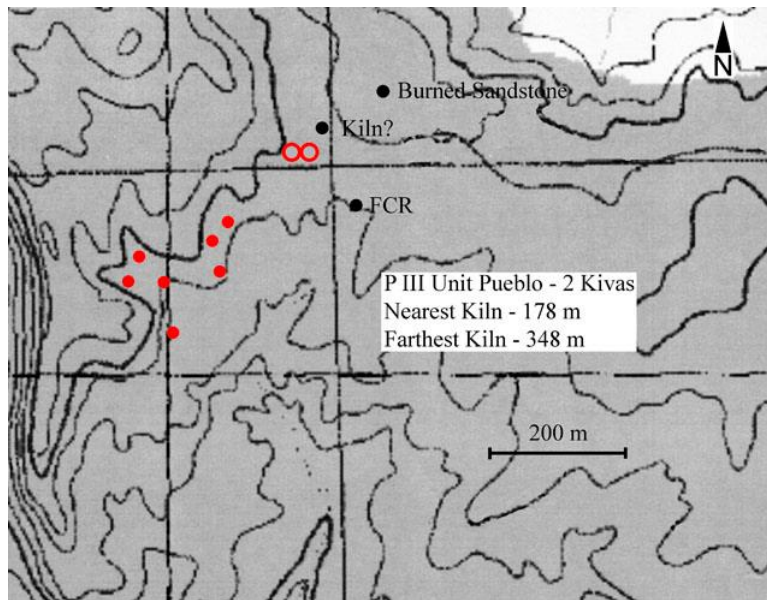


Figure 7. A Pueblo III unit pueblo with two kivas and seven associated kilns.

One kiln is round; one has a round end; five do not have enough slabs visible to determine their sizes or shapes. At least four appear to have been used more than once. The drainages with the kilns slope toward the south and southeast. Other features include a burned feature that may be another kiln, a concentration of fire-cracked rock, and some oxidized sandstone.

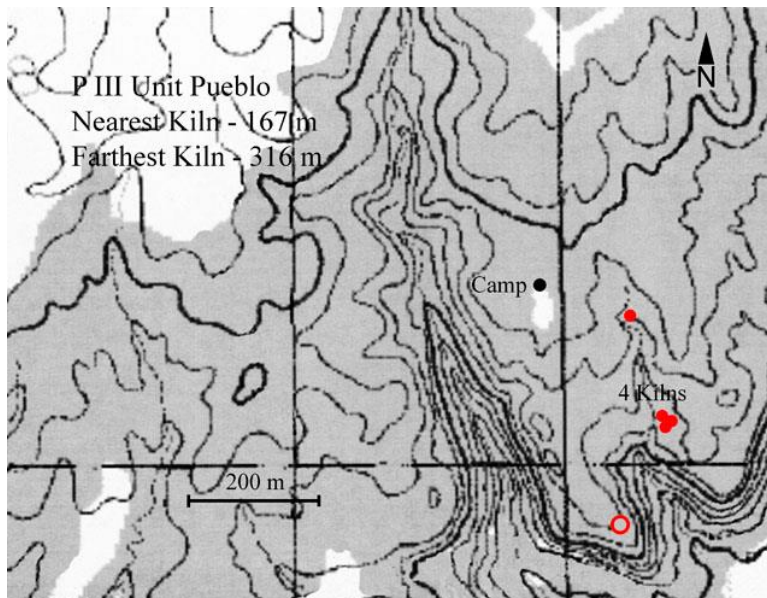


Figure 8. A Pueblo III unit pueblo with one kiva and five associated kilns.

Four of the kilns are close together with the fifth one being located 150 m farther up the drainage. One kiln has a round end; one is oval in shape; two are rectangular; one does not have enough slabs visible to determine its size or shape. The drainage with the kilns slopes to the south. A short-term campsite is the only other feature in this area.

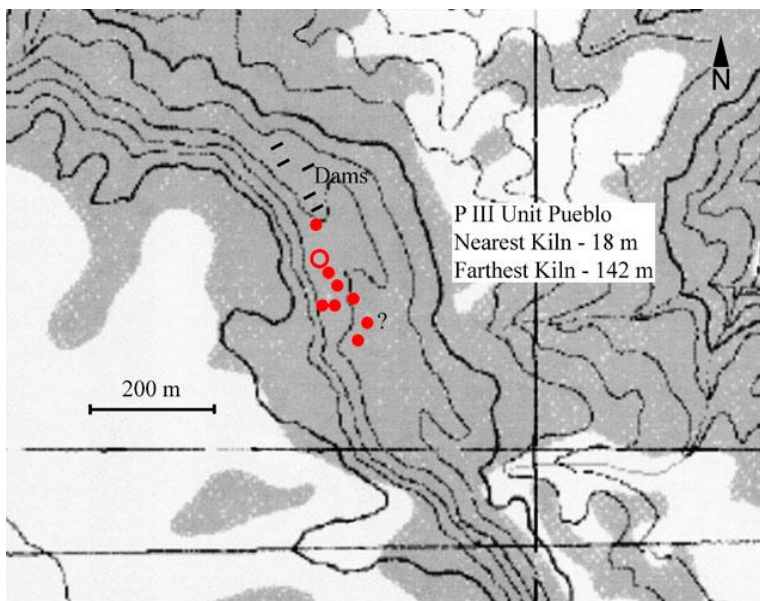


Figure 9. The contour intervals are 40 feet.

This Pueblo III unit pueblo is located on a bench below a mesa. Seven kilns are associated with this site along with a possible eighth one. Because of erosion and possible prior illegal excavations, I was not able to determine the size and shape of these kilns and whether they had been used more than once. The drainages with the kilns slope to the east and southeast. The only other features besides the possible kiln are five check dams in nearby drainages.

While it cannot be conclusively stated that the kilns located near these unit pueblos are the only ones used by the people living there (there are other kilns in these areas that, in my opinion, are too far from the habitation sites to determine ownership), the number of kilns associated with each unit pueblo is more than I expected to find and is an indication that large numbers of kilns were being constructed and used in southeastern Utah during the pueblo occupation.

CONCLUSIONS

In the area east of Blanding, Utah, a few Pueblo II unit pueblos each had five to eight kilns nearby, some of which had been used more than once, for a probable minimum of eight to ten firings during the time that these unit pueblos were occupied. It appears that as the wood resource near these unit pueblos was used up, and, as the soil fertility was probably depleted after years of corn crops, the people who had settled at these sites moved to more productive places. Pueblo III people did not occupy these locations, most likely because of the depleted resources.

As a result, these sites provide good examples of single occupation sites and their relationship to pottery firing features. Also in southeastern Utah, Pueblo III unit pueblos can be found in similar situations, indicating that during the period of about A.D. 900-1300, individual family units used multiple kilns to fire substantial amounts of pottery at each location where they lived. Therefore, pottery kilns are likely the most common archaeological feature in southeastern Utah.

