POTTERY SOUTHWEST

Volume 33, No. 3 SEPTEMBER 2017
FALL 2017 ISSN 0738-8020

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.

CONTENTS

Pottery Southwest is a non-profit journal of the Albuquerque Archaeological Society

Lincoln Black-on-Red, a Late Prehistoric Pottery from the Northern Sierra Blanca Region in New Mexico with a Report on Petrography by David V. Hill, Ph.D.

Regge N. Wiseman, Emeritus and Research Associate
Office of Archaeological Studies
Center for New Mexico Archaeology, Santa Fe

Introduction

H.P. Mera and W.S. Stallings, Jr., of the Laboratory of Anthropology, Inc., first described Lincoln Black-on-red (Lincoln B/r) in 1931. That bulletin has since been reprinted in its original form and provided with a short update (Wiseman in Brown et al. 2014). Lincoln B/r is well known to researchers in the Sierra Blanca region of south-central New Mexico but because it was not traded widely in prehistoric times, nor made in particularly large numbers even in its homeland, the type remains a mystery to most archaeologists. The Sierra Blanca region includes northern Otero and all of Lincoln counties. Lincoln B/r is a major attribute of Jane Kelley's Lincoln phase in Lincoln County, which dates perhaps as early as A.D. 1250/1300 and lasts until about 1400. The present paper presents the results of a recent in-depth study of Lincoln B/r from certain excavated sites in the northern Sierra Blanca region.

Lincoln B/r is the terminal type of a sequence of types known in some quarters as the Three Rivers Redware series. The series ultimately derived from Jornada Brown, a plain, undecorated type that initially developed from another plain brown type, Alma Plain (Mera 1943; Mera and Stallings 1931; Jennings 1940). Alma was the earliest pottery made by the Mogollon peoples of southwestern New Mexico. Jornada Brown appears to have first been made in the early A.D. 500s in the Sierra Blanca region (Campbell and Railey 2008). The Three Rivers Redware series developed from Jornada Brown and includes Jornada Red, Broadline Red-on-terracotta (R/t), San Andres R/t, Three Rivers R/t, and finally, Lincoln B/r. Mera and Stallings (1931) also add a final type called Lincoln Glaze-on-Red, a variant that the present author considers to be dubious at best. The reasons for this position are discussed in Wiseman 2014.

A recent detailed study of the Three Rivers Redware series of types (Wiseman in press) shows several important things: (1) the initial production of all types in the series was sequential, yet, once created, small numbers of each type continued to be made until production of pottery ceased at the end of farming village occupation in the region sometime around A.D. 1400; (2) the average widths of the lines in each successive type form a continuum, rather than displaying discrete breaks from one type to the next (wide to very narrow, from earliest to most recent), essentially negating any major significance among the types since they are supposedly distinguished primarily on the criterion of line width and the presumption that this difference is time sensitive [as per (a)]; (3) the Three Rivers R/t type was the most commonly made and most widely distributed/traded type of the series; and (4) the consistent occurrence of the various types in Sierra Blanca pottery assemblages suggests that they held a position of special significance, perhaps not unlike the world-wide use of red-colored materials and items starting hundreds of thousands of years ago during the Neanderthal period and continuing to the present day.

The present study developed from years of observation of differences in Lincoln B/r sherds from site to site and region to region. For instance, studies of various assemblages have shown inconsistency in characteristics such as surface colors and tempering agents. Also, broadly speaking, Lincoln B/r has two basic styles of design, the Three Rivers style and the Lincoln style. The Three Rivers style is a continuation of the style characteristic of Three Rivers R/t (Stewart 1979, 1981) in its use of the entire interior surfaces of bowls for designs that emphasize lines embellished to varying degrees with small solid elements. The Lincoln style continues the heavy emphasis on line work and use of a limited variety of solid elements seen in the Three Rivers style but confines them to a band, or sometimes two bands, just below the rim of bowl interiors.

Although Mera and Stallings note that some Lincoln sherds have light orange surfaces (mostly interior), others have good orange-red and even red ones. They venture the opinion that sherds bearing light orange (or terracotta) surfaces probably reflect early forms of the type because of the development from Three Rivers R/t. However, this appears not to be the case because sherds of both variations appear to be roughly contemporaneous late in time and that the difference may instead derive from manufacture source and exchange patterns from those sources. In my experience, the overall impression is that Lincoln sherds in the Roswell area have mainly terracotta-colored interior surfaces (though Lincoln evidently was not produced there) (Wiseman 2002, 2004), which contrast rather sharply with the redder-surfaced Lincoln sherds from sites like LA 12156 and LA 588 in the Capitan Mountains to the west (Wiseman 1975 and this study).

Regarding tempering materials, at least three general categories are currently recognized: (1) sherds primarily containing Sierra Blanca gray feldspar syenite; (2) sherds containing primarily aplitic, leucocratic igneous materials, including Capitan monzonite and quartz monzonite (or alaskite, or granite, etc.) and very similar rocks; and (3) combinations of (1) and (2), wherein both categories of temper are present in roughly equal proportions by grain count estimation. As will be seen shortly, the No. 3 category in the assemblages of the study sites are actually dominated by No. 2 minerals and contain less than half #No. 1 minerals. Some sites, such as those at Roswell (Wiseman 2002, 2004), are sometimes found to have all three categories of temper represented. Other sites, such as LA 72851 in the southern Jornada del Muerto basin, have assemblages containing Sierra Blanca gray feldspar syenite almost exclusively (22 of 24 sherds; Wiseman 2006).

Clearly, discovery of the manufacture areas, and specific manufacture sites, in particular, of the sherds bearing these tempering materials, will prove crucial in defining both intra-regional and inter-regional social and exchange relationships. The current study provides a start toward this goal. Many more site assemblages will have to be studied in order to adequately obtain the desired results. This latter proposition will become possible when more Lincoln and late Glencoe sites are excavated.

The Site Assemblages Used in this Study

Four sites were selected for this study – LA 2112, LA 12156, LA 588, and LA 3334 (Figure 1). Major criteria in selecting these sites are that excavated collections are available from them and those collections are housed in the Archaeological Research Collections at the Center for New Mexico Archaeology in Santa Fe, New Mexico. The first three of these sites were selected because they are Lincoln phase pueblos (Kelley 1984; Wiseman 1975). In addition to the fact that the Lincoln phase is the latest prehistoric farming manifestation in the northern Sierra Blanca region, the Lincoln B/r sherds possess particularly red-colored interior surfaces that contrast rather markedly with the majority of Lincoln B/r sherds from the Roswell sites. The surfaces of the Roswell Lincoln sherds tend to be more orange like Three Rivers Red-on-terracotta. It might be mentioned here that, in general, only bowl forms are known for Lincoln B/r.

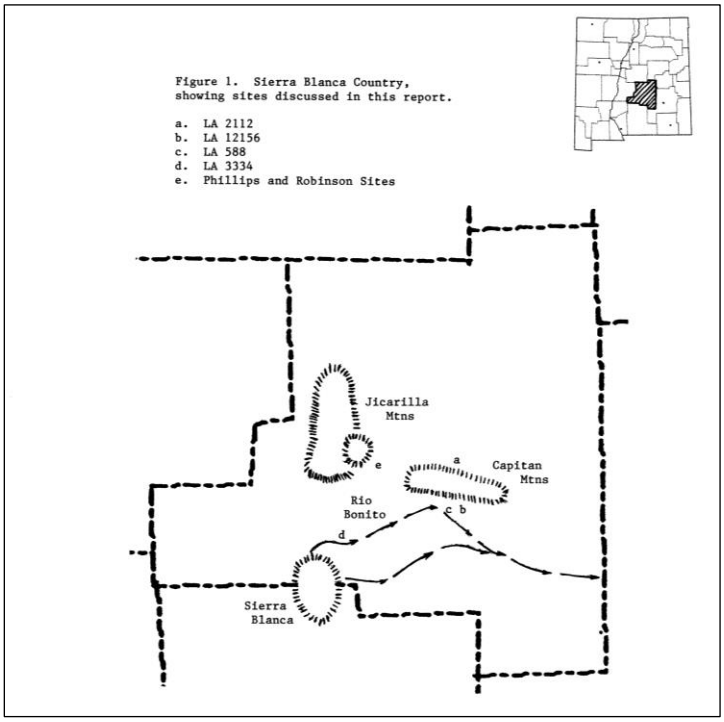


Figure 1. Sierra Blanca Country showing sites discussed in this report.

Given these surface color and temper differences among Lincoln B/r sherds, they were accepted as *prima facie* evidence that the pottery type was made in a minimum of two to three locales, or even as few as two to three sites. Given the fact that so few Lincoln phase sites are known to exist, or to have existed (some are now totally destroyed), it seemed logical to start with investigating sites LA 588 and LA 12156, both of which are located south of the Capitan Mountains. LA 2112 was added because it was an important settlement north of the Capitan Mountains.

As will be related shortly, the fourth site, LA 3334, a late Glencoe phase site situated in the upper Rio Bonito valley, was added to this study about mid-way through the analysis because

preliminary work on the assemblages from the first three indicated that one or more sites located closer to Sierra Blanca were also probably involved in making Lincoln B/r. As far as we know at present, the igneous rock known as Sierra Blanca gray syenite (SBgs) derives from that mass and would not have been directly available for use as tempering material to the potters at LA 12156 and LA 2112. SBgs might have been available to potters of LA 588 since that site is also situated along the Rio Bonito but lower down in the valley. The Rio Bonito and its headwaters drain the northeastern slopes of Sierra Blanca, making it possible that eroded constituents of SBgs, mixed with other rock types from Sierra Blanca, might be available along its valley.

Before moving to brief individual descriptions of the sites used in this study, it must be noted that one and possibly two probable Lincoln B/r manufacture sites have already been reported in the literature. The better known example is the Phillips or Phillips Ranch Site, for which Jane Kelley (1984:221) reports that a local pothunter recovered "49 bowls [of Lincoln B/r] in varying stages of completion." The Phillips Site, consisting of a large cluster of small pueblo roomblocks representing both the Corona and the early Lincoln phases, is situated between the Capitan and Jicarilla Mountains in the headwaters of the Arroyo del Macho of central Lincoln County (Kelley 1984:199-251). The Lincoln B/r from this site has not been studied but should be as soon as practicable. The collections from Phillips are housed at the Museum at Texas Tech University in Lubbock.

