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MISSION STATEMENT

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CONTENTS

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POTS OF ETHNICITY?

David H. Snow

"Several ethnographic studies have suggested a correlation between ceramic construction techniques and social groups or "ethnicity"…thus it would be useful to examine this aspect in greater detail" (Geib 1996:117).

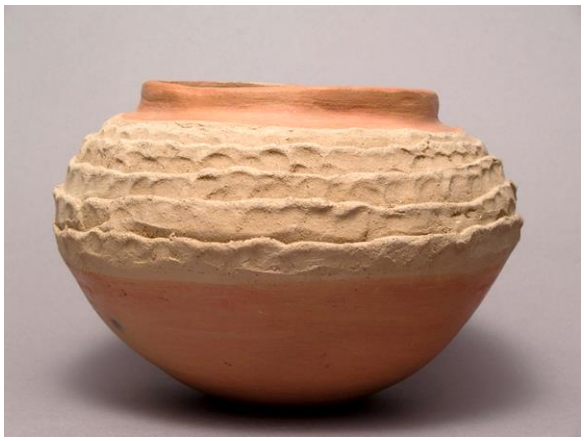

Figure 1a. Corrugated jar by Teresita Romero, Cochiti, ca.1950-1957. Photo and permission courtesy of the Museum of Indian Arts and Crafts, Museum of New Mexico.

Figure 1b. Corrugated jar by Norma Jean Ortiz, Acoma, ca. 1986-1991. Privately owned, photo and permission courtesy of Hayward H. Franklin

Abstract

Pueblo potters' vessel forming techniques, such as interior vs. exterior coil application, reflect learned behaviors that are passed down through generations and transmitted from place to place. Ethnographic and archaeological literature has occasionally suggested that such learned behavior reflects the practice of specific "ethnic" or other culturally defined socio-cultural entities. I review records of pottery production techniques and conclude that such generalizations are questionable at best, particularly if cited in support of wholesale migrations into the Northern Rio Grande from the Central Mesa Verde or adjacent Fremont cultures.

How to make a pot

Pueblo pottery, with few exceptions, is formed by the "coiling" method, a technique Kidder (Kidder and Shepard 1936:297-98) referred to as "ring-building," in which successive "ropes" or fillets of clay are pinched onto those below. The excess clay of each fillet is worked into the fabric of the vessel wall below it with fingers and thumb to obliterate the excess as the vessel's wall proceeds to the rim (Shepard 1961:58). There are but three ways in which to place a clay fillet ("coil") on the one below it in order to create the necessary bonding of the clay. It might be placed such that a portion overlaps equally on both the inside and outside surfaces of the fillet or coil beneath it, as reported for Ramah Navajo potters (Tschopik 1974:26; my

emphasis). Other Navajo potters, in contrast, were observed placing the initial fillet "on the inside edge of the basal portion [of the basal mold, or puki], a process continued until the vessel reached the desired height" (Hill 1937:13-14; my emphasis): all subsequent coils, then, overlapped on the interior of the vessel wall. Alternatively, the new fillet might be placed on the outside edge of the basal portion or preceding coil, such that subsequent fillets overlap on the exterior of the vessel wall, as Mera (1931:2-3) observed for Chupadero Black-on-white. This exterior overlapping clay provides the "excess" for creating the ubiquitous "corrugated" utility wares characteristic of the puebloan Southwest for centuries.

Figure 2. A Jicarilla Apache potter presses the excess clay from the fillet applied to the interior of the jar onto the one below with her thumb, as her fingers counteract the pressure on the vessel's exterior (Photo by Herb Dick c. mid-1980s, reprinted courtesy of SMU-Taos).

Corrugation, nevertheless, is a conventional misnomer for the shingled effect of Southwestern utility vessels often bearing exuberant textured surfaces facilitated by the excess clay of the overlapping coil on the exterior. I am not certain just when the term "corrugated" entered the vocabulary of Southwestern archaeologists, but I note that Cushing (1886:490) characterized the shingled effect created as "corrugations," a word defined in my Webster's as "folded or shaped into parallel ridges and furrows so as to form a wavy surface." Gifford (Gifford and Smith 1978:1) used the simile of the "clapboards on the walls of a house," the same effect provided by the shingles on the roof; but I doubt that shingled will ever replace corrugated in the literature of Southwestern ceramic studies! "Clapboard-corrugated" seems a contradiction in descriptive terms.

Krieger (1946**:**239, emphasis in the original) noted that prehistoric Southeastern Caddo area pottery exhibits coils "with seams slanting slightly downward toward the interior. Neck-banded jars he noted "were also coiled in this manner from the base to the rim-body junction," whereupon the potter switched her coil application technique, applying the "neck band" on the exterior. He continued, noting that "In the Southwest, on the other hand, I believe (though unable to find statements on the subject) that coiling very generally proceeded with the seams slanting toward the exterior…" (Krieger 1946:239, my emphasis; see McNutt, below p. 6). Aside from often quite detailed descriptions of the wide variety of decorative effects on Pueblo "corrugated" utility wares (e.g., Gifford and Smith 1978), Southwestern archaeologists, as Krieger noted, generally have paid scant attention to just how prehistoric Pueblo potters built other types of pots beyond noting that they were constructed by "coiling" (e.g., Blair and Blair 1999:132; but see Bell and Ferg 1990; Holmes 1886; Kidder and Shepard 1936:297-302; Wendorf 1953). Few have commented on (or perhaps even noticed) the ways in which the potter went about that task, beyond noting that "coils," "ropes," or "fillets" of clay were simply placed atop the one below until the rim was reached – *et voilá*, a coiled pot! Differences in how the fillet was applied to the one below, nevertheless, might reflect different learned habits that characterize the experience of individual potters, of specific potting lineages, or perhaps, of whole communities ("social groups") of potters. Coiled pottery characterized most of the pottery of Late Archaic, Early and Middle Woodland cultures (Griffen 1965:107, 109; Sanger 2016) through Mississippian Period cultures. The paddle and anvil technique is believed to characterize most prehistoric Plains ceramics, but the extent to which this might have been merely a "finishing" technique to obliterate coil junctures remains to be determined through the use of radiographic and computed tomography analysis.

Geib (1996:111-112) suggested that the specific forming techniques used by Fremont potters might provide useful information:

> During examination of Emery Gray from numerous sites throughout the Escalante River Basin, I consistently noticed that jars were apparently formed by adding coils that overlapped on the interior rather than the exterior…. Gunnerson (1959b:23) also observed this tendency. If coils were commonly overlapped on the vessel interiors rather than exteriors, this may represent a significant contrast with the Anasazi, who apparently overlapped coils on the exterior…. It is also worth mentioning that the absence of neck banding and true corrugation in San Rafael Fremont pottery is explicable if pots were formed by the interior overlapping of coils.