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**CHUPADERO BLACK-ON-WHITE COILED VARIETY
AND ITS PLACEMENT AMONG THE SOUTHWESTERN CERAMICS**

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In the vast open basin floors and mountain ranges of southern and southeastern New Mexico and west Texas, Chupadero Black-on-white used to be a common household pottery for the El Paso phase Jornada Mogollon. One of its signature physical attributes was the scored surface finish on the unpainted side of the vessel (Figure 1a). Some researchers have also noted the existence of the Smooth Variety of Chupadero Black-on-white, this has become a useful tool to distinguishing its possible functionality values, cultural signatures, and its geographic occurrences (Mera 1931, Wiseman 1986, and Clark 2006). There is another, lesser-known variant of Chupadero B/W which is typical for coiled texture on the exteriors of painted bowls (Figure 1b). It seems that archaeologists' encounter with this variant has been sporadic, at best, even for those who have worked for decades in the region. This has left little opportunity to provide a better understanding of this ceramic type variant.

In recent years, the Office of Contract Archeology, University of New Mexico (OCA/UNM) performed a series of archaeological site evaluations and data recovery projects in various parts of White Sands Missile Range (WSMR). These investigations have resulted into generating ample datasets that have allowed me to provide initial observations about the illusive Chupadero subtype. In this article, I am presenting a Coiled Variety of Chupadero Black-on-white and providing a description of its main physical attributes, as well as, its lesser-known, geographic distribution.

Research indicates that the Coiled Variety of Chupadero Black-on-white has been only known on bowls where the interior is painted black-on-white while the exterior has one or several flattened clay coils. As part of its introduction, I am presenting all, currently available, ceramic attributes of this type. I am also presenting an outline of its general placement within a greater population of southwestern painted bowls (and some jars) with corrugated, coiled or basket-impressed exterior.

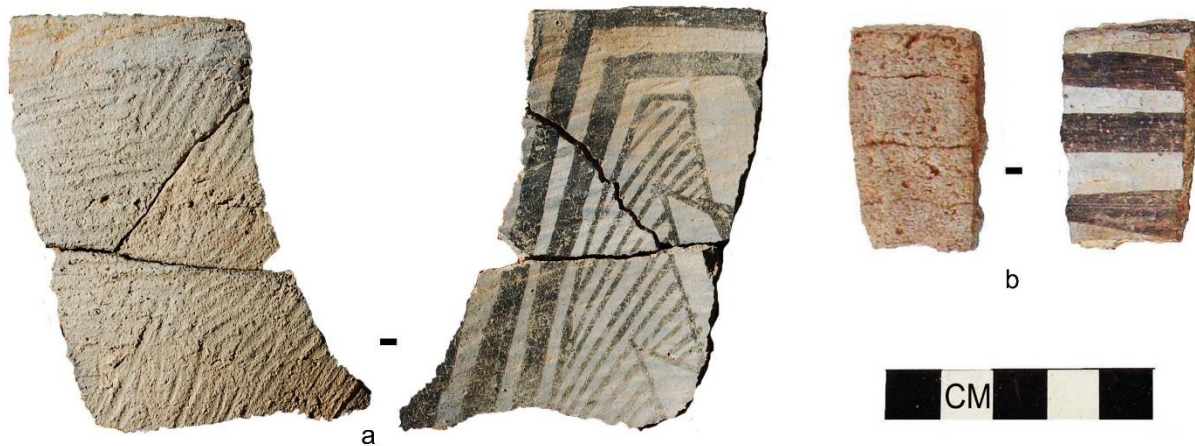


Figure 1. Examples of Chupadero Black-on-white bowls with scored (a) and coiled exterior (b).

Background Information

Chupadero Black-on-white with coiled exterior has been observed by numerous researchers working in southern New Mexico (Mera 1931, Kelley 1984, Meade Kemrer, Toni Sudar Laumbach, Myles Miller, Marc Sale, Christine Van Pool, Regge Wiseman - email communication in August 2016). While, it is possible the occurrence of the coiled variant of Chupadero Black-on-white could be merely incidental, ceramics in general have the ability to provide discrete signatures of minute differences within southwestern cultural groups. This occurrence could also be the case of the Coiled Variant of Chupadero B/W in the Jornada Mogollon and Casas Grandes regions where Chupadero commonly occurs.

The earliest descriptions of Chupadero B/W date back into the 1930s. Mera 1931 and Kidder and Shepard 1936 describe diagnostic attributes of Chupadero Black-on-white as bowls having flat, disc-like bases. Indeed, Wiseman (1986) postulated that virtually all Chupadero vessels were made with the disk base. Yet, Clark argues that besides the use of “pancake” base, the second type of base forming was the coil-and-scrape technique (2006:248-9). In fact, her analysis of Chupadero vessels from central New Mexico area revealed that about 64% of vessels from the Salinas region were built with a prepared base. By contrast, up to 70% of vessels from the Sierra Blanca region were built with the coil-and-scrape technique (Clark 2006:249, Table 8.6).

Mera (1931) outlined that the jars typically have flared rims and their handles are made of two to three conjoined clay coils. I would point out that I have documented several Chupadero jar handles that consisted of only a single, more robust clay coil. The bowls are almost always deep containers with direct, or sometimes flared rims.

Rough scoring is present on the interior surfaces of jars and other small-mouthed vessels, and the exteriors of bowls. The paint used on Chupadero Black-on-white vessels is usually rusty black.

Two major production locales of Chupadero Black-on-white include (1) major pueblos of the Salinas region and (2) cluster of village sites in the Sierra Blanca region. The results of Neutron Activation Analysis of sampled sherds from both regions revealed that, with a few exceptions, most sherds found in the Tularosa Basin come from the Sierra Blanca manufacturing centers (Clark 2006:190).

Way before this introduction of Coiled Variant, Mera (1935) noted a smooth version of Chupadero Black-on-white which he tentatively called Casa Colorado Black-on-white, although, the type was not given a formal introduction to the archaeological community. Later, Wiseman (1986) formally described its smooth (unscored) variant. Interestingly, the smooth variant appears to have slightly different design elements that tend to indicate Ancestral Pueblo association. By contrast, the “regular” (scored) variant showed designs more like those of the Mogollon (Wiseman 1986:46).

Wiseman (1986) argues that the shift from scored to smooth Chupadero B/W happened after the Pueblo III period of the Ancestral Pueblo sequence. This conforms well with the occurrence of Chupadero sherds with coiled exterior at West Dry Lake Pueblo. Despite the fact the sherds came from surface contexts, most of the site area appears to be associated with El Paso phase occupations.