The second possible production site, Robinson Pueblo, is located a short distance north of the Phillips Site. Kelley (1991) conducted survey and excavations there and in the surrounding area in the mid-1980s. She also had petrographic work done on a total of 200 sherds of several pottery types selected from among the different site collections (Garrett 1991). Of the 19 Lincoln B/r sherds included in Garrett's study, all but one are tempered with quartz monzonite, which includes mostly, if not solely, the Capitan monzonite/quartz monzonite discussed herein. Since these reports are only summaries by project participants, details are not included.

The Sites

The order of the site descriptions, like that throughout this paper, reflects their geographic positions starting on the north with the Capitan Mountains and ending with LA 3334 on the south, which is closest to Sierra Blanca. The two northern-most sites, LA 2112 and 12156, have the best access to the Capitan-derived materials and LA 3334 has the best access to Sierra Blanca materials. As mentioned earlier, LA 588 lies on the Rio Bonito between LA 12156 and LA 3334.

LA 2112, the Block Lookout Site or the Smokey Bear Ruin sits on a small, semi-isolated hill a short distance north of the Capitan Mountains and within the headwaters of the Arroyo del Macho. The ruin is located partly on the Lincoln National Forest and partly on private land. Details about the architecture and site layout are sketchy because of flattening of the Forest part for a fire lookout and severe pot hunting on the private part. Excavations by Jane Kelley (1984) in the early 1950s, minor excavations in the late 1960s (Wiseman 1975; Wiseman et al. 1971; Wiseman et al. 1976), and interviews with one of the local diggers, suggest that the site consisted of several relatively small, mostly mud ("adobe") pueblos scattered over the hill top. In some cases, earlier pueblo rooms were leveled and rebuilt upon, resulting in at least some structural

super-positioning. Cultural refuse had accumulated to depths of a meter or more on some hill slopes and up to three meters deep as fill overlying and within communal pit-structures. According to one local collector, the site was renowned from "New York to California" for the number and excellent condition of human burials and the richness of its trash deposits. This site was clearly a central-place in the prehistoric occupation of the region. The site is assigned to the Lincoln phase on the basis of architecture and pottery, but it is highly likely that pithouses representing earlier occupations underlie the pueblo rooms. Wiseman's excavations were conducted on the privately-owned part of the site.

LA 12156, the Baca Site, Baca Sawmill Site, and Baca Campground Site is situated on the south alluvial/colluvial apron or bajada of the Capitan mountains. It once consisted of a pueblo with four linear blocks of mud ("adobe") rooms surrounding an open space or plaza. The room count is estimated at 100 or more. Sometime during the early 20th century, the south roomblock was bulldozed to build a ramp for a saw mill located immediately south of the pueblo. A single pueblo room excavated in the mid-1960s provides Lincoln sherds for this study (Wiseman 1975). The site is assigned to the Lincoln phase based on its architecture and pottery assemblage. The existence of earlier components underneath the pueblo is as yet undetermined. The site is privately owned.

LA 588, the Salas component of the Priest Canyon Site is situated on the south terrace of the Rio Bonito upstream from Lincoln, New Mexico. The Salas Site is a linear pueblo of 10 to 15 rooms composed mainly of local mud ("adobe"). A second linear pueblo may be present to the west, but an overlying Hispanic component obscures it. Both mounds were tested by means of trenches in the late 1960s. A test pit was also excavated into a linear borrow pit parallel to the east roomblock. The Salas component has been assigned to the Lincoln phase based on its architecture and pottery assemblage (Wiseman 1975), but the rest of this large site consists of pithouses that probably belong to the initial, early, and/or middle Glencoe sub-phases. The site is on private land.

LA 3334, the Angus Site is located on the north terrace of the Rio Bonito in the upper part of its valley. This site was first partially excavated in the mid-1950s by the Museum of New Mexico for the state highway department but no report was produced. A second road project required revisiting the site in 1999 at which time some of the earlier investigated structures were re-excavated and new ones were located and excavated (Zamora and Oakes 2000).

Two things are important to keep in mind about this site and its collections. First, in some cases, structures re-excavated in the 90s do not readily match with the ones excavated in the 50s even though they probably should be based on their locations with respect to certain site characteristics. And, most importantly, since the site area was groomed and contoured at the end of the construction in the 50s, dirt containing artifacts not recovered at that time by the archaeologists was moved back and forth across the site destroying original associations and refilling the structures excavated in the 50s. This, of course, does not apply to the new structures found and first excavated in the 90s; the lower fills of these new structures were clearly untouched by the excavations in the 1950s. Thus, some architectural and spatial associations within the site are reliable and others are not. It is not always clear which is which.

Since at least two kinds of pit-structures were uncovered by the two excavation projects, it seems likely that more than one period of occupation is represented. One thing that is clear is that the late Glencoe phase is well represented by some of the structures and by the pottery assemblage. The late Glencoe phase, roughly equivalent to the Lincoln phase of the northern Sierra Blanca region, is dated approximately A.D. 1250 to 1400.

The Pottery Samples and the Analytical Procedures

The Lincoln B/r samples from each site are all small. Lincoln is never a particularly common type in any of the assemblages (range of 1% to 5% in most cases). In uncommon assemblages from other sites in the region, at least one small lot from the Phillips site contained 52% Lincoln B/r [Kelley 1984:231]).

The numbers of sherds used in the study samples are: LA 588- 24; LA 2112- 18; LA 3334- 77; and LA 12156- 35, for a total of 154 sherds. Each sherd was examined and measured individually. Optical examination was facilitated by a binocular microscope set at 30 diameters (30 "power") and a fiber-lite illumination source. Sherd thickness was measured using steel calipers graduated in 1 millimeter increments. Measurements were estimated to the nearest one-half millimeter by interpolation. The attributes monitored are:

Paste color and color combinations: generally expressed as the dominant color (red, orange, brown, gray, black), modified by adjectives denoting brightness (light, medium, dark) and shades introduced by other but non-dominant colors (reddish-, orangish-, brownish-, grayish- etc.); pastes bearing two or three distinct colors are referred to as being "zoned" when those zones or bands constitute at least a quarter or more of the sherd thickness; color bands that are very narrow (1 mm wide) and are located next to either sherd surface are not counted as zonation in this analysis. As always in the analysis of Southwestern pottery, free carbon in the form of a natural constituent in the clays and occasionally as the result of use or accidental burning injects a smudgy appearance onto and into most sherds, making color descriptions a difficult exercise.

Interior and exterior surface colors: expressed according to the Munsell Soil Color charts (5YR 5/8, 7.5YR 5/6, etc.) and their general equivalents (yellowish-red, strong brown, etc.). Since many sherd surfaces, especially the exteriors, have greater or lesser degrees of fire-clouding and/or sooting, the color characterizations are determined for those areas that appear to have been the least affected from these sources. Overall, very few exterior surfaces lacked fire-clouding (grays and blacks) as the primary color characterization, even though the system used here emphasizes "successful" firings of lighter, usually orange to reddish-orange colors. Lincoln B/r sherd exteriors are virtually all noted for their smudgy appearances caused by fire-clouding, and in some cases, by carbon deposited by post-firing processes. As mentioned above under paste color, free carbon from incomplete or non-thorough firing and other sources make difficult the use of the Munsell system (and other systems based on modern techniques) for color characterizations.

Design style: two basic styles of designs are recognized in this analysis, Three Rivers and Lincoln.

Three Rivers designs are typically seen on the Lincoln predecessor type Three Rivers R/r. These designs are characterized first and foremost by groups or bundles of parallel narrow lines that move around immediately below and parallel to vessel rims and occasionally strike across the vessel bottoms from one rim to another. The number of lines in a bundle can vary from two to as many as five. Small solid elements such as triangles are occasionally attached to the outside lines of such bundles. Open spaces created or enclosed by line bundles often contain fillers composed of line fret motifs and occasional solid elements placed along those fret motifs. Curvilinear lines in the form of scrolls and checkerboards of diamonds are also occasionally present. Other open spaces may be left empty or devoid of design.

Lincoln designs are bands of lines placed below and parallel to vessel rims. Individual lines average wider that those in the Three Rivers style. The bands may be continuous around the bowl or they may be internally segmented into six or so panels of equal size. Small solid elements, such as triangles, key designs, and cloud symbols, are usually incorporated into the bands as opposed figures on the ends of lines. Lincoln style designs are usually believed to have developed as a result of the appearance of Rio Grande Glaze A Red (a.k.a. Agua Fria Glaze-on-red, Rio Grande Glaze I, etc.) as trade items from central and northern New Mexico. Supporting this assertion, sherd (# 64) from LA 588 displays a very clear example of a design straight from the repertoire commonly seen on Rio Grande Glaze A Red vessels. Joe Stewart (1979, 1981) has published excellent discussions and illustrations of Three Rivers and Lincoln designs based on design symmetry analysis.

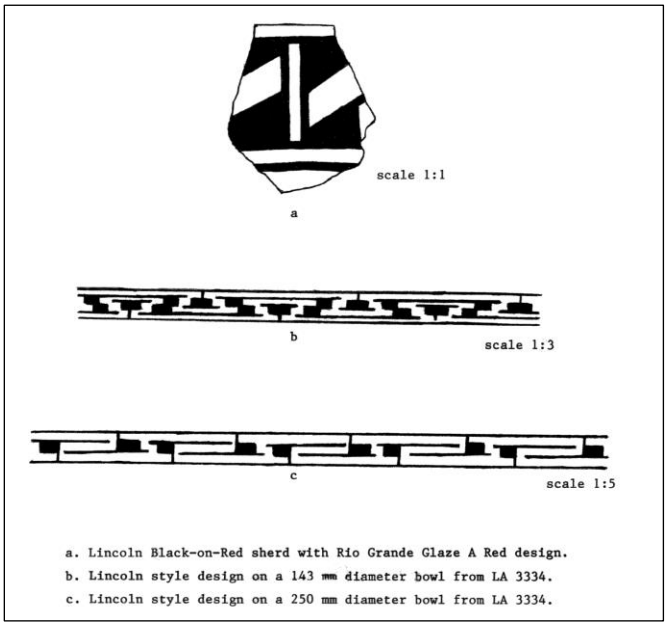


Figure 2. Lincoln Designs

Sherd thickness: the thickness of each sherd was measured to the nearest 0.5 mm using standard metallic calipers marked in one millimeter increments. Measurements were taken from two or more edges of larger sherds and recorded as ranges. Measurements on small sherds are usually expressed as single readings.