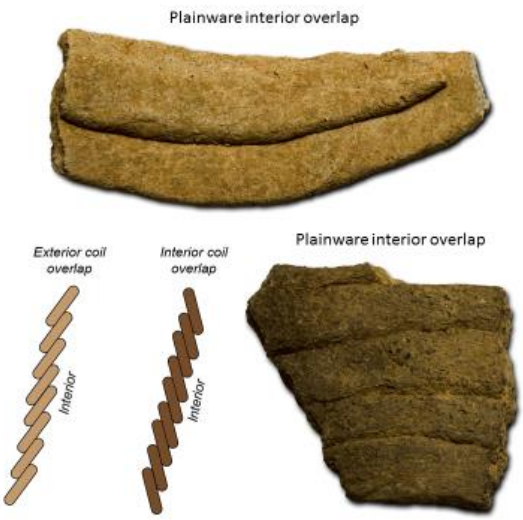

Figure 3. Interior coiling on Snake Valley Gray (Fremont) jars. Photo and permission courtesy of Scott Ure (see Hensler and Blinman 2005:376, Figure 22.5).

Krieger's description, however, indicates that the lack of Fremont neck banding is not necessarily "explicable," since application of the neck band might be independent of the primary coiling technique. Finally, Geib suggested (1996:117) that "apparent differences in the basic forming techniques of pottery are perhaps somewhat analogous to the well-documented differences in basketry foundations and stitch type between the Fremont and Anasazi noted by Adovasio (1971, 1980, 1986)." Adovasio's Fremont basketry studies, as Geib noted, certainly are suggestive. Adovasio (1979:729) pointed out that:

> Because it is an established fact (see Mason 1904, Weltfish 1932; Baumhoff 1957; Rozaire 1959; Adovasio 1977, 1978a; Adovasio and Gunn 1977) that basketry is probably the single most sensitive indicator of prehistoric or ethnographic cultural integrity in the artifactual record and, further, because no two unrelated prehistoric or ethnographic cultures ever produced exactly or even nearly the same kinds of basketry with the same range of constructional attributes, the definition of a distinctive Fremont basketry industry is at once a recognition and delineation of a Fremont cultural entity.

A brief ethnography of coiling a pot

How likely (or not) the techniques of forming a clay vessel might be a reflection of "ethnicity" or of specific social groups is an intriguing question that has been only cursorily examined by Southwestern archeologists. That "coiling" techniques differ among contemporary Pueblo potters has been noted by several investigators. Batkin (1987:18; my emphasis), for example, remarked upon a curious contemporary practice whose implications he said, "<u>are not clear</u>."

> Potters most often apply coils to the inside of a pot while building it. However, at least at Zia, coils are applied to the outside surface of previous coils. Dora Tse-Pe of San Ildefonso, daughter of Candelaria Gachupin of Zia, has explained that outside coiling is almost universal at Zia, although this approach is a matter of preference, because she [Tse-Pe] has always built her pots by adding coils to the inside (personal communication, 1986).

Ellis (1983:238) noted that of some eight contemporary Zia potters "the majority are from the Pino and the Gachupin families," but other potting families in Zia existed for which we have little or no information (Salas, Toribio, and Medina; see Batkin 1987:121-122). Dillingham (1992:56) noted that Acoma and Laguna "potters have distinct preferences…some placing the coils on the inside…others on the outside."

Santa Clara Pueblo native Anthony Chavarria (2008:5, my emphasis) nevertheless informs the reader that "in the Tewa region, coils are generally applied above and outside of each other," while Keresan potters, he says, "generally" apply their coils "above and inside of each other." Coil application and "ethnicity" clearly are implied here. Santo Domingo (Kewa) Keres potter Robert Tenorio nevertheless places successive fillets on the interior of a large bowl (Trimble 2004:15) following the "ancient traditional methods" of his family members (Tenorio 2005). Contrary to Chavarria's observation, Minnie Vigil, daughter of Santa Clara potter Petra Gutierrez, places the coil on the interior of a small bowl (Ward 1975**:**4). Famed Santa Clara potter, Margaret Tafoya also coiled her bowls, as well as an extraordinarily large, Ali Baba-sized, wide-mouth jar, with an inside coil overlap (Blair and Blair 1986**:**94, Fig 3.6; 96, Figure 3.9; 97, Figure 3.10, p. 99 Fig 3.11). Descriptions and photos of Santa Clara potter Helen Shupla clearly indicate that fillets were placed on the interior of a bowl being constructed (LeFree 1975:28, Figure 14, p. 32), while the same potter, making a restricted-mouth jar, places the last fillets so that the bulk overlaps on the exterior of the vessel wall. Bunzel (1972:7, my emphasis) claimed that at Zuni, "The strips [fillets of clay] are always placed inside the finished wall…". Goddard (1945:16, Figure 4), however, provided a photograph of a Zuni potter placing the coils for a jar on the exterior of the fillet beneath it, as does Hodge's (1910:297) illustration of a Zuni potter stooped over an exceptionally large jar in the process of being coiled, such that the overlap also is on the exterior. Hardin (1983:12-13, and Figure 15) reported "multiple building strategies" by Zuni potters, including both interior and exterior coiling for jars, and "slabs" of clay for rectangular vessels…".

Trimble (2004:13) quoted a Hopi-Tewa potter whose fillets, he says, are placed "along the inside edge" of the base of the vessel, and Colton (1953:Figure 1) provided a photograph of a woman from Sichomovi whose fillets overlap to the interior of the bowl, as does Nampeyo in a photograph (Blair and Blair 1999:76, Figure 2.18B). Similarly, Bell and Ferg (1990) discuss in considerable detail the construction of a canteen by a Walpi potter who was said to press excess clay of the fillet "down upon the inside of the bottle" (Bell and Ferg 1990:13), but a photograph of an Oraibi potter, taken in the latter part of the 19th century, shows the coils on the exterior of a jar (Blair and Blair 1999:124). A contemporary Hopi Tewa Village potter recently remarked to me that she coils "inside" for bowls and "outside" for jars. Additional Hopi Mesa "coiling" practices are not recorded (e.g., Stanislawski 1978; Wycoff 1985). I wonder if it is possible to

produce the very nearly flat-shouldered Sikyatki-style jars, so expertly copied by Nampeyo (e.g., Blair and Blair 1999, Color Portfolios L-R) with the inside coil overlap (see also Wade and McChesney 1981:29, see image No. 43-39-10/25093; Fewkes 1973, Plate CXXXV). Eric Blinman informed me (personal communication, 5/17/16) that a Hopi student in his pottery class found that creating a corrugated effect on his vessel was easy, apparently, because he had learned to apply coils overlapping on the exterior. In contrast, two Santa Clara women in the same class found exterior coiling to be quite awkward. Variations on the coil technique clearly vary with the potter's experience ("learning"), as well as on the intended vessel form.