Other Painted Southwestern Ceramics with Corrugated Exterior on Bowls

For a better understanding the placement of Chupadero Black-on-white Coiled Variant in the context of southwestern ceramics, I am presenting the results of my literature search of other documented pottery types with similar texture-and-paint combinations. It is because, on the one hand, each southwestern Pueblo tribe has had its specific attributes own to its culture, however, on the other hand, these pueblos share numerous characteristics with minor differences. In the context of southwestern pottery, Colton (1943:316) called it the “Principal of Analogous Pottery Types” which explains why neighboring tribes would have manufactured similar pottery during the same period, yet with minor differences from each other. This notion is further explored in the following discussion.

A number of ceramic types with corrugated exterior texture was produced over a span of more than six centuries in the Southwest. Already in the late 19th century Cushing (1886:498) noted that the early painted bowls in the Zuni area were made with corrugated exterior. The author explained that the reason for this was purely a practical one. Cushing continues explaining that prehistoric Zuni shallow bowls with corrugated exteriors were formed by merging clay coils over the exterior surface of an upside-down inverted basket. Then, before the bowls were fired, their interiors were painted in black-on-white designs. It is not clear, from Cushing’s report, how many such vessels have been recovered during his work in the Zuni region.

There is a number of regions, with southwestern ceramic traditions, where painted bowls with corrugated exteriors were made. In the Four Corners Area, they include Mesa Verde Whiteware, Tusayan Whiteware, Jeddito Yellow Ware and Desert Grayware further west in the

Fremont region. In the northwestern and north-central New Mexico, the traditions include Cibola Whiteware, Rio Grande Whiteware, and Rio Grande Glazeware. In the eastern Arizona – western New Mexico border region, the traditions include White Mountain Redware, Mogollon Brownware, Salado Redware, and Tusayan Whiteware. And, finally, in the southern New Mexico – northern Chihuahua region, the traditions include Chihuahuan Polychromes Three Rivers Terracottaware, and Chupadero Whiteware. Representative ceramic types for the above-mentioned ceramic traditions are summed in Tables 1 and 2 and are also briefly discussed below.

Importantly, not all the painted bowls have the same type of corrugated exterior. In fact, my literature search has produced at least six different corrugation veneers including (1) basket-impressed, (2) corrugated, (3) clapboard corrugated, (4) obliterated corrugated, (5) indented corrugated, (6) round coils, and finally (7) flattened coils and (8) single flattened rim coil (also called folded rim) (Table 1, Figure 2).

The first corrugated type, (plain) corrugated is represented in the largest number of ceramic types (n = 10). Ceramic types listed in this group all came from the Four Corners and the Arizona – New Mexico border regions and are largely painted in black-on-white, black-on-yellow or in polychrome setting. Cortez B/W is the common type with some corrugations on painted bowl exteriors.

The second most common group of painted bowl types with corrugated exterior is indented corrugated. This exterior texture was found on nine different ceramic types. It should be noted, however, that five out of nine different ceramic types are actually painted on their exterior corrugated surfaces. Except for Mata Red-on-brown (which is a Chihuahuan Polychrome), all others are Salado Redwares. Of the five types with painted corrugated exteriors, Mata R/Br and Salado White-on-red, are predominantly, or exclusively, jar forms. The four painted bowl types with indented corrugated exteriors are Puerco B/W, Showlow B/R, Tusayan B/W, and Jeddito B/Y, and again, originate primarily from the Four Corners area.

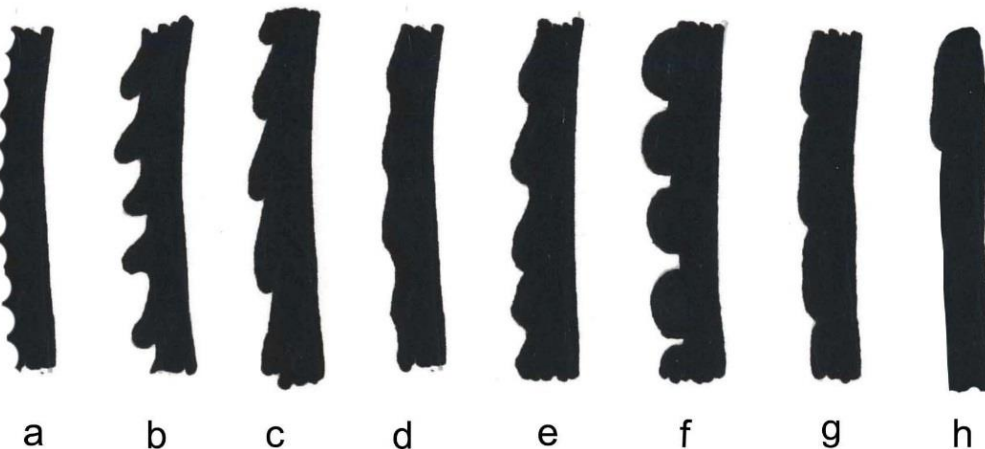


Figure 2. Variation in southwestern textured painted bowl exteriors: (a) basket-impressed; (b) plain corrugated; (c) clapboard corrugated; (d) obliterated corrugated; (e) indented corrugated; (f) round coils; (g) flattened coils, (h) single flattened coil (folded rim).

The third and fourth types of corrugations include Obliterated corrugated and flattened corrugated, both of which are represented by several different ceramic types. Similar to the indented corrugated, the obliterated corrugated texture is found on three types with paint present on the exterior texture. They include Dublan Polychrome and Medanos Polychrome, both of which are Chihuahuan polychromes manufactured primarily as jars. The third type of this group is Cibecue Painted Polychrome manufactured both as jars and bowls.

The fourth corrugated group is flattened coils which typically appear as flat or undulated bands stacked on top of each other. This type of corrugation was found almost exclusively on Jornada Mogollon ceramics including Lincoln Black-on-red, Three Rivers Red-on-terracotta and Chupadero Black-on-white.

The fifth corrugated group includes rounded coils and has thus far been documented on two Rio Grande Glazeware types. The exact names of both types are unknown as these sherds have only been preserved by small body sherds. Their general reference names are Glaze A red and Glaze A yellow and came from two sites in Albuquerque. These two ceramics came from two Classic period Ancestral Pueblo sites in Albuquerque; one of them is the Chamisal Site, LA 22765 and the other is the Alameda School Site, LA 421.

Finally, the last corrugated group is clapboard corrugated and has been observed on Burnham Black-on-white and Agua Fria Glaze-on-red.

Table 1.

Variations of textured surfaces on painted southwestern ceramics
(Note: Types marked with * are jars, all others are bowls or ladles).