Tempering materials: aplastic particles, some of them intentionally added by the potters and others present because they are natural constituents of the potting clays, were noted and recorded by means of a short-hand script developed by the author over the years. The dominant minerals are noted first, along with their colors. Relative particle sizes and their abundance were noted for three of the sites (LA 588, LA 2112, and LA 12156). The temper grains from LA 3334 were not systematically recorded in this manner because it became clear that these characterizations were constant across the samples from all four sites. Less common minerals are noted in their order of abundance.

Particular attention was paid to the presence of tiny red bits and black bits of minerals that are generally too small to identify without higher magnification, or preferably, petrographic examination. The red bits are probably mostly, if not solely, hematite or "red ochre." The black bits may be any of several minerals, including black hematite, magnetite, hornblende, and augite. In many sherds, the red bits and black bits are clearly iron minerals, for the red ones are restricted to the oxidized parts of the paste and the black ones to the neutral and reduced parts. The reason for this interest in the red bits and black bits derives from the idea that iron compounds may have been intentionally added to the pastes of some vessels in order to produce the redder paste and surface colors. During the analysis, this apparently turned out not to be the case, for very few sherds contain noticeable quantities of these constituents, and there seems to be no correlation between the amount of red constituents and the degree of redness of the paste or the surfaces. Additionally, these minerals are normally found in small quantities in the igneous rocks of the Sierra Blanca region and therefore may have been introduced when the rocks were added to the pottery as tempering material.

Analysis Results

The results of the analyses are presented here on a site by site basis in order to be able to characterize the sherds from each site as a whole and then compare these characterizations against one another.

Paste Color

The pastes of the Lincoln B/r sherds from each site include a variety of light and dark colors, some of them of single colors and others of two (bi-zoned) and three (tri-zoned) colors. These color categories are further subdivided into lighter oxidized colors versus darker oxidized and non-oxidized colors. The lighter oxidized colors include those categorized as medium orange, medium orange-red, medium brownish-red, and bi-zoned and tri-zoned combinations containing one of the first three. We presume that, for the most part, the lighter oxidized colors were the ones sought by the potters and constitute the successful firings. Table 1 presents the results. The values for LA 588, 12156, and LA 3334 are very similar and represent greater representation of successful colors in the Lincoln B/r from these sites.

Vessel Interior Surface Color

Like the paste colors, the Lincoln B/r sherds also include a variety of light and dark colors. In this instance, the Munsell series was used to characterize the colors. Again, lighter, oxidized colors in the red, yellowish-red, and reddish-yellow colors are considered to be the successful ones. Among those that are brown, gray, and variations thereof, and especially those that are qualified as strong, dark, and very dark are unsuccessful and even failures relative to the desired color outcomes. Table 2 presents these results. Again, the percentages of successful colors of sherds from LA 588 and LA 12156, and to a slightly lesser degree LA 3334, are most similar, while those from LA 2112 are noticeably less so.

Table 1. Lincoln Black-on-red paste colors by site.

Site	**Successful Colors (Lighter, Oxidized)**		**Unsuccessful Colors (Darker)**	
	Number	**Percent**	**Number**	**Percent**
LA 2112 (n=18)	7	39%	11	61%
LA 12156 (n=35)	23	66%	12	34%
LA 588 (n=24)	17	71%	7	29%
LA 3334 (n=77)	56	73%	21	27%

Table 2. Lincoln Black-on-red vessel interior surface colors by site.

Site	**Successful Colors (Lighter, Oxidized)**		**Unsuccessful Colors (Darker)**	
	Number	**Percent**	**Number**	**Percent**
LA 2112 (n=18)	10	56%	8	44%
LA 12156 (n=35)	26	74%	9	26%
LA 588 (n=24)	18	75%	6	25%
LA 3334 (n=77)	53	69%	24	31%

Vessel Exterior Surface Color

Exterior surface color on Lincoln B/r bowls is notorious for reflecting a lack of concern for color esthetics. The potters were satisfied with mottled neutral-, reduced-fired, and fire-clouded colors, often with spots here and there of oxidized colors. In the analysis reported here, every attempt was made to locate the occasional oxidized spots and record those colors. Thus, the sherd exterior surface colors recorded in Table 3 are brighter than would ordinarily be the impression gained from seeing the entire vessel exterior. Perhaps unsurprisingly, the values for the brighter colors for sherds from LA 588, LA 12156, and LA 3334 are similar and are greater than those for LA 2112.

Design Style

Three design styles and a category of "uncertain" were recorded (Table 4). The surprise in all of this is the presence of one Lincoln sherd from LA 588 bearing a Rio Grande Glaze A Red (a.k.a. Agua Glaze-on-red, Rio Grande Glaze I, etc.) design (Figure 2(a)). As with the other attributes discussed thus far, the values for LA 588, LA 12156, and LA 3334 are similar and differ markedly from those for LA 2112.

Table 3. Lincoln Black-on-red vessel exterior surface colors by site.

Site	Successful Colors (Lighter, Oxidized)		Unsuccessful Colors (Darker)	
	Number	Percent	Number	Percent
LA 2112 (n=18)	4	22%	14	78%
LA 12156 (n=35)	16	46%	19	54%
LA 588 (n=24)	13	54%	11	46%
LA 3334 (n=77)	33	43%	44	57%

Table 4. Lincoln Black-on-red design styles by site.

Site	Three Rivers		Lincoln		Rio Grande		Uncertain	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
LA 2112 (n=18)	13	72%	5	28%	---	---	---	---
LA 12156 (n=35)	13	37%	20	57%	---	---	2	6%
LA 588 (n=24)	9	38%	12	50%	1	4%	2	8%
LA 3334 (n=77)	33	43%	40	52%	---	---	4	5%

Sherds from two restorable bowls of Lincoln B/r were recovered from multiple proveniences at LA 3334. Both display examples of Lincoln style bands that lack internal sub-division into panels (Figure 2(a) and (b)).

Vessel Wall Thickness

Graphs of vessel wall thickness values for LA 588, LA 12156, and LA 3334 are presented in Figure 3. LA 2112 is omitted here because of its small sample size. The curve for LA 588 is the classic bell shape with a single mode at 6 mm and a range of 3 mm to 9 mm. The curve for LA 12156 is skewed slightly left, has a single mode at 5.5 mm and a range from 3.5 mm to 8 mm. And, the curve for LA 3334 is skewed right, with a mode at 6.5 mm and a range from 3.5 mm to 9 mm. On the whole, the sherds from LA 12156 are the thinnest on average, while those from LA 3334 are significantly thicker.

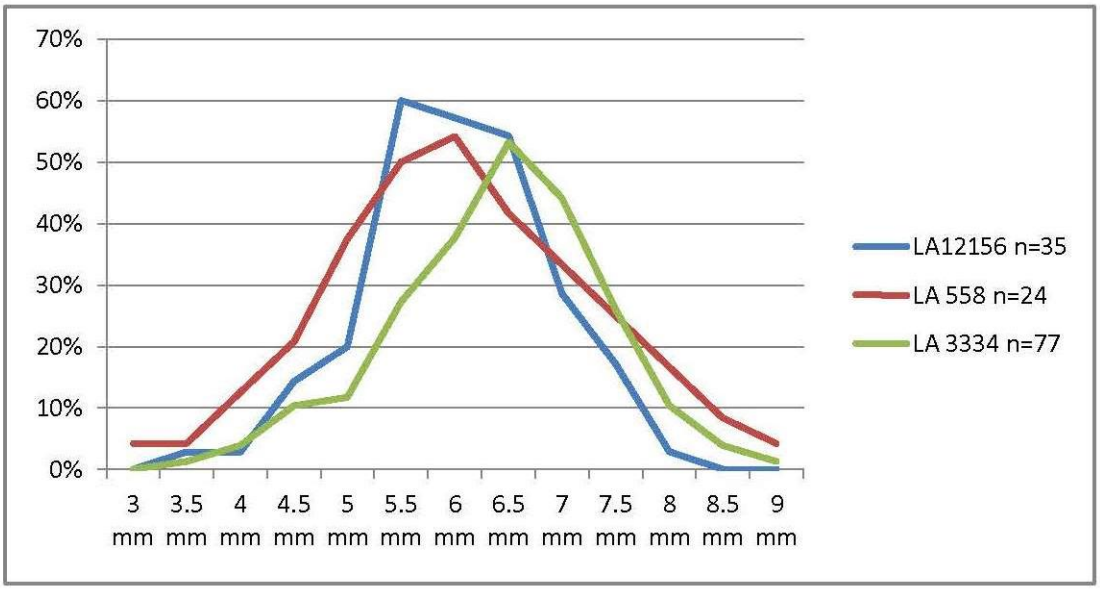


Figure 3. Lincoln Black-on-Red Sherd Thickness (to nearest 0.5 mm) for 3 Sites
Note: LA2112 is omitted due to its small sample size

Tempering Materials

The tempering materials from these four sites are limited in terms of primary sources and can be characterized in three groups (Table 5). In the following discussion, the short-hand SBgs refers to Sierra Blanca gray syenite.

(1) Monzonite and similar igneous rocks, plus a limited amount of SBgs;

(2) Monzonite and similar igneous rocks, but no SBgs;

(3) Sierra Blanca gray syenite (SBgs), with or without minor amounts of other minerals such as monzonite.

Monzonites occur in both the Capitan Mountains and the Sierra Blanca. Under the right conditions, the Capitan monzonites are fairly distinctive for their crystalline appearance, grains of fairly equal size, and their aggregates that display this latter characteristic to good advantage. Other monzonites are also found in the Sierra Blanca. In general, the Sierra Blanca monzonites are more variable in grain size and less crystalline in appearance than are those from the Capitans. Nonetheless, differentiation of the monzonites from these two sources is frequently difficult. First, most grains of the Capitan and Sierra Blanca monzonites are quite small, even at 30 power magnification. Second, many of the pastes in which they occur contain varying degrees of free carbon, which precludes clear observation and, therefore, distinguishing of the grains.