Hensler and Blinman (2002:375-76) noted that "although the Colorado Plateau utility wares are almost uniformly constructed by applying coils to the jar exteriors, the plurality of Rio Grande P-IV utility wares is constructed by applying coils to the interior of the growing vessel." Their accompanying figure (2002:376, Figure 22.5) illustrates utility vessel rim-sherd profiles ("edge-on") showing the difference in exterior fillet overlap (identified as "Colorado Plateau, Anasazi") and interior overlap (for "Rio Grande and Fremont," alluding to Geib's observation; see Figure 3 above). Referring to the "minimalist" (their term) Rio Grande textured examples they note that they are "simply attempts to achieve surface texture with the interior coil application technique" (2002:375). Why such surface texturing might have been desirable or useful is not discussed.

"Minimalist" migrants?

Following Geib's comments, Hensler and Blinman suggest that the Fremont interior coil overlap is a "potential tool for dealing with the question of migration…" (2002:376); further fuel, perhaps, for the current controversy regarding the "origins" of Tanoan-speaking peoples of the upper Rio Grande Valley (Boyer et al. 2010; Lakatos 2007; Ortman 2012; Schillaci and Lakatos 2016). In addition, then, to the postulated migration of what are believed to have been several thousands of Mesa Verde migrants to the northern Rio Grande (Ortman 2012), the possibility of a significant migration from the Fremont regions adds an interesting dimension to this on-going debate. It is worth noting in this regard that mitochondrial DNA haplogroup B frequencies (83%) in a sample of prehistoric Fremont individuals from the Great Salt Lake wetlands are quite similar to those determined from Tanoan-speakers (86.1%) from Jemez and San Ildefonso Pueblos (Kaestle and Smith 2001:4, Table 2; Lorenz and Smith 1996). These are significantly higher percentages than those recorded for any other sampled pueblo populations. Kaestle and Smith (2001:10) further noted that the

> Prehistoric inhabitants of the western Great Basin, with a high frequency of haplogroup D, differed significantly from the ancient Fremont people of the eastern Great Basin who themselves resemble the ancient Anasazi, south of them and modern groups in the American Southwest (Carlyle, personal communication)

That a "plurality" of Rio Grande utility vessels was constructed by interior coil application, however, remains to be determined, although some of the utility types referred to apparently do reflect interior coiling (Fig. 4a-d; and see Wendorf 1953:57-58). The apparent

absence of such "minimalist" treatment on utility vessels in the greater Mesa Verde begs the question of why the posited overwhelming numbers of Mesa Verde migrants to the upper Rio Grande failed to carry with them and to reproduce their traditional forming techniques in their new homes. Similarly, it is not clear with what frequency either of the two coil application methods characterized utility wares across the Late Fremont region, ca. 900/1000-1300 (Scott Ure, personal communication, 5/19/17). Rex Madsen (1977) noted that gray ware pottery from the northern Fremont areas have incised and punched designs; and David Madsen (1986:207) stated that "true" corrugation in the Fremont occurs only in the Parowan subarea, while Salt Lake Gray, Sevier Gray, and Emery Gray are said to sometimes bear "false corrugations" (see Malouf 1946:119, Fig. 46). Allison (2010:132-133) noted that during the Pueblo III period in the Virgin region of the Fremont some forty percent (or more) of ceramic assemblages consist of corrugated pottery, although "the production of plain gray-wares did not cease." How the latter might have been coiled is not indicated (see Figure 2), but Parowan Fremont potters evidently used both techniques depending on their need (or desire?) for textured or plain exterior surfaces (Scott Ure, personal communication, June 6, 2017).

Figure 4a. Sapawe Micaceous Washboard vessel (66.105.19), from Sapawe Pueblo, illustrating the surface appearance of interior coil overlap. Courtesy of the Maxwell Museum of Anthropology Archives

Figure 4b. Interior of a Sapawe Micaceous Washboard vessel (2009.51.5), from Tsama Pueblo, showing the overlapping coils on the jar interior. Courtesy of Maxwell Museum of Anthropology Archives

Figure 4c. Blind-indented Corrugated vessel characteristic of upper Rio Grande Late Coalition Period utility wares. Photo and permission courtesy of Eric Blinman

Figure 4d. Smeared-indented corrugated vessel characteristic of upper Rio Grande Late Coalition Period utility wares. Photo and permission courtesy of Eric Blinman

David Madsen (1979:738, my emphasis) seemingly agreed with Adovasio (above, 1979:729), noting that the three general Fremont regions (Basin Sevier, Plateau, and "possible northern Plains-derived" manifestations) "probably shared common origins [and] languages…". To what extent current thinking about Fremont "ethnic" differences or *sameness* concurs with these opinions I am not aware. Talbot (2015:18) suggests the Fremont concept should be considered "a regional system, similar in many respects to Hohokam, Rio Grande, Kayenta, and others." Such regional *systems*, however, are not necessarily (or at all) "ethnic" entities.

The "false corrugations" noted by Madsen (above) are limited, for the most part, to the northern Fremont (Lane Richens, personal communication 7/7/17), and the visual effect of the punched or tooled surfaces, perhaps, might well resemble, superficially, the "minimalist" Rio Grande examples (Lane Richens, personal communication 6/23/17). Like the Parowan potters, small numbers of plain-surfaced utility vessels also continued to be made alongside corrugated varieties by Mesa Verde potters until late in the 13th century (e.g., Cattanach 1980:230; Hayes and Lancaster 1975:110, 112 Figure 103; Swannack 1969:63). No information is provided on coil overlap for these vessels, but they obviously lack the "minimalist" treatment of Rio Grande potters. In the upper Rio Grande, McNutt (1969:14, my emphasis) observed, that of the Pueblo II Neck-banded sherds recovered from the Tesuque By-pass Site, from "the whole collection of neck-banded sherds, only one indicates that coil overlap was on the inside going up the vessel." All other sherds showing termination of banding indicated that coil overlap was on the outside as Krieger noted for the Caddo Neck-banded types. Wiseman (1995:243) noted that some 54 percent of the utility sherds from the 12th century occupation at LA 835, near Pojoaque, New Mexico, "are plain-surfaced." Included, however, were several sherds bearing a "scratched" surface, as well as several Taos Incised sherds. LA 835 lies a short distance north of Santa Fe, on the east side of the Rio Grande. From the KP Site in downtown Santa Fe, Wiseman (1989:54) reported "a couple of large rim fragments and especially a large sherd from one rather small vessel… [that] indicate that at least a few totally plain-surfaced vessels were made." Pictured in Wiseman's report (1989:56, Figure 21) is an overall ("minimalist") indented corrugated jar that appears to have been produced by inside coil overlap technique. Radiocarbon and tree-ring cutting dates indicate occupation of the KP site from ca. A.D. 1000 to the first half of the 12th century. A similar example with what clearly is inside coiling is a "blind-indented" utility jar recovered from downtown Santa Fe from an area with subsequently reported Late Developmental Period remains. The vessel is illustrated on the cover of a 1928 El Palacio (XXIV/5) magazine. A "Taos Gray Corrugated" vessel (A.D. 1000-1200) from Pot Creek Pueblo quite clearly shows the exterior pattern resulting from interior coil overlap (Herold and Leubben 1968:50, Fig. 26e).