Location of Painted Design	Basket-Imprinted	Plain Corrugated	Clapboard Corrugated	Indented Corrugated	Obliterated Indented Corr.	Round Coils	Flattened Coils	Folded Rim	
Polished Interior	1. Dolores Basket-Imprinted 2. Mancos B/W 3. Santa Fe B/W 4. Taos B/W	1. Shato B/W 2. Chevelon B/W 3. Chuska B/W 4. Walnut B/W 5. Mancos B/W 6. Cortez B/W 7. McElmo B/W 8. Showlow B/R Corr. 9. Pinedale B/W 10. Cibecue Poly 11. Jeddito Poly	1. Burnham B/W 2. Agua Fria G/R	1. Puerco B/R 2. Showlow B/R Corr 3. Mancos B/W. 4. Tusayan B/W 5. Chuska B/W 6. Nava B/W 7. Jeddito B/Y		1. Paragonah Coiled 2. Glaze A red 3. Glaze A yellow	1. Cortez B/W 2. Lincoln B/R 3. Three Rivers R/T 4. Chupadero B/W`	1. Mummy Lake Gray 2. McElmo B/W 3. Chupadero B/W	
	Corr. Exterior		12. McDonald Painted Corr.	3. McDonald Painted Corr.	8. Tularosa W/R 9. McElma-Mesa Verde B/W* 10. McDonald Painted Corr. 11. Cibecue Ptd Corr. 12. Saladao W/R* 13. Mata R/Br Textured*	1. Cibecue Painted Poly* 2. Dublin Poly* 3. Medanos Poly*			4. Papago R/Br 5. Pima B/R

The review of the painted ceramic types with textured exteriors indicates that the types of corrugations were preferred by different cultural groups. For example, corrugated texture was preferred in the Four Corners region and the Arizona-New Mexico border area. The flattened coils were almost exclusively made by the Jornada Mogollon potters; the indented corrugated and obliterated corrugated textures were made by the Casas Grandes and Salado groups, and, finally, preference for the clapboard corrugated and round coils textures were made by the Rio Grande potters.

Equally interesting is an observation of the parallels in the development of the painted corrugated vessels throughout the southwest. The data indicates that the earliest such types were manufactured during the Pueblo I and II periods and most such corrugated types come from Chuska, Mesa Verde, Little Colorado, Tusayan, Cibola, Fremont and even Paquimè areas. The manufacture of the occasional texture-and-paint vessels continued into the Pueblo III and IV periods in most of the above mentioned regions but also first appeared in the various parts of the Mogollon territory. For example we see first such examples within the White Mountain Redwares, Salado Redwares as well as the Rio Grande Glazewares. As one would expect, there is a marked shift in manufacturing plain corrugated to indented corrugated and ultimately obliterated indented corrugated exterior texture on vessels made between Pueblo II and Pueblo IV periods. With its exterior flattened coils, Chupadero B/W Coiled Variant and the Jornada Mogollon ceramic tradition (also including Three Rivers Red-on-terracotta and Lincoln Black-on-red) have this rare type of texture (see Tables 1 and 2).

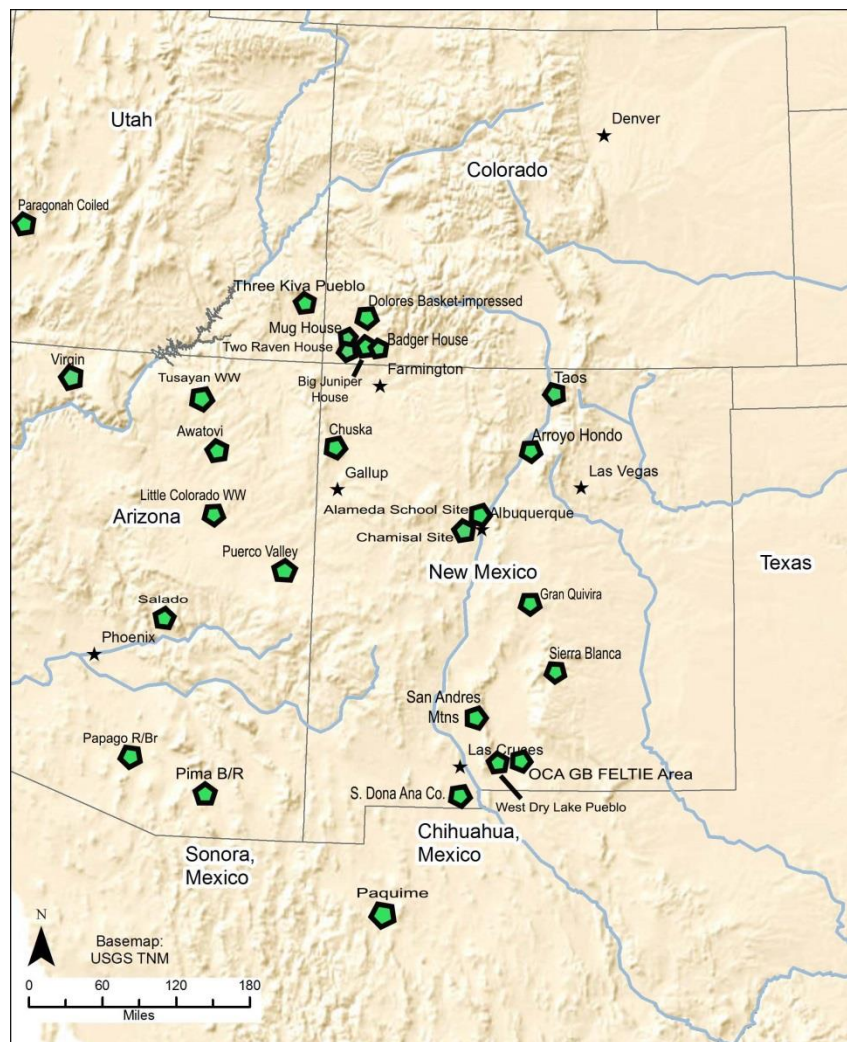


Figure 3. Map showing portion of the southwest with general or discrete locations of painted ceramic types with textured exteriors.

Table 2.
Textured ceramic wares by site, style, and period.