In terms of the potential for natural water transport of these materials, LA 2112 and LA 12156 are situated within the stream systems emanating from the Capitan Mountains. Thus, the dominance of Capitan monzonites and quartz monzonites as major or even sole tempering agents in pottery can be expected. LA 3334 and LA 588 are along the Rio Bonito, which drains the northeast side of the Sierra Blanca. However, LA 588 might also receive some Capitan

monzonite from the Capitans through Salazar canyon, a tributary that enters the Bonito a few kilometers upstream from the site. LA 3334, being located the closest of the four sites to the Sierra Blanca, might be expected to produce pottery containing larger quantities of gray feldspar derived from Sierra Blanca gray syenite (SBgs) than the other three.

The analysis of the tempering materials shows clinal differences among the sites (Table 5). While some of these differences may be due to sample size problems, most are suspected to derive from geographic location. The sites in the table are arranged from north to south (west), from the Capitan Mountains toward Sierra Blanca.

LA 2112 has the highest percentage of "monzonite without Sierra Blanca gray syenite (SBgs)" and the next lowest percentage of "SBgs with or without some monzonite". LA 12156 has the next highest percentage of "monzonite without SBgs" and the lowest percentage of "SBgs with or without some monzonite." Both sites are the farthest from the source of SBgs.

Table 5. Lincoln Black-on-red tempering material categories by site.

Site	Monzonite plus minor SBgs		Monzonite with no SBgs		S.B. Gray Syenite (SBgs) w/ or w/o Monzonite	
	Number	Percent	Number	Percent	Number	Percent
LA 2112 (n=18)	11	61%	6	33%	1	6%
LA 12156 (n=35)	25	71%	9	26%	1	3%
LA 588 (n=24)	19	79%	1	4%	4	17%
LA 3334 (n=77)	60	78%	0	0%	17	22%

LA 588 and LA 3334, on the other hand, are not only closer to Sierra Blanca, but they are also situated along the Rio Bonito, a major drainage of that mountain mass, and are in a position to receive SBgs in its stream deposits. As might be expected, the pottery from these two sites contain the highest percentages of "monzonite plus SBgs", as well as the highest number of sherds with "SBgs" as the sole tempering constituent, or when other minerals are also present, as co-dominants. In fact, the examples of "monzonite with SBgs" among the LA 3334 assemblage also contain more SBgs fragments per sherd than any of the sherds from the other two sites.

Petrographic Analysis of Lincoln Black-on-Red Ceramics, David V. Hill Ph.D.

Abstract:

The goals of the present study are to identify groups of ceramics that share a common suite of minerals and rock fragments present in their ceramic pastes and to identify potential sources where Lincoln Black-on-Red may have been produced.

Methods

The ceramic samples were analyzed by the author using a Nikon Optiphot-2 petrographic microscope working between 20X and 200X examining each thin section using both plain and cross-polarized light. The sizes of the inclusions present in the paste are presented in terms of the Wentworth Scale, a standard method of characterizing particle sizes in sedimentology and the range of actual measurements (Table 6). The sizes of the isolated mineral grains and rock fragments were measured using a graduated reticle built into one of the microscopes optics and compared with standardized charts. The percentages of inclusions observed in the paste of the sherds were estimated using comparative charts (Matthew et al. 1991; Terry and Chilingar1955). Given the diversity of the inclusions that are often present in archaeological fired clay materials, the comparative method for assessing the amount and size of materials observed in fired materials has been found as useful for archaeological petrography as point counting (Mason 1995).

The analysis was conducted by examining the twenty thin-sections and generating a brief description for each of the samples. The ceramic samples were also assigned to preliminary composition groups. The sherds assigned to one of the composition groups were then compared to one another to confirm assignment to each group. Rather than reliance on the identification of a single type of unusual mineral or rock fragment or statistically derived composition groups that rely on sampling an unidentified range of variation the current study relies on the direct comparison between samples for the classification of compositional groups using a combination of attributes that included the types of minerals and rock fragments present and their size and percentage in the ceramic paste. Identifying manufactured materials such as potsherd temper in thin section requires the monitoring of specific attributes such as the presence of a continuous boundary between the potsherd temper and enclosing ceramic paste (Whitbread 1986). Ideally, petrographic studies should be supported using additional analytical techniques used to characterize ceramic pastes such as LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectroscopy) or INAA (Instrumental Neutron Activation Analysis). The results of the analysis of the samples of ceramics and clays are presented below in the description of the petrographic sample and in Table 6.

Analysis of the Petrographic Sample

[Note: In the following individual sherd descriptions, the sherd numbers include Hill's catalogue number before the slash mark and Wiseman's analysis number after the slash mark.]

It should be noted that I have made some relatively minor changes in Hill's original Table 1 in order to: (1) arrange the sites in order from north to south (from the Capitan Mountains to the foothills of Sierra Blanca), (2) use only Wiseman's analysis numbers (though Hill's catalogue numbers still appear in the individual sherd descriptions), (3) add a column of Hill's paste groups, and (4) standardize the wording in the Type of Major Inclusion column.

In the first column of Hill's original Table 2, I have (1) rearranged the sites from north to south and (2) added the Wiseman analysis numbers under each Composition Group.

LA 2112

Sherd 194/6 The ceramic paste of this sherd is black in color. The ceramic paste contains abundant fragments of aplite granite and minerals derived from the same source.

Sherd 195/11 The ceramic paste of this sherd is very dark brown to black in color. The ceramic paste contains abundant sediments derived from a plutonic source. The paste contains sub-angular quartz, untwinned alkali feldspar and plagioclase. The abundant silt size to fine sized mineral grains gives a sandy appearance to the paste. However, one percent of the paste is taken up with angular fragments of alkali feldspar and quartz.

The medium reddish brown color and the presence of fragments of aplite granite and mineral grains derived from aplite granite in this sherd is identical to that of Sample 103. However, there is a slightly smaller amount of inclusions in this sherd relative to Sample 103. A trace amount of

Sherd 191/17 Sample 17 has a light reddish brown color like Samples 60 and 69. Unlike the previous two samples Sample 17 has a greater amount of silt-sized to fine sized quartz and untwinned alkali feldspar inclusions relative to the two sherds from LA 588.

Sherd 191/18 The ceramic paste of this sherd is dark brown. The paste contains primarily sediments derived from aplite granite. A trace number of fragments of aplite granite are also present in the ceramic paste. A trace amount of coarse to very coarse sized angular grains of alkali feldspar are also present in the ceramic paste.

LA 12156

Sherd 44170/26 The ceramic paste in this sherd is medium reddish brown in color. The mineral grains and fragments of rock that are present in the paste of this sherd are derived from an aplite granite. A single coarse-sized fragment of untwinned alkali feldspar is also present in the paste of this sherd.

Sherd 44170/28 The paste of this sherd is nearly identical to Sample 26 in terms of having a similar color of the clay body, presence of fragments of granite aplite and minerals derived from the same material.

Sherd 44170/29 The medium reddish brown colored paste and presence of aplite granite, inclusions from the aplite source and coarser sized feldspar grains present in this sherd are virtually identical to those of Sample 26 and 28.

Sherd 44170/31 The paste and inclusions present in this sherd are virtually identical to the previously described Samples 26, 28, and 29.

Sherd 44170/33 This sherd has a medium reddish brown color as the previously described sherds from this site, the sherd has a lower percentage of mineral grains and rock fragments than the other sherds examined from this site. No fragments of aplite granite were observed. Isolated grains of quartz and untwinned alkali feldspar are present in the paste of this sherd.

Sherd 44170/45 The ceramic paste in this sherd is medium reddish brown in color. The mineral grains and fragments of rock that are present in the paste of this sherd are derived from an aplite granite. A trace number of coarse-sized fragments of quartz and untwinned alkali feldspar are also present in the paste of this sherd.

LA 588

Sherd 48278/57 The paste of this sherd is dark brown. The paste contains angular sediments that are derived from weathered granite or quartz monzonite. The sediments consist primarily of untwinned or microcline twinned alkali feldspar and account for ten percent of the ceramic body. The feldspar grains range in appearance from highly weathered to fresh in appearance. Quartz and plagioclase are present in about one third the amount of the alkali feldspars.

Rounded yellowish gray fragments of caliche may up about three percent of the ceramic paste. The caliche grains range from fine to medium sized. Like the mineral grains the fragments of caliche also represent natural inclusions in the ceramic body.

Sherd 48278/58 The ceramic paste of this sherd is light grayish brown. The ceramic paste contains rock fragments and sediments derived from aplite granite. The rock fragments contain fine-textured angular grains of quartz, untwinned alkali feldspar and plagioclase. Angular grains composed of the same minerals as are present in the rock fragments make up about 95 percent of the inclusions observed in the ceramic paste. A trace amount of weathered angular coarse-sized inclusions of untwinned alkali feldspar are also present in the paste of this sherd.

Sherd 48278/60 The ceramic paste of this sherd is a light reddish brown. The ceramic paste contains angular rock fragments and sediments that are derived from granite. The fragments of granite are composed of equi-granular inclusions of quartz, untwinned alkali feldspar and plagioclase. These minerals range are also present as isolated inclusions in the ceramic paste. The mineral grains and rock fragments range in size from medium to very coarse.

Also, present in the paste are smaller, silt-sized to fine, individual grains of untwinned alkali feldspar and quartz. Due to the small size of these mineral grains, determining the amount of alkali feldspar and quartz relative to one another.

Sherd 48278/64 The ceramic paste is dark brown. The ceramic paste contains pieces of aplite granite along with individual grains derived from a much coarser texture of granite. The temper presents a bimodal appearance with the fragments of granite aplite and coarse-to very coarse sized grains of quartz and untwinned alkali feldspar.

A trace amount of medium to coarse sized fragments caliche is also present in the ceramic paste.