Textured surfaces on 13th century Rio Grande utility vessels feature smeared washboard and ribbed surfaces, as well as striated, incised, "tooled," and punctate patterns. Shallowly indented, or a washboard-like surface (Tesuque Smeared Indented), or with horizontal ribbing following the coils (Sapawe Micaceous Washboard), and similar "rubbed-ribbed" exterior surfaces are characteristic of several of these "minimalist" wares. Washboard surfaces reported on utility pottery, presumably, of Tewa manufacture, also are reported from 17th century Glaze

and Tewa matte paint deposits in downtown Santa Fe (Wiseman 1988:10). Surface textured varieties also occur in many earlier Rio Grande sites prior to and well beyond the present Tewa region of the upper Rio Grande Valley (e.g., Franklin and Murrell 2010:75, Table 2; Mera 1935). Early 13th century Saltbush Pueblo at Bandelier National Monument, for example, yielded 23% of the utility wares with plain (or striated) surfaces (Snow 1974). Kidder (Kidder and Shepard 1936:306) noted that a "considerable proportion" of the culinary sherds from 13th century Forked Lightning, southeast of Santa Fe, lacked any trace of corrugation, their surfaces varying from "decidedly rough, [to] others fairly even…". South of Santa Fe, fourteenth century Arroyo Hondo Pueblo (ca. A.D. 1315-1410) yielded a considerable range of exterior treatments on Rio Grande (or "Tesuque") Gray Ware varieties: some 23 variations of indented-corrugated, banded, and ribbed, all of them "smeared" (Habicht-Mauche 1993:16, Table 4, and Figure 21 for some of the varieties). In particular, her Figure 21a appears to have coils overlapping to the interior. If the estimated dating for these prehistoric upper Rio Grande utility varieties (900-1200, as per Wilson 2013:165) can be relied on, they tend to be significantly earlier than the proposed massive exodus from the Colorado Plateau or adjacent eastern Fremont in mid- to- late-13th century.

If Hensler and Blinman are correct about the predominant Rio Grande utility vessel coiling technique, we must seek further evidence, so far not apparent, for a significantly large and influential number of migrant Fremont potters to the Rio Grande. Lipe (2010:283-284) has suggested that migrants might be recognized within their "host populations" by retention of "visible" aspects of their ethnicity as a social strategy" (such as interior coiling?). Alternatively, should such migrants aim to "blend" with their host populations, visible ethnicity as a social strategy might not be evident. As for utility pottery, it is not clear why Mesa Verde migrants might have altered their utility ware techniques in order to "blend" in among as yet unidentified resident northern Rio Grande populations; nor why they might have adapted local decorative styles to conform with those of the resident production (e.g., Santa Fe and Wiyo Black-on-white pottery; Ortman 2011; see Wilson 2013).

It should be pointed out here that plain-surfaced coiled pottery also is reported from the Rocky Mountains and Front Range of eastern Colorado (Benedict 1985:131; Husted 1964; Irwin and Irwin 1959:82-83, Figure 60). Such plain wares also are reported from the Purgatoire River basin where Hummer (1989:332-349) identified seven different varieties of apparently coiled plain ware sherds (*not* paddle and anvil formed). Similar unidentified plain ware sherds are reported from sites across the Park Plateau and along the Cimarron drainage of northeastern New Mexico (e.g., Glassow 1980; Habicht-Mauche 1997:683-700). Plain polished ceramics, locally produced Sopris Gray, are reported from a Sopris phase site also in southeastern Colorado (A.D. 900/1000-1200; Mitchell 1997:164). Most of these latter tend to be identified as Taos (or Sopris) Gray varieties with or without surface embellishment. One such vessel from a Sopris Phase site is reported to have "coiling-cells obliterated but visible on interior…" (Wood and Bair 1980; 186). Gunnerson (2007:54; my emphasis) identified a partially restored "unidentified intrusive corrugated" jar from Chase Orchard pueblo, a Poñil Phase pueblo in northeastern New Mexico, with a "probable" dating of ca. 1100-1200 (Gunnerson 2007:93). Three rim sherds of his local "Taos" Gray examples from the site are illustrated in Figure 106, p. 54 (top right and bottom) and appear to have been formed with interior coil overlap.

With regard to the Taos district and points northeasterly across the Chaquaqua Plateau (the Las Vegas Plateau, Raton Mesa, and Park Plateau sub-sections; Campbell 1976:10), the number of "true" corrugated sherds reported can be counted on your fingers, with but slight exaggeration. The majority of Taos Gray sherds reported across the Chaquaqua Plateau either are plain, incised, or bear punctuate designs, and are little different from the slightly later 14th century "Tesuque Gray" varieties of the Rio Grande described by Habicht-Mauche (1993). Both the Sopris and Poñil Phases, although not firmly dated, apparently pre-date the majority exodus from the Fremont or from the greater Colorado Plateau regions. The Taos and Taos-like gray ware varieties identified in these reports are believed to reflect either an expansion of pueblo peoples from the Rio Grande, or pueblo influence on resident "indigenous" populations, as Baker (1964:15) suggested. Wendorf (1960:60) observed that

> These Pueblo-like sites occur over a wide area on the east side of the [Southern Rocky] mountains…and, at the moment, we cannot definitely rule out the possibility that they represent seasonal occupation from Taos. But those who are most familiar with the area are inclined to think that they were a local population who were strongly influenced by the Rio Grande Anasazi.

He noted that by 1300 A.D., or likely before this date, those peripheral Pueblo-like settlements were in the process of abandonment, the inhabitants, presumably, having migrated elsewhere. It certainly is possible that those settlements were occupied by "others", neither Mesa Verde nor Fremont peoples who, having become gradually adapted to Pueblo culture and life-styles, migrated into the Rio Grande Pueblo world. Based on his study of Northern Rio Grande painted pottery stylistic developments, Wilson (2013:166) concluded that ceramics do not appear to support the theory of Mesa Verde migrants into the northern Rio Grande. This is especially evident when utility styles are considered, as Hensler and Blinman observed.

Referring to the "minimalist textures" of post-1300 Rio Grande utility wares, Hensler and Blinman (2002:375) note that such textures "may or may not be as successful in conveying resistance to heat shock as the Colorado Plateau textures" (2002:375). Regardless of archaeologists' (etic) arguments for textured utility vessels as possibly superior to plain-surfaced jars (Hensler and Blinman 2002:374-376), one has to wonder why potters across the Pueblo Southwest "returned to the manufacture and use of plain-surfaced utility vessels in late prehistoric and early Historic times" (Wiseman 2014:207; Schachner 2006:131).