Area	Ceramic Tradition	Site-Location	Corrugation Style	Pueblo I Period	Pueblo II, Period	Pueblo III Period	Pueblo IV Period	Historic	Reference
Fremont	Desert Grayware	Snake Valley, Utah	Round coils?	--	Paragon Coiled	--	--	--	Madsen 1977
Ancestral Pueblo (Virgin)	Shinarump WW	NDA	NDA	--	B/W	--	--	--	Colton 1943
	Moapa GW	NDA	NDA	--	B/W	--	--	--	Colton 1943
Ancestral Pueblo (Mesa Verde)	Mesa Verde GW.	NDA	Basket-impressed	--	Dolores Basket-impr.	--	--	--	Miller 1974
	Mesa Verde GW	Three Kiva Pueblo, Montez., UT	Applique ridge	--	Mancos Corr. Var. II	--	--	--	Miller 1974
	Mesa Verde GW	Big Juniper House	Folded Rim	--	Mummy Lake Gray		--	--	Rohn and Swannack 1965
	Mesa Verde Whiteware	Big Juniper H. Badger House	Corrugated, Flattened coils	--	Cortez B/W	--	--	--	Swannack 1969; Hayes and Lancaster 1975
	Mesa Verde Whiteware	-Big Juniper House -Badger House -Two Raven House	-Coiled Basket Impressed -Zone Corr. -Ind. Corr. -Corrugated -Folded Rim	--	Mancos B/W		--	--	Swannack 1969; Hayes and Lancaster 1975
	Mesa Verde Whiteware	Big Juniper H. Badger House	Corrugated ?? Folded rim	--	--	McElmo B/W	--	--	Swannack 1969; Hayes and Lancaster 1975
	Mesa Verde Whiteware	Mug House	Ind. Corr.	--	--	McElmo -Mesa Verde B/W	--	--	Rohn 1971
Ancestral P. Little Colorado	Little Colorado WW	NA 3218-McDonald Canyon	Corrugated	--	Chevelon B/W	--	--	--	Colton 1955
	Little Colorado WW	Two Kivas Pueblo	Corrugated	--	--	Walnut B/W	--	--	Colton 1955
Ancestral P. RW	White Mtn. RW	Data Not Available	Indented corr.	--	--	Puerco B/R	--	--	Carlson 1970,

Area	Ceramic Tradition	Site-Location	Corrugation Style	Pueblo I Period	Pueblo II, Period	Pueblo III Period	Pueblo IV Period	Historic	Reference
	White Mtn. Redware	Puerco Valley	-Corrugated -Indented Corr.	--	--	Showlow B/R Corr.	--	--	Hays Gilpin and van Hartesveldt 1995
	White Mtn. RW	NDA	NDA	--	--	Wingate Corr.	--	--	David Snow, personal communication
	White Mtn. RW	NDA	Corrugated, Obliter. corr.	--	--	Cibecue Painted Polychrome		--	Colton and Hargrave 1937
Ancestral Pueblo -Chuska	Chuska WW, Carbon Paint	NDA	Clapboard Corr.	Burnham B/W	--	--	--	--	Peckham 1989
	Chuska WW, Carbon Paint	NDA	Corr., Ind. Corr.	--	Chuska B/W	--	--	--	Peckham 1989
	Chuska WW, Carbon Paint	NDA	NDA	--	--	Nava B/W	--	--	Peckham 1989
Mogollon	Salado Redware	NDA	Corrugated, Indented Corr. Clapboard Cor.	--	--	McDonald Painted Corrugated		--	Colton and Hargrave 1937, Martin et al. 1964 Gifford 1957
	Salado Redware	NDA	Obliterated Corr.	--	--	Salado W/R	--	--	Colton and Hargrave 1937
	Mogollon Brownware	NDA	Corr., Ind. Corr. bands below rim	--	--	Tularosa W/R	--	--	Martin et al. 1964
Ancestral Pueblo (Hopi)	Tusayan WW (Virgin)	NDA	NDA	--	Hurricane Corr.	--	--	--	Colton 1943
	Tusayan WW (Kayenta)	NA 295- Elephants Feet	Corrugated	--	Shato B/W	--	--	--	Colton 1943, 1955
	Tusayan WW	Awatovi Ruins	Indented Corr.	--	--	Tusayan B/W	--	--	Smith 1971
	Jeddito YW	Awatovi Ruins	Indented Corr.	--	--	Jeddito B/O	--	--	Smith 1971
	Jeddito YW	Awatovi Ruins	Corrugated	--	--	Jeddito Poly	--	--	Smith 1971
Eastern Pueblo	Cibola WW	Tonto Creek, AZ	Ind. Corr.	--	Snowflake B/W	--	--	--	Herr 2000
	Cibola WW	NDA	Corrugated	--	--	Pinedale B/W		--	www.rarepottery.info
	Rio Grande WW	Taos Pueblo	Basket-impressed	--	--	Taos B/W		--	Herold and Luebben 1968

Area	Ceramic Tradition	Site-Location	Corrugation Style	Pueblo I Period	Pueblo II, Period	Pueblo III Period	Pueblo IV Period	Historic	Reference
	Rio Grande WW	Arroyo Hondo P.	Basket Impressed	--	--	Santa Fe B/W		--	Habicht-Mauche et al. 1993
	Rio Grande Glazeware	Chamisal Site, ABQ	Clapboard Corr.	--	--	--	Glaze A red	--	Kurota 2013a
	Rio Grande Glazeware	Chamisal Site, ABQ	Round Coils	--	--	--	Glaze A red	--	Kurota 2013a
	Rio Grande Glazeware	Alameda School Site, Albuquerque	Round Coils	--	--	--	Glaze A yellow	--	Kurota 2013b
Casas Grandes	Chihuahuan Polychromes	Paquime	Indented Corr.	--	--	Mata R/Br Textured	--	--	Rakita and Raymond 2003
	Chihuahuan Polychromes	Paquime	Obliterated Ind. Corr.	--	--	--	Dublan Poly	--	Rakita and Raymond 2003
	Chihuahuan Polychromes	Paquime	Obliterated Ind. Corr.	--	--	--	Medanos Poly	--	Rakita and Raymond
Jornada Mogollon	3 Rivers Terr. W	Tularosa Basin	Flattened Coils	--	--	--	3 Rivers R/T	--	Kelley 1984
	3 Rivers Terr. W.	NDA	Flattened Coils	--	--	--	Lincoln B/R	--	Kelley 1984
	Chupadero Whiteware	West Dry Lake Pueblo, Tularosa Basin, NM	Flattened Coils Folded Rim	--	--	--	Chupadero B/W Coiled	--	-Kidder and Shepard 1936 -Habicht-Mauche et al. 1993 -Hayes et al. 1981
O'Odham	Hist. Tohono O'Odham	Southern Arizona	Folded Rim	--	--	--	--	Papago R/Br	Fontana et al. 1962
	Historic Akimel O'Odham	Southern Arizona	Folded Rim	--	--	--	--	Pima B/R	Fontana et al. 1962

NDA-No Data Available

Analysis Methods

All information about Chupadero Black-on-white Coiled Variant comes from the observations made in the field on surface specimens. They come from three archaeological sites all of which are located on White Sands Missile Range in the southern Tularosa Basin. All three sites date to the El Paso phase of the Jornada Mogollon affinity.

In-field conditions only provided general data collection, such as naked eye observations of paste, slip, and paint color, although, in some cases, a hand-held magnification lens was used.

All descriptions of ceramic attributes come from rim and body sherds as no complete bowls were available for the analysis.