Sherd 48278/69 Sample 69 shares the same light reddish brown colored ceramic paste as Sample 69. Like Sample 60, Sample 69 contains fragments of aplite granite along with mineral grains derived from aplite granite. Also, present in the paste of the sherd are larger fragments of untwinned alkali feldspar and quartz.

LA 3334

Sherd 315/90 The ceramic paste in this sherd is medium reddish brown in color. The mineral grains and fragments of rock that are present in the paste of this sherd are derived from an aplite granite. A single very coarse-sized fragment of a much coarser textured granite is also present in the paste of this sherd.

Sherd 315/103 The ceramic paste in this sherd is medium reddish brown in color. The mineral grains and fragments of rock that are present in the paste of this sherd are derived from an aplite granite. A single very coarse-sized fragment of a much coarser textured granite is also present in the paste of this sherd.

Except for the greater amount of silt-sized to very fine sized grains of quartz and untwinned alkali feldspar that are present in this sherd relative to Sample 90 both sherds appear to have been made from the same source of raw materials.

Sherd 315/109 The medium reddish brownish color, and the presence of fragments of aplite granite and mineral grains derived from aplite granite in this sherd is identical to that of sample 103. However, there is a slightly smaller amount of inclusions in this sherd relative to Sample 103. A trace amount of coarse to very coarse sized inclusions of untwinned alkali feldspar are also present in the paste of this sherd.

Sherd 37849/129 Like the previous two samples this medium reddish brown colored sherd contains a mix of fragments of aplite granite, isolated mineral grains from aplite granite and a trace amount of very coarse inclusions of quartz and untwinned alkali feldspar.

Sherd 37849/154 The reddish-brown color of the paste of this sherd, the presence of fragments of aplite granite, sediments derived from aplite granite and coarse-sized angular fragments of untwinned alkali feldspar strongly resemble the other sherds examined from this site.

Table 6. Type of Inclusions Present in a Sample of Lincoln Black-on-Red Sherds (modified from Table 1 in Hill's petrographic report).

LA Number	Sample Number	Paste	Type of Major Inclusion	Inclusions Percent of Clay Body	Inclusion Size*
LA 2112	6	Unk A	Sediments from aplite Granite	30%	VF-M
LA 2112	11	2	Mixed plutonic sediments- aplite granite; includes one pyroxene	3%	St-F, trace M
LA 2112	17	1	Sediments from Aplite Granite	10%	Bimodal, VF-M, 1% VC
LA 2112	18	2	Sediments from Aplite Granite	15%	St-VC

LA 12156	26	1	Sediments from Aplite Granite	30%	VF-M (identical to Sample 6)
LA 12156	28	1	Sediments from Aplite Granite	8%	St-M
LA 12156	29	1	Sediments from Aplite Granite	10%	St-M
LA 12156	31	1	Sediments from Aplite Granite	10%	St-M
LA 12156	33	1	Sediments from Aplite Granite	3%	Bimodal, St-M, trace VC
LA 12156	45	1	Sediments from Aplite Granite	10%	St-M, trace VC
LA 588	57	Unk B	Sediments from Granite**	10%	St-VC
LA 588	58	2	Sediments from Aplite Granite	15%	VF-M
LA 588	60	1	Sediments from Granite	10%	Bimodal, trace St-VF
LA 588	64	Unk C	Sediments from Aplite Granite	20%	St-C
LA 588	69	1	Sediments from Aplite Granite	3%	St-M
LA 3334	90	1	Sediments from Granite Aplite	10%	St-C
LA 3334	103	1	Sediments from Granite Aplite	15%	VF-C
LA 3334	109	1	Sediments from Aplite Granite	10%	Bimodal, St-M, trace VC
LA 3334	129	1	Sediments from Aplite Granite	15%	Bimodal, St-M, 1 VC, K-Feldspar
LA 3334	154	1	Sediments from Aplite Granite	10%	St-C

* Wentworth Scale (Scale in millimeters)

VC	Very Coarse	2.0-1.0
C	Coarse-	1.0-0.50
M	Medium	0.50-0.25
F	Fine	0.25-0.125
VF	Very Fine	0.125-0.0625
St	Silt below	0.0625

** Includes 3% rounded caliche grains.

Discussion of the Petrographic Study (D.V. Hill)

Two groups of sherds and three additional sherds could be distinguished in the collection of Lincoln Black-on-red sherds (Table 7).

Group 1 sherds are characterized by having a reddish-brown ceramic paste. This group of sherds is also distinguished by the presence of plutonic sediments along with fragments of sediments weathered from aplite granite. Sparse fragments of granite aplite are in the sherds as well. Occasionally coarse to very coarse sized fragments of weathered alkali feldspar are also present in this composition group.

Group 2 sherds have a darker brown colored ceramic paste. The silt-sized to very fine sized mineral grains are likely derived from aplite granite as do Group 1 sherds. Sherds in this group contain coarse-sized weathered fragments of alkali feldspar that account for ten percent of the ceramic paste.

Three sherds could not be assigned to a specific composition group. Sample 194/6 has a very dark brown ceramic paste. The inclusions present in the paste of this sherd contain sediments derived from aplite granite and coarse-sized angular fragments of alkali feldspar. The inclusions in this sherd accounted for thirty percent of the ceramic paste, more than any other sherd in the sample of Lincoln Black-on-red.

Sample 48278/57 contains isolated sub-angular grains of alkali feldspar and quartz. Rounded grains of caliche made up an additional three percent of the paste of this sherd.

Sample 48278/64 contains sediments weathered from aplite granite and a trace number of coarse-sized fragments of alkali feldspar. This sherd also contains a trace amount of rounded inclusions of caliche.

Two different types of inclusions were observed in the sample of Lincoln Black-on-red sherds. One group of sherds contains fragments of what had been identified previously as aplite or alaskite granite primarily of quartz, untwinned alkali feldspar and plagioclase. The mineral grains in the fragments of aplite granite are roughly the same size and are fine to medium-sized.

The sherds that are described as containing sediments derived from granite are characterized by the presence of one or more very coarse to coarse sized inclusions of weathered untwinned alkali feldspar. The smaller size of the sediments derived from aplite granite and small fragments of aplite granite contrast in size with the coarse-sized angular fragments of weathered alkali feldspar.

The presence of weathered aplite granite and variable amounts of minerals derived from a plutonic source indicates that all the sherds of Lincoln Black-on-red came from a single geologically distinct region. The variation in the different inclusions present in the sherds that were identified during this study likely represents the compositional variation in the source or sources of clay used to produce Lincoln Black-on-red vessels.

Previous studies of Brownware ceramics from the Capitan and southern Jicarilla Mountains indicate that aplite granite is a common rock type that is found in the paste of these sherds (Warren 1992). It is likely that Lincoln Black-on-red was made using naturally occurring clays that contain aplite granite from one or both areas.

Table 7. Composition Groups
(modified from Table 2 in Hill's petrographic report).

Group 1 2112 17 **12156** 26, 28, 29, 31, 33, 45 588 60, 69 **3334** 90, 103, 109, 129, 154	Reddish brown paste	Sediments from aplite granite, coarse sized alkali feldspar grains, aplite fragments
Group 2 2112 11, 18 588 58	Dark brown paste	Sediments from aplite granite, coarse sized alkali feldspar grains, aplite fragments

Project Results (Wiseman)

This project has resulted in creating the most thorough description of Lincoln Black-on-red to date. Excavated collections from four sites selected for this initial study are LA 2112 (Block Lookout or Smokey Bear ruin), LA 12156 (Baca Sawmill or Baca Campground site), LA 588 (Salas component of the Priest Canyon site), and LA 3334 (Angus site).

It is important to state that this report is not the final word, but it can be characterized as a good start on refining our information on the pottery type and is a reasonable start on addressing the questions originally posed about its composition (especially the tempering materials) and visible characteristics such as vessel wall thickness and interior and exterior surface colors. However, designs were treated only in a cursory manner. The findings are as follows:

1. The redder colors of the vessel surfaces of the sherds from these sites evidently are the result of the selection of iron-rich clays to form the vessel bodies, rather than the application of iron-rich slips or of amending the clays with iron-rich tempering materials, as was originally hypothesized.
2. Capitan aplite granite (a.k.a. Capitan monzonite and quartz monzonite, alaskite, etc.) was clearly used to a large extent, indicating that the potters of one or more villages proximate to the Capitan Mountains produced some of this pottery. LA 12156 and LA 2112 may have been two such villages.
3. More sherds from the two villages located closer to Sierra Blanca, LA 3334 and LA 588, contain significant amounts of Sierra Blanca gray syenite, as was predicted. However, many more sherds contain "monzonite" (including Capitan aplite granite) than Sierra Blanca gray syenite. This was not unexpected, for the potters from these villages, if they were making Lincoln Black-on-red, were still some distance from the geologic source of

the gray syenite. Assuming that they were using locally available sands or clays containing the gray syenite, one would expect admixture of other minerals through stream transport to the vicinity of the sites in question. Even if the gray syenite observed in some of the sherds was the result of using metates and/or manos of gray syenite to grind the clays or the tempering materials, this fact would also suggest that the pottery was made closer to Sierra Blanca than to the Capitans.

4. The fact that the majority of sherds from all four sites contain monzonite *plus minor quantities of Sierra Blanca gray syenite* suggests that the potters in one or more other sites located along the Rio Bonito may also have been major manufacturers of Lincoln Black-on-red. Candidates include the Lower Stanton ruin (LA 69102, located a short distance upstream from LA 588; Shelley and Wentzel 2002). This single plaza pueblo belongs to the Lincoln phase.

5. Since the study samples were from small (limited) excavations at each of the sites, it seems quite clear that both types of designs – Three Rivers and Lincoln – were being painted on vessels throughout the production span of Lincoln B/r.

6. Two sites located in the vicinity of Patos mountain in the Jicarilla mountain group - Phillips Ranch and Robinson - are considered to be probable Lincoln production sites based on reliable reports (Kelley 1984). However, no pottery from either one was included in this study.

7. LA 2112 and LA 12156 are quite distant from Sierra Blanca and the drainages that emanate from it. Thus, those particular sherds containing Sierra Blanca gray syenite in their temper from these sites represent vessels exchanged from manufacture sites located closer to that mountain massif.