David Carey (2002:9-10) noted that "textured vessels heat much more slowly than smooth ones," most likely because of surface evaporation through the larger surface areas of textured vessels allowing a high rate of transpiration through the vessel walls (see Schiffer 1990:377). Transpiration was reduced in experiments cited in Young and Stone (1990:200) by coating the vessel interior with vegetable oil, perhaps a legacy continued at Picuris where the interior of their bean pots is coated with oil "to keep food from tasting so earthy" (Trimble 2004:33). Carey (2002:11) concluded that "textured ceramics do not make more efficient cooking vessels than smooth ones," but he did suggest that surface texturing (that is, "corrugations") slightly improves resistance to thermal shock over smoothed surfaced vessels (2002:67-69). To what extent such knowledge was part and parcel of the prehistoric potter/cook

is, perhaps, a matter of opinion, but possibly other factors played a larger role. I suspect the relatively rapid replacement of both exterior "corrugations" on utility wares and the near demise of black-on-white styles during the 14th and 15th centuries is a reflection of events of far greater consequence.

Coiling in prehistory

Hensler and Blinman (2002:376) remarked that Colorado Plateau "potters were adept at both coil application techniques, using interior coil application in bowl construction and exterior coil application on cooking jars" (Figure 5a). Clearly, so were potters elsewhere across the Pueblo Southwest adept, as the widespread distribution of painted bowls with exterior corrugation indicates. Holmes (1886:291) illustrated two unidentified black-on-white bowls with exterior coil overlap. One of them (Figure 5b), from the Parowan Fremont variant near St. George, Utah (ca. 1100-1250), most likely is Paragonah Coiled. The third (Figure 5c) is identified simply as "from Cibola." Similar corrugated and painted bowls are described for Mogollon Brown Ware (Colton and Hargrave 1937:45), Salado Red (p. 65), San Francisco Red (p. 49), Elden Corrugated (ibid. p. 64), Cloverdale Corrugated (Kidder and Cosgrave 1949), McDonald Corrugated (Colton and Hargrave 1937:61-62), Chevelon Corrugated Polychrome (Martin and Willis 1940), Cibecue Painted Corrugated (Mills et al 1999), Red Mesa Black-on-white (Dittert and Plog 1980:88, Figure 113; Vivian and Clendenen 1965:11), Wingate Corrugated (Mera 1934), and Showlow Polychrome (Hays-Gilpin and Hartesveldt 1998:159,160-161).

Figure 5a. Mancos Black-on-white bowl with corrugated exterior. ©2014 Crow Canyon Archaeological Center; Mark Montgomery, photographer; Vessel from Bureau of Land Management-Anasazi Heritage Center.

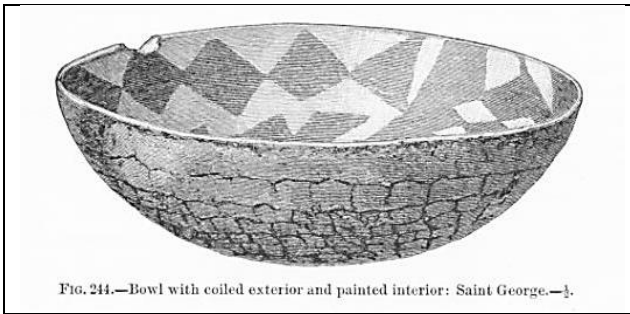

FIG. 244.—Bowl with coiled exterior and painted interior: Saint George.—$\frac{1}{3}$.

Figure 5b. Paragonah Coiled bowl with black-on-white interior (Western Fremont), illustrated in Holmes 1886:291, Figure 244.

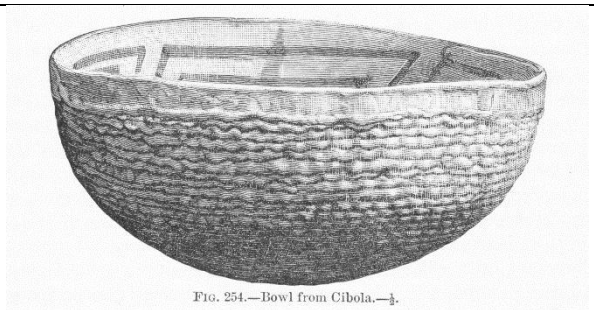

FIG. 254.—Bowl from Cibola.—$\frac{1}{3}$.

Figure 5c. Unidentified "Cibola" black-on-white bowl with exterior corrugations illustrated in Holmes 1886:297, Figure 254

Additional exterior corrugations on standard types include Chaco Black-on-white (Hawley 1950:44; one to three percent on Chaco Black-on-white bowls, Kari Schleher, personal communication, 11/28/16). A Socorro Black-on-white bowl sherd with exterior corrugations also is reported (Suzanne L. Eckert, personal communication, 7/20/17); and a recently reported Talpa Black-on-white bowl sherd exhibits a corrugated exterior (Valerie Bondura, Fort Burgwin Research Center, personal communication 8/18/17). Smeared-indented and ribbed-corrugated treatments also occur on some Santa Fe Black-on-white bowl sherds from Arroyo Hondo Pueblo (Habicht-Mauche 1993:21-22). Tusayan Black-on-white and Jeddito Black-on-orange bowl sherds with corrugated exteriors are reported from Awatovi's Western Mound (Smith 1971:576, Figure 186d, Figure 190b, c, e; 350), and Kurota (2016) has listed additional examples. Painted bowls with corrugated exteriors seemingly were not intended for use in the fireplace, but clearly were constructed in the same manner as contemporary corrugated utility jars with exterior coil application. Were these, perhaps, merely novelties, little more than a passing fad; might they have served a specific purpose, or reflected specific cultural or social "signals"? Is it possible (or likely), that some/many/all "regular" bowls of these types also were formed with the exterior overlap of the coils, the exteriors then smoothed over and the coils obliterated? Has anyone ever looked?