Chupadero Black-on-white Coiled Variety

Chupadero Black-on-white Coiled Variety is occasionally found throughout the region of southcentral New Mexico. Through my literature search and my email communication with scholars who have worked extensively in south-central New Mexico, I was able to collect information on the general distribution of Chupadero B/W sherds with coiled exterior. The Variety can be found primarily within the limits of the Tularosa Basin and Hueco Bolson. Its northern reach can be traced at least to the Gran Quivira ruins and to the east in the Sierra Blanca region. Interestingly, while Clark's (2006) analysis of Chupadero B/W sherds from the Salinas and Sierra Blanca regions does not mention any occurrences of unobliterated coils left on the exterior of bowls, Hayes and colleagues (1981:67) noted a variant in which a portion of the ceramic coils near the rim was not obliterated during production. This observation could indicate that only a small number of potters may have practiced this type of exterior surface finish. In the Sierra Blanca region, Kelley (1984:143) called these partially unobliterated coils as "bands" or "slabs". She found them to be occasionally present on Chupadero B/W, Three Rivers Red-on-terracotta, and Lincoln Black-on-red.

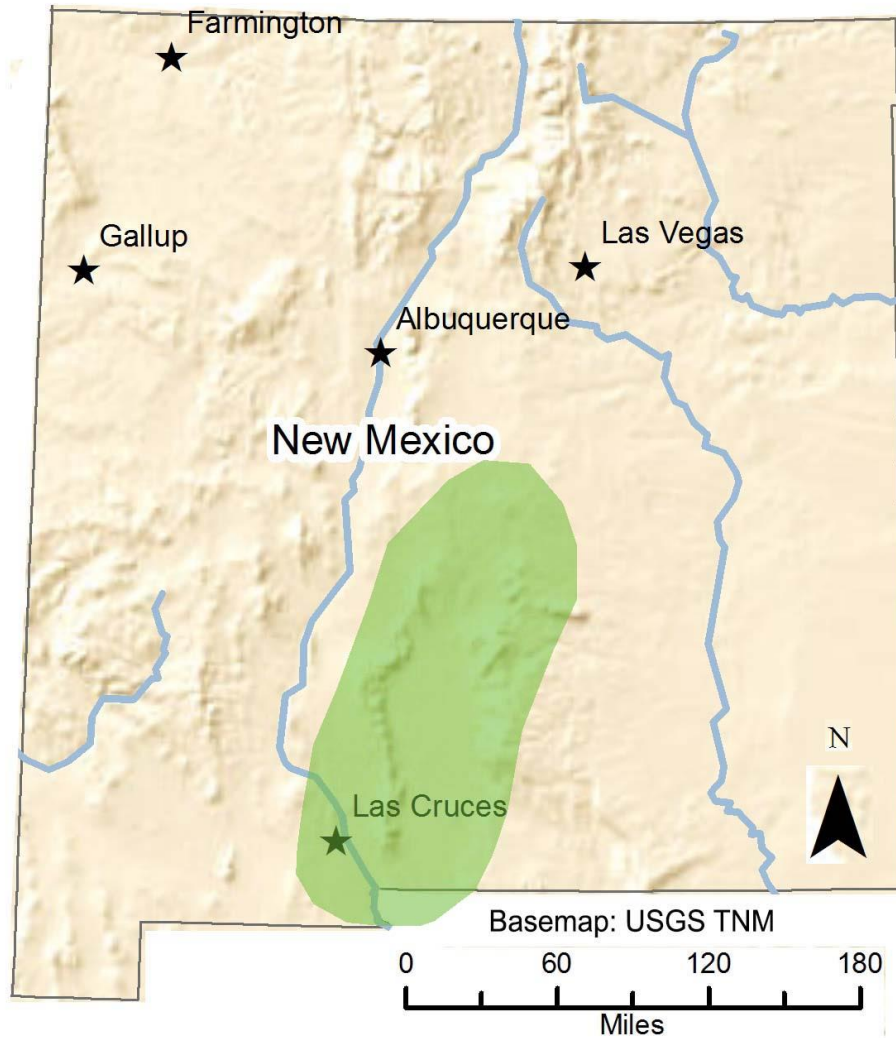


Figure 4. Map of New Mexico with highlighted area indicating occurrence of Chupadero Black-on-white Coiled Variety

Description of Ceramic Attributes

Sixteen bowl rim and body sherds are used here to provide initial dataset of attributes of Coiled Variant of Chupadero B/W. They come from three sites all being located in the southern portion of White Sands Missile Range. Three sherds (Figure 5i, j, and m) come from LA 165433, one sherd (Figure 5p) comes from OCA's GB FELTIE site with field number 52 and the rest come from West Dry Lake Pueblo, LA 104864. I would also point out that the three sherds from LA165433 came from a concentration of perhaps 15 bowl sherds and altogether may have come from a single vessel. By contrast, all sherds from West Dry Lake Pueblo likely represent unique ceramic containers as they all were found several hundred meters apart from each other. Data collected from these sherds can serve as a foundation about what is known regarding this illusive type variant with the expectations of more information to be collected by other researchers in the future.

Coiled Variant of Chupadero B/W has almost all attributes the same, or very similar, to that of the typical scored version. These physical features are described in the following section and are also supplemented with visual presentation of selected specimens in Figure 5.

Vessel Form: All bowls appear to be deep containers with direct upright rims

Vessel Wall Thickness: Similar to the vessels with scored or smooth exteriors. Ranges from 5 to 6 mm.

Paste: The paste is the same as that on the scored or smooth variety and includes white, brownish gray to light or dark gray color.

Temper: Same as in scored or smooth variant and includes crushed sherd often mixed with feldspars and quartz, sometimes also caliche and tabular clay pellets.

Surface Finish: The interior surface finish is indistinguishable from that on scored or smoothed varieties typically occurring as well smoothed or lightly or well polished. The exterior surface finish is the main distinguishing factor of this variant. Several parallel horizontal bands can be found stacked on top of each other. The bands range from 10 to 22 mm wide. In most cases, the corrugation coils were flattened to the degree that there is hardly any relief recognizable in cross-sectional view. The widest bands are typically present at the rim top. The rim coils commonly stand out from the rest of the coils for their somewhat exuberant manufacture. They also often appear sloppy with their terminal portion gradually merging into the vessel wall at a diagonal angle (instead of horizontal see Figure 11).

In some cases, only the rim coil is discernable on the exterior wall with the remaining coils being smoothed over. This could be considered a sub-variant within Chupadero B/W Coiled. At present, I have observed only two or perhaps three such specimens although, if more are found in the future, perhaps this could be termed as another variant (such as Chupadero Black-on-white Folded Rim Variant). Admittedly it is inconclusive how many Folded Rim variants are present in the assemblage shown in Figure 1 as most of these sherds are too small. Furthermore, several of the rim and body sherds are broken in the area of juncture between individual coils which often leaves it inconclusive so as how many coils were presented below the broken section.