References

Brown, Emily J., R.N. Wiseman, and R.P. Gauthier

2014 *Since Mera: The Original Eleven Bulletins, with Essays and Opinions Derived from Recent Research*. Special Publication 5, Archaeological Society of New Mexico, Albuquerque.

Campbell, Kristen, and Jim A. Railey

2008 *Archaeology of the Hondo Valley, Lincoln County, New Mexico: Archaeological Investigations along U.S. 70 from Ruidoso Downs to Riverside*. Cultural Resources Technical Series 2006-1, New Mexico Department of Transportation, Santa Fe.

Elizabeth M. Garrett

1991 Preliminary Report on the Petrographic Analysis of 200 Sherds from Capitan North Areas. In *Mogollon V*, edited by Patrick H. Beckett, pp. 191-196, COAS Publishing and Research, Las Cruces.

Jennings, Jesse D.

1940 *A Variation of Southwestern Pueblo Culture*. Technical Series Bulletin 10, Laboratory of Anthropology, Inc., Santa Fe.

Kelley, Jane H.

1984 *Archaeology of the Sierra Blanca Region of Southeastern New Mexico*. Anthropological Paper 74, Museum of Anthropology, University of Michigan, Ann Arbor.

1991 An Overview of the Capitan North Project. In *Mogollon V*, edited by Patrick H. Beckett, pp. 166-176, COAS Publishing and Research, Las Cruces.

Kidder, Alfred V. and Anna O. Shepard

1936 *The Pottery of Pecos, Volume 2: The Glaze Paint, Culinary, and Other Wares*. Papers of the Southwestern Expedition, Phillips Academy no. 7. Yale University Press, New Haven.

Mason, R. B.

1995 Criteria for the Petrographic Characterization of Stonepaste Ceramics. *Archaeometry* 7(2):307-321.

Matthew, A. J., A. J. Woods, and C. Oliver

1991 Spots Before the Eyes: New Comparison Charts for Visual Percentage Estimation in Archaeological Material. In *Recent Developments in Ceramic Petrology*, edited by Andrew Middleton and Ian Freestone, pp. 211-264. British Museum Occasional Paper No. 81. British Museum Research Laboratory, London.

Mera, H.P.

1943 *An Outline of Ceramic Developments in Southern and Southeastern New Mexico*. Technical Series Bulletin 11, Laboratory of Anthropology, Inc., Santa Fe, New Mexico.

Mera, H.P., and W.S. Stallings, Jr.

1931 *Lincoln Black-on-Red*. Technical Series Bulletin 2, Laboratory of Anthropology, Inc., Santa Fe.

Phillips, W. R.

1971 *Mineral Optics: Principles and Techniques*. W. H. Freeman and Company, New York and San Francisco.

Reedy, Chandra L.

2008 *Thin-Section Petrography of Stone and Ceramic Cultural Material*. Archetype Publications, London.

Shelley, Phillip H., and Kristen E. Wentzel (editors)

2002 *Archeological Variation within the Middle Rio Bonito*. Cultural Resources Series Vol. 14, New Mexico State Office, U.S. D.A. Bureau of Land Management, Santa Fe.

Stewart, Joe D.

1979 The Formal Definition of Decorative Traditions in the Jornada Area: A Case Study of Lincoln Black-on-Red Designs. In *Jornada Mogollon Archaeology: Proceedings of the First Jornada Conference*, edited by Patrick H. Beckett and R.N. Wiseman, pp. 295-344. Cultural Resources Management Division, Department of Sociology and Anthropology, New Mexico State University, Las Cruces and the Historic Preservation Division Bureau, State Planning Office, Department of Finance and Administration, State of New Mexico, Santa Fe.

1981 Structural Analysis of Three Rivers Redware Designs. *The Kiva* 49 (1-2):39-65.

Terry, R.D., and V. G. Chilingar

1955 Summery of "Concerning Some Additional Aids in Studying Sedimentary Formations," by M.S. Shvetsov. *Journal of Sedimentary Petrology* 25 (5) 229-234.

Warren, A. Helene

1992 Temper Analysis of the Pottery of the Rio Bonito Valley. In *Investigations into the Prehistory and History of the Upper Rio Bonito, Lincoln County, Southeastern New Mexico*, by Robin E. Farwell, Yvonne R. Oakes, and Regge N. Wiseman. Laboratory of Anthropology Notes 297, Office of Archaeological Studies, Museum of New Mexico, Santa Fe.

Whitbread, I. K.

1986 The Characterization of Argillaceous Inclusions in Ceramic Thin Section. *Archeometry* 28(1): 79-88.

Wiseman, Regge N.

1975 Test Excavations at Three Lincoln Phase Pueblos in the Capitan Mountains Region, Southeastern New Mexico. *Awanyu* 3(1):6-36. Archaeological Society of New Mexico, Albuquerque.

2002 Pottery. In *The Fox Place: A Late Prehistoric Hunter-Gatherer Pithouse Village near Roswell, New Mexico*, pp. 83-114. Archaeology Note 234, Office of Archaeological Studies, Center for New Mexico Archaeology, Santa Fe.

2004 The Pottery of the Henderson Site (LA 1549): the 1980-1981 Seasons. Chapter 3 in *Life on the Periphery: Economic Change in Late Prehistoric Southeastern New Mexico*, edited by John D. Speth, pp. 67-95. Memoir 37, Museum of Anthropology, University of Michigan, Ann Arbor.

2006 Descriptions of Black-on-Red Pottery from LA 72851, Fleck Draw, Northeastern Dona Ana County, New Mexico. Submitted to Dr. Meade Kemrer, Las Cruces, New Mexico. Dated November 2006. On file in the library, Laboratory of Anthropology, Museum of Indian Arts and Culture, Santa Fe.

2014 Introduction to Mera's "Lincoln Black-on-Red." In *Since Mera: The Original Eleven Bulletins, with Essays and Opinions Derived from Recent Research*, edited by E.J. Brown, R.N. Wiseman, and R.P. Gauthier, pp. 37-40. Special Publication 5, Archaeological Society of New Mexico, Albuquerque.

In Press *The Hondo-Glencoe Project: Early 1970s Excavations along the Rio Ruidoso, Lincoln County, Southeastern New Mexico.* Accepted in 2017 for publication in the Maxwell Museum Technical Series, University of New Mexico, Albuquerque.

Wiseman, R.N., R.H. Cobean, and C.C. Pfingsten

1971 Preliminary Report of Salvage Excavations at LA 2112, Lincoln County, New Mexico. *The Artifact* 9(3):1-18, El Paso Archaeological Society.

Wiseman, R.N., M.Y. El-Najjar, J.S. Bruder, M. Heller, and R.I. Ford

1976 Multi-Disciplinary Investigations at the Smokey Bear Ruin (LA 2112), Lincoln County, New Mexico. Monograph 4, COAS Publishing and Research, Las Cruces.

Zamora, Dorothy A. and Yvonne R. Oakes

2000 *The Angus Site: A Late Prehistoric Settlement Along the Rio Bonito, Lincoln County, New Mexico*. Archaeology Notes 276, Museum of New Mexico, Santa Fe.

An Unusual Tabira Polychrome Canteen

By Regge N. Wiseman
Emeritus and Research Associate
Office of Archaeological Studies
Center for New Mexico Archaeology
Santa Fe

On an early 1990s trip the writer had the occasion to examine, photograph, and record information about a remarkable Tabira Polychrome canteen (Figures 1 and 2). Although the polychrome variant of Tabira is uncommon, its closely allied variants Tabira Black-on-white and Tabira Plain were the primary service wares in the Jumano pueblos of central New Mexico from the mid-16th century through to the abandonment of the site in the second half of the 17th century (Hayes, Young, and Warren 1981). Tabira Polychrome differs from the black-on-white pottery by the addition of yellow or red fugitive paint as filler in the design. Hayes estimates the manufacture dates for the polychrome as A.D. 1650 to 1672.

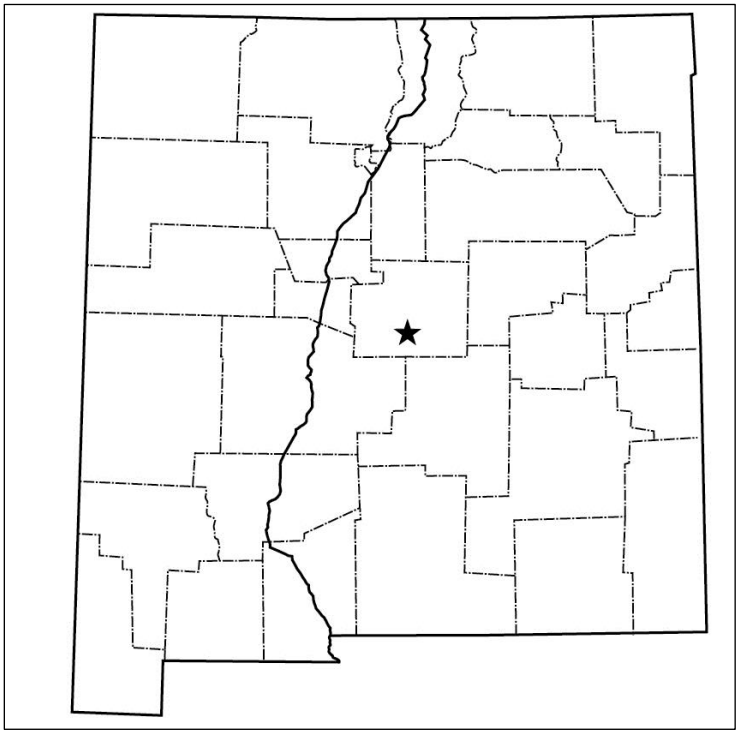


Figure 1. General Location of Tabira Pueblo, LA 51

The form of the canteen is typical for the type. The front is strongly convex, the back is flat, the neck is short and narrow in diameter with a slightly everted lip, and rope-type handles are located on each side just above the widest point on the vessel. The body at its greatest diameter is 46 cm wide, its height (base to bottom of neck) is 41 cm, and its dimension from front to back is 28 cm. The neck is 5 cm high, and the diameter of the orifice is 10 cm.