McElmo and Mesa Verde Black-on-white jars with corrugated necks are illustrated by Rohn (1971**:**182, Figure 211), Swannack (1969:82), and Cattanach (1980:193, Figure 182a-d) (see Figures 6a, 6b), but there is no indication of how the rest of these jars were constructed. I assume, however, that the process was no different than that described by Krieger (above) for Caddo neck-banded jars, in seeming contrast to McNutt's observation. Interestingly, Hayes and Lancaster (1975:108) described a Mancos Corrugated jar sherd from the Badger House Community at Mesa Verde that was built up "by applying the coil from the inside of the vessel so that the usual shingle or clapboard effect was reversed, that is, the lower coil overlapped the upper upon the exterior." Some Piedra through McElmo Black-on-white bowls from excavated Mesa Verde sites also exhibit exterior coiling (Figures 7a-c). Hayes (1964:55) reported a bowl and a jar of Piedra Black-on-white with "unobliterated bands as in Moccasin Gray" from the Wetherill Mesa survey. For Cortez Black-on-white, Hayes (1964:59, 60, 64) noted that three percent of bowl sherds bore a corrugated exterior, and 4.5 percent of Mancos Black-on-white

sherds similarly exhibited exterior corrugations, while three percent of Wetherhill Black-on-white bowl sherds also were so constructed. From Albert Porter Pueblo, some 100 Mancos Black-on-white sherds bear exterior corrugations, approximately 2.0% of the total Mancos collection (Kari Schleher, personal communication, 11/28/16). Excavations at Mesa Verde's Big Juniper House revealed 104 Mancos Black-on-white bowl sherds (including 51 rims) with corrugated exteriors, accounting for some 3.3 percent, "a slight decrease" from Cortez Black-on-white; and Swannack (1969**:**105-106, Figs. 91-93) noted two "plate" sherds (possibly pukis?), one each of Cortez and Mancos Black-on-white with exterior corrugations. Fifty-six Mancos Black-on-white and 22 McElmo Black-on-white bowls with corrugated exteriors also were recovered (Swannack 1969:78; and see Figure 73a for a McElmo Black-on-white bowl with exterior fillet overlap).

Figure 6a. Mesa Verde Black-on-white restricted-neck jar with corrugated neck from Big Juniper House, Mesa Verde National Park (Swannack 1969:82, Figure 58b)

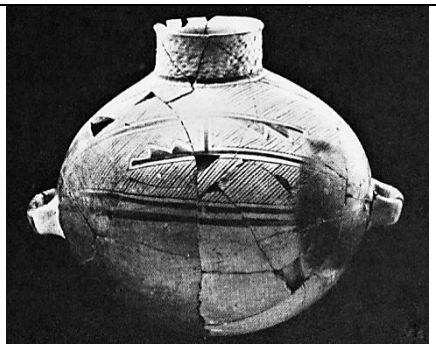

Figure 6b. Mesa Verde Black-on-white restricted-neck jar with corrugated neck from Mug House, Mesa Verde National Park (Rohn 1971:182, Figure 211e).

Figure 7a. Corrugated exterior on a Cortez Black-on-white bowl sherd from Big Juniper House, Mesa Verde National Park (Swannack 1969:106, Figure 93).

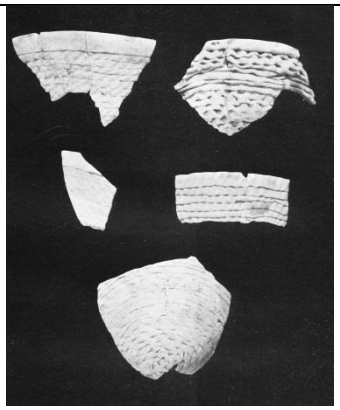

Figure 7b. Corrugated exterior on a Mancos Black-on-white bowl sherd from Big Juniper House, Mesa Verde National Park (Swannack 1969:79, Figure 55b).

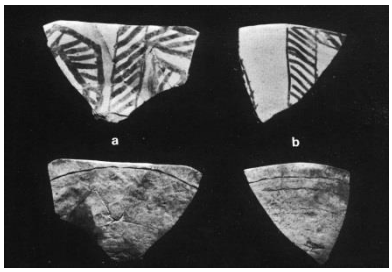

Figure 7c. Mancos Black-on-white bowl sherd with corrugated exterior from Big Juniper House, Mesa Verde National Park (Swannack 1969:105, Figure 92).

Hayes and Lancaster (1975:118), describing Cortez Black-on-white bowls at Badger House, noted, "Another method of treating the exterior of bowls is to leave the corrugations for decorative effect 2.5 percent of the bowl sherds…had such exteriors," and five percent of Mancos Black-on-white bowl sherds from Badger House refuse bore corrugated exteriors. Swannack identified five Mancos Black-on-white bowls with corrugated exteriors (1969:79 and 105; shown as Figures 7a-c, above), and he mentioned a possible effigy jar sherd "with the unusual feature of a corrugated interior" (1969:73). Hayes and Lancaster (1975:144, Figure 177) described a plain ware clay bowl "made in a basket tray with exterior coils visible." Cattanach (1980:171) identified a painted bowl with an un-indented corrugated exterior (1980:172, Figure 156), but was unable to determine whether it was McElmo or Mesa Verde Black-on-white. For Mesa Verde Black-on-white bowls, Hayes (1964:69) noted that "corrugated exterior very rare." Exterior coil overlap on bowls, however, did not cease with the abandonment of the Mesa Verde, and several such bowl sherds are reported on Rio Grande Glaze Ware varieties (Franklin et al. 2018, in press) (Figure 8).

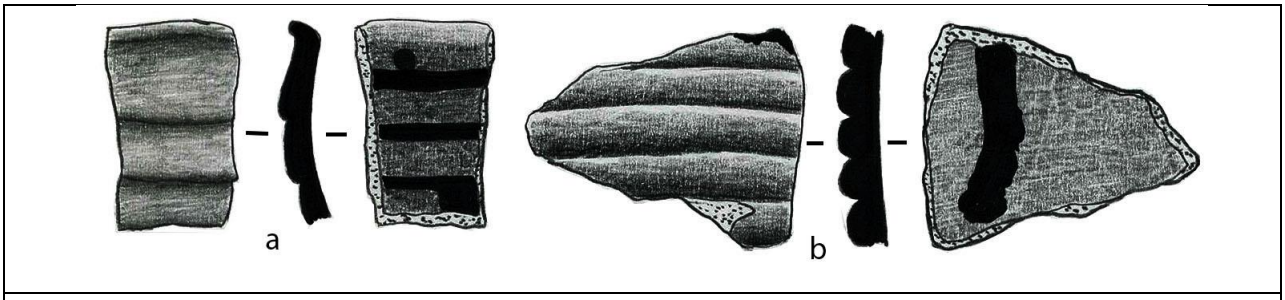

Figure 8. Sherds of Agua Fria Glaze/red from LA 421 (Alameda Pueblo) and Agua Fria Glaze/yellow from LA 22765 (Chamisal Pueblo). The sherd on the left clearly was fashioned by overlapping the coils on the exterior of the vessel; the sherd on the right, however, might have been made by interior coil overlap, leaving the coil exposed on the exterior and simply incising the junctures between the coils to accentuate them (photo and permission courtesy of Alexander Kurota; and see Kurota 2016:16).