Slip: Thirty years ago, Wiseman (1986) pointed out that observations of Chupadero slips can be tricky and should be performed using a binocular microscope. This is because the slip is often hard to distinguish from the surface of Chupadero bowls and jars. This also appears to be the case of the coiled variant. While some sherds clearly indicate the presence of slip on the painted bowl interiors, OCA recently documented site LA 165433 where 12 sherds with coiled exterior probably came from a single bowl. These sherds were slipped even on the coiled exterior (Figure 5i, j, m)

Paint: Mineral, in one instance the paint had a glaze-like appearance (Figure 5o).

Painted Decoration: Given the limitations of the data using the rim and body sherds, currently it is inconclusive about the overall interior bowl design layouts but it appears to be the same as that of the scored Chupadero B/W. Nevertheless, the available ceramic sherds indicate two major design groups, one that consists almost exclusively of solid elements and the other of alternating solid and hachured elements. The first group includes medium (about 4 to 6 mm wide) to broad (about 7 to 12 mm wide) solid lines and solid triangles. These lines appear as parallel layouts either in horizontal or diagonal position. The second design group is the same as that found on scored or smooth variants with solid and hachured triangles typically touching with tips. The one sherd with glaze-like paint had a cross-hatch design just below the rim. Some of the design elements found on the smooth or scored Chupadero sherds (such as the dots, checkerboards, or curvilinear scrolls) so far have not been encountered in the coiled variant assemblage. At this time it is not clear if this observation is merely a product of too small of the documented assemblage or if it bares certain cultural meaning.

Type Site: West Dry Lake Pueblo (LA 104864) is located near the West Dry Lake Playa in southern Tularosa Basin. At least 11 specimens of the type variant were found at West Dry Lake Pueblo although there is little evidence the bowls were manufactured at the site but, instead, were traded in. No complete vessels are known to exist.

Period of Manufacture: Primarily El Paso phase, Jornada Mogollon, AD 1250-1450 based on cross-dating with surface associations of other painted ceramic types (including El Paso Polychrome, Three Rivers Red-on-terracotta, Lincoln Black-on-red, Magdalena Black-on-white, Seco Corrugated, Playas Red Incised, and various Chihuahuan Polychromes).

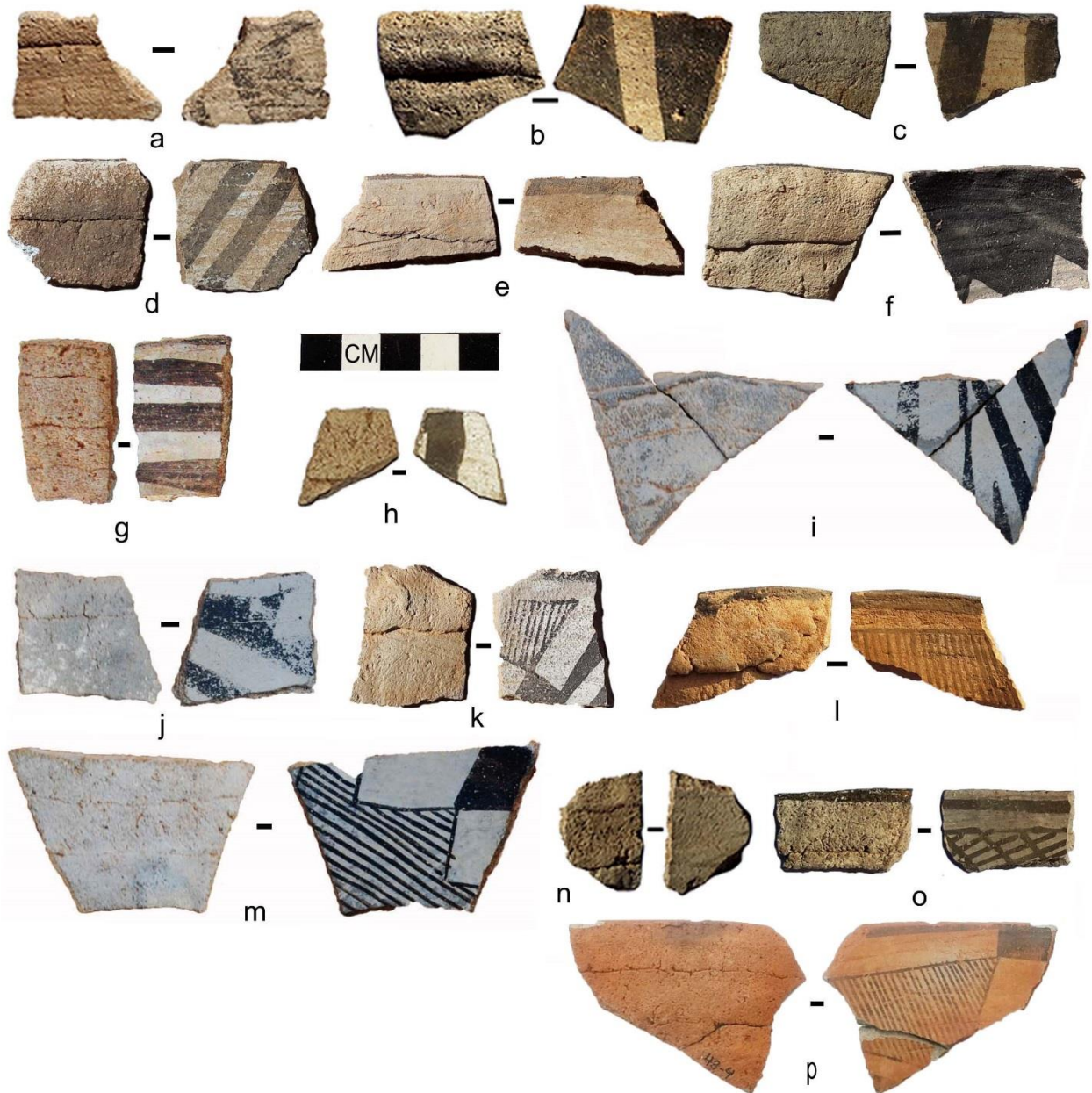


Figure 5. Examples of Chupadero Black-on-white Coiled Variety: examples of single rim coil (folded rim) (a, c, d, and k); examples of multiple flattened coils (g, j, m, n, and p). All others are too small to be separated into either category.

Discussion

The Coiled Chupadero has been described here on a small group of sherds located in southern Tularosa Basin although others have noted it present in the Salinas and Sierra Blanca regions to the north and the Cottonwood Springs area to the west and in southern Doña Ana County. The exterior coils are sometimes well recognizable while in other cases they are barely

visible to the naked eye (for example Figure 5p). In the future this may result into a situation when it would be up to a researcher to decide whether a bowl with poorly visible exterior coils could be assigned the coiled variant name. In my opinion, if the coils are visible, even in the slightest way, the ceramic should be referred to as Chupadero B/W Coiled Variety. The reason is the exterior was not rubbed enough to create the smooth variety and neither was it brushed and scratched to produce the scored effect. Such an approach will aid in our better understanding of the full distribution and to a more refined definition of the Coiled Chupadero.