Figure 2. The Canteen

Even for a group of pottery variants that are known for unique and interesting designs, this vessel is a standout. The total effect is one of a European coat-of-arms with distinctly Native American motifs (Figure 3). Instead of a shield, the central figure is a katchina mask divided into three colored zones -- a left eye zone in white, a right eye zone in red, and a lower zone in black. The face is surrounded by a thick black line of variable width, with bulges possibly representing the four cardinal directions. Surrounding that is a wide band of red with a final outline of black. A series of squared spirals are appended to the outer line between the bulbar ears and the crown. A stalked flower with large basal leaves crowns the mask. Three flowers on a vine frame the lower half of the mask.

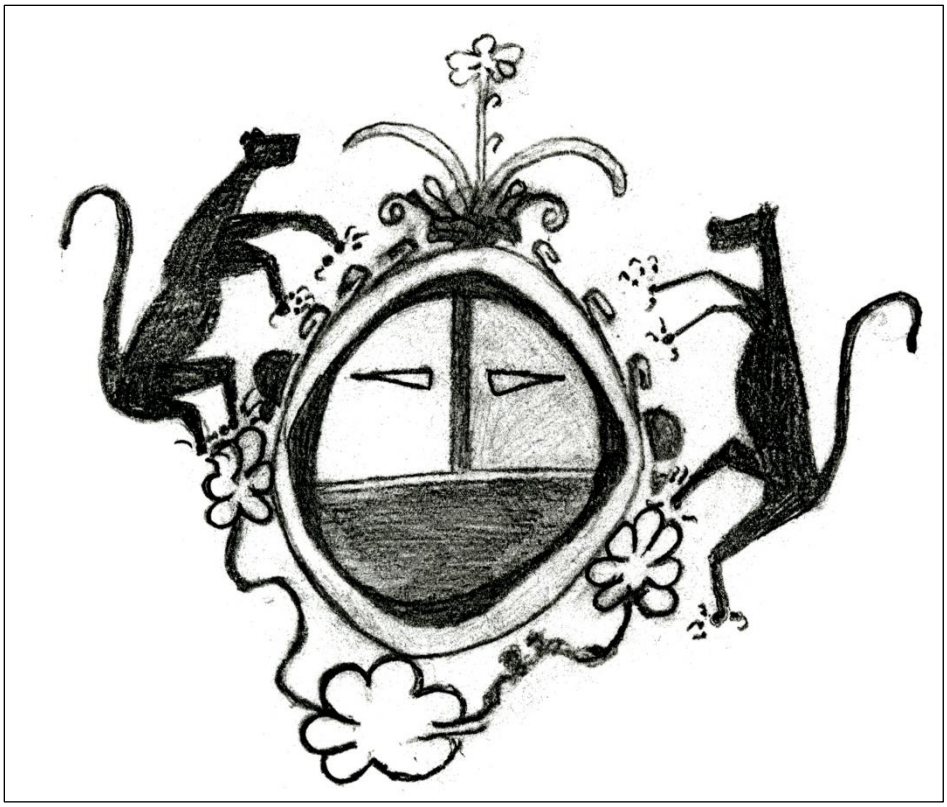


Figure 3. Drawing of the Design on the Canteen

Large animals in black are on either side of the mask. Both are more-or-less conventional mountain lion depictions with curved tails arched over their backs and comma-like claws on each foot. Although the two figures are not exact duplicates of one another in the treatment of the backs and the positions of the hind legs, the claws indicate that both supposedly depict mountain lions.

The neck of the canteen is painted black, perhaps with some small depictions of animals (?). Unfortunately, I was so enamored with the main design that I failed to get a more thorough description of this neck decoration! A wide black line extends down on both the shoulders from the base of the neck to the handles.

It is easy to conclude that the design on this canteen mimics a European coat-of-arms. Likewise, it is easy to suggest that it was made for and used by natives, for it is impossible to imagine any Spaniard of the time being willing to display it in any context involving other Spaniards. Instead, I view this vessel as a native attempt to legitimize a native institution, such as a hunting society, in a newly-learned European method of imaging.

Acknowledgements

At the time that I took the photograph and made the notes, this vessel was in the possession of a Mr. Brown, the owner of the ranch through which one had to gain access to

Pueblo Blanco or Tabira Pueblo (LA 51) in the Salinas District of central New Mexico. At the time, he said that he had dug up the vessel when he was a kid back in the 1930s or 1940s. I assumed that he dug it out of LA 51, but he did not state this, nor did I ask him. By the early 1990s, he had given the vessel to his son, Allen Brown, who lives with him at the ranch. Allen's wife is Irene. Sadly, a few years later I learned that the vessel had been sold to a collector.

I would like to thank Peter Y. Bullock, formerly of the OAS staff, for drawing Figure 3.

Reference

Hayes, Alden C., Jon Nathan Young, and A.H. Warren

1981 *Excavation of Mound 7, Gran Quivira National Monument, New Mexico*. National Park Service Publications in Archeology 16, Washington, D.C.

REPORTS

2017 Southwest Kiln Conference
by
Andy Ward

The Southwest Kiln Conference is an annual gathering of people who are trying to replicate the pottery of the prehistoric Southwest and thereby come to a better understanding of how ancient potters worked. The SWKC takes place in a different location in the Southwest each year and attracts a diverse crowd that includes archaeologists, artists, native potters and many who are just curious about this process and its peculiar mix of art and science.

Preheating Pottery (Photo: Wayne Keene 2017)

This summer the SWKC was organized by Bob Casias of Broomfield, Colorado and was held in Tijeras, New Mexico on August 4 - 6. The activities started on Friday morning at the Tijeras Ranger Station with several presentations including one by Matts Myhrman of Tucson, Arizona who has been conducting experiments with specular hematite in an effort to reproduce Trincheras Purple on Red and Nogales Polychrome pottery. After lunch the group carpooled into Albuquerque and toured the pottery collection at the Maxwell Museum, many of the potters attending specialize in the pottery of a particular culture or region and the Maxwell's diverse collection contained something for everyone in our group. On Friday evening a small group gathered at the Oak Flat Campground to paint tiles to be fired the next day.

Saturday morning began early with pottery firings at the Oak Flat Campground, there were several different types of firings including a Mesa Verde style trench kiln firing lead by Michael Savage and Cherylene Caver both from Colorado, a micaceous pottery firing by Steve Rospopo of New Mexico, a Hopi style sheep dung firing performed by Wayne Keene of Cortez, Colorado and an oxidation red ware firing by Andy Ward of Sierra Vista, Arizona. The oxidation firings were opened before lunch and the finished pottery examined while the trench kiln was smothered and left to cool until it was opened on Sunday morning. In the afternoon a group of participants went on a clay collecting field trip to a local quarry. Saturday evening the group

gathered for a barbecue but just after the food began to be served the rain started and dampened our hopes to socialize.

Opening the Kiln (Photo: Wayne Keene 2017)

On Sunday morning a group gathered at Oak Flat to open the trench kiln and see how the pots turned out. Mary Ownby of Desert Archaeology arranged for a pXRF (Portable X-ray Fluorescence) device to be available to analyze pottery, clays and minerals on Sunday morning and some potters had many samples that they wanted tested which kept the pXRF very busy.

The Group with Finished Pots (Photo: Wayne Keene 2017)

Finished Pots (Photo: Wayne Keene 2017)

Overall it was a very successful conference this year and we are looking forward to next year's conference which will be held at Edge of Cedars State Park in Blanding, Utah. Photos and test results from this year's conference will be posted on the website at www.swkiln.com as they become available.

Central New Mexico Community College Archaeology Students' Blogs
by
Susan Ruth

Central New Mexico Community College students in Sue Ruth's recent online "Archaeology Discovering Our Past" course created blogs on topics ranging from Teotihuacán to Timbuktu. These blogs are publicly available at https://paleosu.wordpress.com/. Professional and avocational archaeologists can "like" and comment on the blogs, connecting in a unique way with students interested in archaeology. This was the first archaeology course for most of the students, and the course objectives were to locate credible sources, compare archaeological finds, and critically evaluate archaeological research. Students also wrote letters to professional archaeologists asking them a specific question about their research. They were thrilled when they received a response and motivated to learn more. By interacting with and supporting students, we can foster a productive relationship with the public. So please comment on the blogs and watch your inbox for letters from CNM students!

Mata Ortiz Pottery Lecture and Sale at Crow Canyon Archaeological Center

Update by Kari Schleher

The Crow Canyon Archaeological Center welcomed geologist John Bezy and Mata Ortiz potter Oralia Lopez in early August for a lecture and pottery sale. John Bezy, who has worked with Mata Ortiz potters for 30 years and is the coauthor, with archaeologist Stuart D. Scott, of a recent book on Mata Ortiz, Chihuahua: "The Artistry and History of Mata Ortiz." This self-published book explores the archaeology and history of the Paquime region and then puts the development of Mata Ortiz as a pottery production center into historical context. A major focus of the book is to highlight many of the contemporary potters of Mata Ortiz, with beautiful photographs of many of the renowned potters included in the volume.

Examples of some of the Mata Ortiz pottery from the pottery sale.

Bezy began his lecture with an overview of the archaeology of the Paquime region and showed examples of archaeological pottery made in the region. He then discussed Juan Quezada Celado, who first developed the Mata Ortiz pottery style, based on archaeological pottery around Paquime. Juan Quezada Celado began making pottery in the 1960s and taught his family and other members of the community how to make pottery. It is a thriving tradition today in Mata Ortiz. Bezy concluded his lecture by showing examples of different styles developed in the Mata Ortiz tradition by individual and noted artists. Many of these artists were also featured in the sale, which included hundreds of pots by numerous artists. During the pottery sale, Mata Ortiz potter Oralia Lopez demonstrated how she decorates her unique pots using incredibly fine brushes made of just two hairs from children (Figure 1).

Figure 1. Pottery Oralia Lopez demonstrating her fine-line painting using a brush made with just two fine strands of human hair.

ANNOUNCEMENTS

Jornada Mogollon October 13 - 14, 2017

The El Paso Museum of Archaeology will host the *20th Biennial Jornada Mogollon Archaeology Conference* on October 13th and 14th, 2017. This year's conference will feature 27 presenters who will speak on historical, cultural, and archaeological topics relevant to the Jornada Mogollon region. Papers on the Casas Grandes area in Chihuahua, Mexico, have also been included. Pre-registration deadline is Friday, September 29. Registrations will also be accepted at the door the first day of the conference. For more information visit the website at: https://archaeology.elpasotexas.gov/events/2017/10/13/call-for-papers.