Final thoughts

The recent debates over the population increase (beginning, perhaps, as early as ca. 1300) throughout the northern Rio Grande have focused, particularly, on the large Late Coalition and Classic Period pueblos in the vicinity of Santa Fe and northerly, especially, on the very large communities in the lower Chama River Basin (Duwe 2011; Habicht-Mauche 1993; Kidder 1958; Stubbs and Stallings 1953). The proposed influx of upwards of some 3000 to 4000 (or more) Mesa Verde migrants during the 13th century seemingly is buttressed by the dubious assumption that all the rooms in those very large pueblos were occupied *cumulatively* rather than *sequentially* (e.g., Duwe 2011:426-580; but see Creamer et al. 2002:68). Such an assumption ignores the weakening and/or collapse of old, unstable timbers, roofing and walls; it ignores groundfloor rooms as storage, and those abandoned as a result of death (and subsequent burial in them), as well as periodic out-migration of individuals or families resulting in abandoned sectors of the roomblocks. These and other factors likely resulted often in the addition of new rooms appended to older abandoned rooms or entire empty roomblocks. Absent definitive and substantial evidence for Mesa Verde, or Fremont migrants to the Northern Rio Grande Valley, I

suggest that other potential sources of migrant peoples into the region should also be given consideration.

The rather sudden appearance of many smaller aggregated communities up and down the west-facing foothills of the Sangre de Cristo Mountains north of Santa Fe in the Mid-to-Late Developmental period has been neglected by those who look to the greater Mesa Verde area (or to the Fremont) for the source of evident population increases in the Northern Rio Grande. New Mexico Historic Preservation Division ARMS files reveal a substantial number of small aggregated pueblos yielding Kwahe'e, Santa Fe, and Wiyo Black-on-white pottery (Skinner et.. al. 1980). Many, perhaps, most appear to have been abandoned prior to or at the onset of the subsequent production of Abiquiu Black-on-gray (Biscuit A), dating no earlier than about 1350. The majority of the large lower Chama Basin sites grew rapidly, however, during the production of the Biscuit Wares (A and B; e.g., Duwe 2011, Table D.3). The accompanying utility varieties in those smaller and earlier "foothill" sites, not surprisingly, are Hensler and Blinman's "minimalist" styles. Survey along the west-facing foothills of the mountains has been limited, however. Many, perhaps most of those sites clearly had their beginnings well prior to any suggestion of wholesale exodus of large Mesa Verde or of Fremont populations. Similarly, Developmental Period occupations in the Taos District (e.g., Herold and Leubben 1968:39) precede any significant migrants from the Colorado Plateau and, perhaps, also from the Fremont regions. Limited excavations at Tecolote Ruin, a short distance west of Las Vegas, New Mexico, yielded Red Mesa Black-on-white and early radiocarbon dates of 712 $\pm$ 13 and 923 $\pm$ 11 (Cabebe 2003), but the site was no longer occupied after ca. 1300. Lister (1948) described limited work at a small late 13th century "pueblo" site in the Mora Valley, and Bandelier (Lange and Riley 1966:182-183, 344 et seq.) described nearly obliterated small "pueblo" sites in the Gallinas River valley upstream of Las Vegas, New Mexico.

Whether these reflect Wendorf's (1960) proposed easterly expansion of Pueblo people out of the Rio Grande to peripheral locations, or their abandonment by "pueblo-ized" others prior to about 1300, remains to be investigated. These "Far Eastern" peripheral "pueblos" have been virtually neglected in the archaeological literature; many, perhaps most no longer exist as potential sources of in-migrating peoples to the adjacent Pueblo world they should not be ignored. That those unidentified peripheral peoples continued to adopt pueblo lifestyles and culture is likely and their ultimate remove to the Rio Grande Valley, for whatever reasons, is a reasonable conclusion. I suggest that a focus on migrants from the Colorado Plateau and adjacent Fremont regions late in the 13th century might not, in fact, account for the dominant Tanoan-speaking population of the late 13th century Northern Rio Grande. Clearly, peoples across the entire northern "edges" of the late Pueblo world left for other parts; that all, or even a majority of those former Fremont and Mesa Verde populations were responsible for populating the northern Rio Grande Valley, however, remains a controversial issue. Is it not just as reasonable to assume that some (all?) of those easterly peripheral populations also were "migrants" into the Northern Rio Grande? It is worth considering that they might reflect the last "contingent(s)" of an on-going process of adaptation to Pueblo culture and lifestyles of several centuries or more in duration, whatever their "ethnicity." This is *not*, of course, a new "theory" (see for example, Ford, et al. 1972:23; Hawley 1937; Trager 1967), although one long since abandoned by most Southwestern archaeologists.

A short distance up the Rio Nambe from Pojoaque Pueblo is the ruin called by the Tewa people, *ongwịpinge*, "pueblo in the middle of" the Tewa world. There, according to Tewa story, was "where all the Tewa first lived together after the Emergence and before they separated" (Parsons 1994:15, note 7; and not in the Lower Chama Basin). Bandelier (1892:84) was told that from this pueblo occurred the "division into two branches, of which the Tehuas became the northern and the Tanos the southern…" (for a related story see Snow 2017:196, Note 3). Another account, perhaps, details the process of "becoming" in Taos story: the Water People "came out. They were first fish. They came over the mountain streams to the Santa Fe River. Then they swam up the Rio Grande and up the Taos River to the Ranchos de Taos creek…" (Ellis 1962:37). Perhaps "fish-tail mountain" (Harrington 1916:349), among the Sangre de Cristo peaks east of Tesuque Pueblo, recalls that journey?

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Shamanism, Hallucinogenic Plants, and Prehistoric Ceramics:
Do hairy gods and echinate pots now tell their secret narrative to an unintended audience?

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Abstract

In part, this paper responds to Paul Kay's (2009) Pottery Southwest paper "Ancient Voices-murals and pots speak! *More prehistoric tales of Datura"* and his expressed desire that his work may stimulate others to continue investigation of the themes of his paper. An accumulating body of evidence supports Kay's ideas about the depiction of hawkmoths and *Datura* on Mimbres painted ceramics and the symbolic connections of this imagery with metamorphosis, transformation, transcendence and the entoptic state resulting from the use of hallucinogens. This paper will discuss 1) how shamanistic use of hallucinogenic plants and the entoptic state relate to trans-cultural symbol literacy in the Southwest and Mesoamerica, 2) how this symbolism is based on intrinsic human knowledge and empirical perceptions of the natural world, 3) how Kay's depiction of hawkmoths and their larvae extends to tobacco (*Nicotiana* species) and other sacred plants, and 4) why each pot's story is best understood by taking into account the full context of the narrative rather than focusing on the symbolism of individual motifs. The answer to the title's question is yes. Ancient pots speak to all who listen, transcending time and cultural boundaries by sharing with the original artists an innate, co-evolutionary connection with the natural world. Embedded in the stories ancient pots tell are details of cultural and biological significance. To paraphrase an old rubric, "the better one understands the biological and cultural contexts, the more the pots will reveal their tale."