Future field projects should also clarify whether the production and distribution through trade of the Coiled Variety was more restricted to the southcentral part of New Mexico. Having this in mind, more fieldwork and analyses are needed to evaluate whether the coiled variety was also painted with dots, checkerboards, and curvilinear scrolls.

The exact purpose of the coiled exteriors on the various Southwestern ceramic types remains unknown. Several possible explanations could be suggested. For example, the bowls may have served special purpose in daily lives of the Jornada Mogollon. This alternative is less likely though as the haphazardly-made coils do not appear to add an aesthetic value to the bowls which would be expected from special-purpose vessels (such as those used in ceremonies or feasting). Furthermore, Clark (2006:275) concluded that Chupadero B/W bowls in general were not made into large-diameter vessels that would be expected for events such as feasting.

It is possible the coiled exteriors on bowls may be merely accidental as potters may have forgotten to smooth out or score these surfaces. Alternatively, it is possible that sometimes a potter may have ran out of time to smooth out the exterior coils on some of the bowls before the unfired clay container completely dried out and it was no longer possible to properly smooth out or score its exterior surface.

One could also suggest the coiled texture was made purposefully to improve a vessel's chances to withstand the heat shock during the ceramic firing or food cooking process. Studies have demonstrated the superior qualities of textured surfaces of ceramic containers used for cooking (Pierce 2005). Furthermore, vessels with basal corrugations have also demonstrated extended vessel use life (Pierce 2005). Hence, it could be argued that the coiled exteriors on painted bowls indicate their possible cooking function. Unfortunately, limited data is available on the presence or absence of soot on the coiled variant which precludes providing support to this interpretation.

Another explanation for the "need" of coiled (or corrugated for that matter) exterior on bowls was heating effectiveness. Studies have demonstrated that corrugated or otherwise textured vessels transfer heat into foodstuffs better than vessels with smooth surfaces (Schiffer 1990, Müller et al. 2013). Yet, experimental research revealed little or no advantage of corrugated surfaces having faster heating rate than those with smooth surfaces (Young and Stone 1990).

Finally, a possible purpose for coiled bowl exteriors needs to be considered an attempt to increase the gripability of the corrugated exteriors of bowls. Boulanger and Hudson (2012:300) argue that vessels with corrugated surfaces increase the amount of friction which, in turn, improves their gripability. One could argue that such function could have been desired if some of the painted Chupadero B/W bowls had a higher economic or perhaps spiritual significance. At the same time, it is questionable so as to what degree the gripability of bowls with coiled exterior would have been increased as scored relief may have offered similar friction characteristics. I would argue that at least the bowls with more pronounced folded rims likely would have offered better gripability. Furthermore, the folded-rim bowls also likely would have better resisted the impact shock after being dropped to the ground. This impact resistance has also been suggested for Papago red-on-brown and Pima Black-on-red vessels with folded rims (Kurota et al. 2002).

Hays and colleagues (1981:67) discuss the occurrence of coiled Chupadero B/W bowls at Gran Quivira's Mound 7. Like in many other studies of ceramic assemblages that included Chupadero bowls, the authors do not seem to pay much attention to the presence of unobliterated exterior coils but, rather, refer to these specimens as unscored vessels where the pottery was not subject to the application of the scoring finishing technique. This supports the argument that the coiled exterior of some Chupadero B/W bowls was an accident where the potter may have ran out of time to apply the final finishing technique on a rapidly drying unfired vessel.

Clark's analysis of vessels from the Salinas and Sierra Blanca regions revealed high diversity in finishing techniques on high visibility surfaces of vessels (such as the exterior of deep bowls). These data made the author conclude that the high level of diversity in finishing techniques "suggests that potters had some degree of choice in how they finished and decorated their vessels" (Clark 2006:269). Yet, it is interesting that there is little difference that could be identified in the painted decoration styles between the Salinas and Sierra Blanca regions (Clark 2006:273).

The high diversity of surface treatment on high-visibility vessel surfaces indicates possible differences between potters in how they manufactured Chupadero pottery. This supports the argument that flattened coils or folded rims left on some exteriors of painted bowls could be reflecting personal choices made by individual potters. Furthermore, the lack of diversity in painted designs on the pottery from the two manufacturing centers even more highlights the importance of documenting the presence of Coiled Variety of Chupadero Black-on-white.

Summary

In this paper I have offered a formal introduction of the Coiled Variety of Chupadero Black-on-white. Literature overview indicates numerous other southwestern painted ceramics with corrugated and coiled exterior were made from the 9th to the 15th century. The earliest corrugated exteriors in the Southwest were made mostly in plain corrugated and later indented corrugated form, which correspond with Pueblo II and Pueblo III periods respectively. During the Pueblo IV period, additional textured finishes were used including obliterated indented corrugated, round coils, clapboard corrugated, and flattened coils.

Although the current data sets for this paper were limited, some patterns about the type can be observed. For example, the textured exterior was made either as a single coil at the rim top producing the folded rim appearance, or the entire exterior of the vessel was coiled.

Possible reasons for textured exteriors on some of the painted southwestern ceramics include: (1) special (ceremonial) meaning; (2) product of accident or lack of time to “properly” finish the exterior; (3) purposefully to improve the vessels heat stress resistance qualities during the cooking process, (4) to improve gripability of bowl’s exterior to prevent vessel dropping, and (5) to decrease vessel breakage with the introduction of folded rims.

Aside from Cortez B/W of Mesa Verde Whiteware, Jornada Mogollon painted bowls (including Three Rivers Red-on-terracotta, Lincoln Black-on-red, and Chupadero Black-on-white) belong to an exclusive ceramic tradition with exterior flattened coils. Interestingly, the historic Tohono O’Odham and Pimas made many of their painted vessels with folded rims. This bakes the question whether there was a connection between the Jornada Mogollon and the subsequent historic O’Odham and Pima folded rim vessels. Yet, folded rims on historic southern Arizona pottery are believed to be a trait borrowed from the Spanish metal containers with similar rim finish.

LA 104864 (the West Dry Lake Pueblo) is proposed to be the type site for the Coiled Variety with at least 11 separate sherds documented on the site surface despite the fact that Chupadero B/W Coiled Variety was probably not produced at this locale. My literature search and consulting colleagues with strong experience in southern New Mexico suggests the Variant tends to occur primarily in the south-central New Mexico, spanning from Gran Quivira and Sierra Blanca areas to the north, southern Doña Ana and Otero counties to the south, the Sacramento Mountains to the east, and the Rio Grande to the west. Future data collection on Coiled Chupadero sherds should be able to better refine its geographical limits.

Acknowledgments

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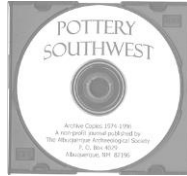
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