NMAC Fall Conference: November 10 – 11, 2017

Please join us for our annual Fall Conference co-sponsored by the Maxwell Museum of Anthropology. This year the free public presentation will be Friday, November 10th from 7:30 to 9 p.m. Myles Miller will be discussing the Merchant Site. This public lecture will present the new and old discoveries from the site and discuss how the combined research efforts from the 1960s and the present time have significantly changed our perspective on 14th century settlements in southeastern New Mexico. The Merchant site was a fascinating mix of

Southwestern pueblo lifeways and Plains hunting lifeways that merged to form a new way of living and social identity on the southern Plains of New Mexico during the 14th century.

Saturday, November 11th, is a full day of presentations. This year the conference is focusing on the Permian Basin Programmatic Agreement in the Bureau of Land Management, Carlsbad Field Office Area of SE New Mexico. Presentations begin at 9 am and end at 4:15 pm. NMAC is partnering with the BLM on this symposium. Talks will include an overview of the Permian Basin PA, followed by viewpoints of New Mexico SHPO and Mescalero Apache. There will be general discussions on the prehistory of the CFO area, geology of the PA area, plant utilization, and a discussion on ring middens. There will also be site specific talks on the Merchant Site, Burro Tanks, Boot Hill, and Laguna Plata. Cost for the Saturday talks is $25 for members. Not a member, join today for $25 regular and $10 students. Your membership and registration can be sent to: NMAC, P.O. Box 25691, Albuquerque, NM 87125. Questions can be sent to Cherie Walth via email to cwalth@swca.com.

Southwest Symposium: January 5-7, 2018

16th Southwest Symposium: Pushing Boundaries. Hosted by the Denver Museum of Nature & Science.

Society for American Archaeology: April 1-15, 2018

SAA 83rd Annual Meeting will be held in Washington, DC from April 11th to April 15th, 2018 at the Washington Marriott Wardman Park, 2660 Woodley Road NW, Washington, D.C. 20008; the meeting will be self-contained at the hotel. The submissions deadline is 3 p.m. EST, September 7th. The preliminary program will be posted on SAA's website in late December or early January 2018. For more information see SAA's website at http://saa.org/AbouttheSociety/AnnualMeeting/tabid/138/Default.aspx

Albuquerque Archaeological Society
Publications: 1968 – 2003 in PDF Format
Available as a 2 CD Pack for $15.00
(See Order Form on Page 37)

CONTENTS

Bice, Richard A. and William L. Sundt
1968 *An Early Basketmaker Campsite – Report on AS-1*, a Field Project of the Albuquerque Archaeological Society. Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A.
1968 *Tonque Pueblo, Docent Handbook*, for Exhibition Prepared by the Albuquerque Archaeological Society for the Museum of Albuquerque, September 7, 1968.

Barnett, Franklin
1969 *Tonque Pueblo: A report of partial excavation of an ancient pueblo Indian ruin in New Mexico.* Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A.
1970 *Basketmaker III – Pueblo I Manifestations on the Rio Puerco of the East.* Technical Notes, No. 1, Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A. and William M. Sundt
1972 *Prieta Vista: A Small Pueblo III Ruin in North-Central New Mexico.* Report of the Excavation of the AS-3 Site by the Albuquerque Archaeological Society in Cooperation with Eastern New Mexico University. Albuquerque Archaeological Society, Albuquerque.

Barnett, Franklin and William M. Sundt
1973 *San Ysidro Pueblos: Two Prehistoric Pueblo IV Ruins in New Mexico*. Albuquerque Archaeological Society, Albuquerque.

Barnett, Franklin
1974 *Sandstone Hill Pueblo Ruin, Cibola Culture in Catron County, New Mexico.* Albuquerque Archaeological Society, Albuquerque.

Wiseman, Regge N.
1986 *An Initial Study of the Origins of Chupadero Black-on-white.* Technical Note No. 2, Albuquerque Archaeological Society, Albuquerque.

Schroeder, A. H.
1987 *Vidal Great Kiva Site, LA 16254, Progress Report for 1986.* Albuquerque Archaeolgical Society, Albuquerque.

Sundt, William M. and Richard A. Bice
1989 *Tijeras Canyon Sites AS-10: Preliminary Report.* Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A., Sheila Brewer, Bettie Terry, Phyllis Davis, Gordon Page, Elizabeth Kelley, William Sundt and Joan Wilkes.
1990 *The Vidal Great Kiva Near Gallup, New Mexico*, Summary Status Report. Albuquerque Archaeological Society, Albuquerque.

King, Dudley W. and Richard A. Bice
1992 *Subfloor Channels in Prehistoric Ruins: Anasazi Region of the Southwest*. Albuquerque Archaeological Society, Albuquerque.

Olson, Nancy H. and Richard A. Bice, edited by Alan, M. Shalette
1995 *The Albuquerque Archaeological Society: the first Twenty-Five Years, 1966-1991*. Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A.
1997 *Field Guide to Mid-Rio Grande Pottery.* Technical Note No. 4. Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A.
1998 *Prehispanic Pueblo Pottery*, second edition, Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A., Phyllis S. Davis and William M. Sundt
1998 The AS-8 Pueblo and the Canada de las Milpas, a Pueblo III complex in North-Central New Mexico. Albuquerque Archaeological Society, Albuquerque.

Bice, Richard A., Phyllis S. Davis and William M. Sundt
2003 *AS-5, Indian Mining of Lead for Use in Rio Grande Glaze Paint*, Report of the AS-5 Bethsheba Project Near Cerillos, editedNew Mexico. Albuquerque Archaeological Society, Albuquerque.

SUBMISSIONS TO *POTTERY SOUTHWEST*

The availability of *Pottery Southwest* in electronic format creates opportunities for communicating with a wide audience in a sophisticated manner. Following is a brief list of some guidelines to follow in preparing submissions:

Style: Please adhere to the Society for American Archaeology's Style Guide or the Arizona State Museum Style Guide, Second Edition.

Author Information: Please include all the information you want in the publication.

Length of Paper: Major papers should be approximately 15 to 20 pages including bibliographies and endnotes. Inquiries and Updates as well as notices should be in the 500 to 1,500 word range. Comments and Responses are limited to no more than 4 pages (900 words) and must be submitted within six months of the publication date.

Page Set-up: Top, bottom, left and right margins must be 1 inch. Do not use any headers and footers in your submission. The preferred font and size is Times New Roman, 12 point. Figure labels should be in Times New Roman, 10 point. Paragraphs should be single space, right justified, 12 after. Please do not use the tab key, the enter key, or the space bar to line up text.

Spelling and Grammar: Please be certain to spell check and grammar check your work before submission. Authors are responsible for the accuracy of their work.

Images (number & pixels): Please limit all images to 640 x 480 pixels maximum in jpg. Images should be submitted as a separate file as well as within the document.

Inserts: Please do not import spreadsheets, pie charts, etc. from Excel into a Word document. They must be converted to a jpg to be inserted as a picture. Do not use text boxes.

Deadlines: The deadlines for each issue are as follows: Spring: March 15, Summer: May 15, Fall: August 15, Winter: November 15. Papers submitted after these dates may be considered for the following issue.

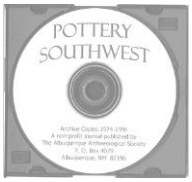
Returns or Rejections: *Pottery Southwest* reserves the right to reject or return for revision, any material submitted on the grounds of inappropriate subject matter or material of poor quality or of excessive length or if the material contains defamatory or otherwise illegal references. Manuscripts may also be returned for reformatting when they do not comply with the style provisions. Papers under consideration for publication elsewhere will not be accepted. Comments must be submitted no later than the deadline for the second subsequent issue.

Questions, comments, or inquiries should be sent to the editor at *psw@unm.edu*.

***Pottery Southwest* Copyright**: The Albuquerque Archaeological Society has held the copyright for *Pottery Southwest* since 1974. Standard copyright procedures apply, i.e., an author who contributes a paper to *Pottery Southwest* may distribute the paper in its entirety as long as he or she references *Pottery Southwest* as the source, i.e., *http://www.unm.edu/~psw/* and the volume reference. The same holds true for citations in bibliographies. The author may not offer the same article in its entirety to any other publication. Downloads of *Pottery Southwest* are offered free of charge. Thus, it is unrealistic for an author to assume to hold an individual copyright on a specific paper. Copyrights for individual photographs which are utilized to illustrate a point in the text and referenced therein as "figures," are part of the submission and are treated as such. Authors are responsible to ensure that material presented for publication does not infringe upon any copyright held be a third party.

ORDER FORMS

for POTTERY SOUTHWEST Vols. 1-23, 1974-1996 Archive CD
and/or Five Years in Cyberspace Archive CD Vols. 24-28



TO: Albuquerque Archaeological Society
P. O. Box 4029
Albuquerque, NM 87196

Number & Choice	**POTTERY SOUTHWEST CDs PLEASE PRINT CLEARLY**	**Price per CD**	**Total**
[____] Vol. 1-23 [____] Vol. 24-28	Name: _____ Address: _____ City: _____ State: _____ Zip Code: _____ E-Mail (optional): _____	$5.00 for AAS members and students $7.50 for non-members	
No. of Oppelt CDs	**PREHISTORIC SOUTHWESTERN POTTERY TYPES AND WARES by Norman Oppelt PLEASE PRINT CLEARLY**	**Price per CD**	
[____]	Name: _____ Address: _____ City: _____ State: _____ Zip Code: _____ E-Mail (optional): _____	$6.00 for AAS members & students, $7.50 for non-members plus $3.00 shipping & handling	
Number of AAS CD Sets	**Albuquerque Archaeological Society CDs Sets PLEASE PRINT CLEARLY**	**Price per CD Set of 2**	
[____]	Name: _____ Address: _____ City: _____ State: _____ Zip Code: _____ E-Mail (optional): _____	$15.00 shipping & handling included	
	AMOUNT ENCLOSED:		$_____