Introduction

Paul Kay's 2009 Pottery Southwest paper "Ancient Voices-murals and pots speak! *More prehistoric tales of Datura*" makes an important contribution towards a better understanding of the link between prehistoric ceramic art and trans-cultural symbolism. For anyone reading Kay's paper it will be evident that his death prevented him from fully developing his ideas. Kay's paper focuses on symbols of metamorphosis, transcendence, emergence, and ancient shamanistic practices that are evidenced as symbolic elements of artistic expression. He links these concepts to the depiction of the hawkmoth/hornworm cycle on Southwestern painted pottery and in murals. Kay is the first scholar to draw attention to the symbolism associated with depictions of hawkmoth's *Datura* in prehistoric art. Kay's second unique contribution is his recognition of how religious symbolism expressed in ceramic art is related to the entoptic experience resulting from use of *Datura* and other hallucinogens. Berlant, VanPool, and Wynn (2017) greatly expand on Kay's work in their detailed and systematic analysis of *Datura* and Hawkmoth imagery in Mimbres painting.

Modern analysts and interpreters are not usually thought of as the intended audience of the symbolic stories told by ancient ceramic vessels. Even so, many researchers are drawn to this art form and offer erudite interpretations of the intended symbolism of the original artist. I

believe that while we may not seem to be the intended audience, the internal view of the original artists and their symbolic motifs are trans-cultural and on a basic level speak to our common human nature. Moreover, floral themes in religious art are common and widespread throughout the Americas (Hays-Gilpin and Hill 2008) and beginning as early as 10,000 B.P., shamanism based on the use of hallucinogenic plants was practiced widely (Adovasio and Fry 1976; Le Barre 1964, 1980). Other authors suggest there is a connection between the use of hallucinogens and trans-cultural symbol literacy was also widespread in the Americas (Furst 1974, Furst and Meyerhoff 1966). Religious symbolism is intricately bound with shamanism and the use of hallucinogenic plants (Le Barre 1964, 1980). Numerous hallucinogenic plants are utilized in shamanism and religious practice, of which the most common and widespread are Tobacco and *Datura* (Schultes and Hofmann 1980). Furst and Meyerhoff (1966) suggest that practices related to Peyote, *Datura*, Tobacco, Red Bean and other plants date to the Archaic and suggests that from these early practices widespread cults emerged. Le Barre (1980) points out that there is good evidence for this in the archaeological record of North America. Shamanistic use of hallucinogens has origins as early as 10,000 B.P. (Adovasio and Fry 1976; Merrrill 1977). Others have suggested that early prehistoric rock art was associated with shamanism and the use of hallucinogens (Boswick 2000, Wellman 1978).

Switzer (1972) suggests that beginning with the introduction of maize agriculture around 5000 B.P. there has been a succession of infusions of Mesoamerican religious concepts into the Southwest, resulting from regulated and unregulated diffusion, migration and colonization. Le Barre supports this idea and suggests that religions of agricultural societies of relatively more recent times "modified, over layered, or supplanted "shamanistic religions of earlier non-agricultural societies and that underlying beliefs in shamanism based on the use of hallucinogens have persisted" (Le Barre 1980). Other shamanistic cults emerged and spread, for example cults related to rain gods, plumed serpents, xipi (flower god-flayer/sacrificer) and possibly alcohol (Switzer 1972; Le Barre 1980). The nature of these cults and the way they spread may be analogous to the more recent origin and spread of historic religious cults such as Red Bean Cult of the Great Plains cultures (Merrill 1977) and peyotism of the Native American Church (Stewart 1979-80). It may be that a popular, dangerous and often fatal *Datura* cult was spawned by the publication Carlos Castaneda's *Teachings of Don Juan* (1969).

This paper begins by focusing on the accumulating evidence that supports Kay's ideas and suggest that over a wide area of the Americas prehistoric peoples have shared symbol literacy in their religious artistic expression. This is especially evident in the ceramics of the Ancient Pueblos and Ancient Mesoamerica. Here, I will discuss 1) how shamanistic use of hallucinogenic plants and the resulting entoptic state relate to trans-cultural symbol literacy in the Southwest and Mesoamerica, 2) how this symbolism is based on intrinsic human knowledge and empirical perceptions of the natural world, 3) how the depiction of hawkmoths and their larvae relates to other sacred plants, including tobacco (*Nicotiana* species), and 4) why each pot's story is best understood by taking into account the full context of the narrative rather than focusing on the symbolism of individual motifs.

Kay (2009) cites this author's hypothesis about *Datura* fruits effigy pots (Litzinger 1979, 1981). At the time these papers were published, I did not know that contemporary echinate pottery forms are, in recent and historic times, in use in Mesoamerica and the Southwest.

Lannon and Harlow (2008:322, Figures 20-23) present a photograph of a Zuni pot with spiked applique collected by M. C. Stevenson in 1881 and described it as a possible *Datura* fruit effigy. However, it is uncertain from the text whether or not this was Stevenson's description or Lannon and Harlow's. The vessel is described as a Polychrome Terraced Bowl. It is slipped white and painted with black and red, the tips of the echinate applique are painted black, the body of the bowl is covered with red dots. This vessel is remarkably similar to an echinate painted vessel with black paint on tips of the echinate applique and painted red dots described from Aztec Ruins, New Mexico (Aztec Ruins National Monument 2017). The Hohokam made similar echinate vessel described as *Datura* pod effigies (Evans and Lail 2015).

Lannon and Harlow report that "these singular vessels are only used in sacred ceremonial dances." The four-terrace bowls may also represent directional symbolism. Several similar bowls with echinate applique are illustrated by these authors with painted motifs virtually identical to the feathered serpent-moths, moth larvae and dragonflies on the Pottery Mound vessels described by Kay (2009). Also pictured on Zuni ceremonial pottery are wasps, tadpoles, and anthropomorphic horned toads. Another motif described by Lannon and Harlow is the "owl eye." This motif is often used for eyes of the plumed serpents with teeth, and of the horned toads depicted on Zuni Polychrome terraced bowls. Kay believed the owl eye motif is suggestive of the spiny form of the *Datura* fruit. Litzinger (1981) illustrates a ceramic stamp of a *Datura* fruit with the owl eye motif from Central Mexico. Patterson (1994) illustrates many of the same motifs on Hopi painted pottery. Identical "bull's eye" and "sun disk" motifs are well known in prehistoric Southwestern rock art hallucinogens (Boswick 2000, Wellman 1978).

Deal (1982) describes contemporary echinate ceramic forms in use among the Tzeltal Maya in the Chiapas, Mexico. These vessels serve as flower holders on altars in Catholic churches. Some opinions are that echinate ceramic forms in the Maya area represent the thorns of the young Ceiba tree (*Ceiba petandra*) (Zidar and Eisens 2009; Deal, with comments by Nicholas Helmuth, personal communication, 1982). This may be true for some vessels. However, the Tzeltal vessels and prehistoric vessels illustrated by Deal and prehistoric vessels illustrated by Zidar and Eisens (2009, figure 2c and 2d) look very much like the *Datura* fruit effigy vessels describe by this author in 1979 and 1981 and Kay in 2009.

In 1981, I began fieldwork for my dissertation at Naja, Chiapas Mexico (Litzinger 1983). I soon learned that the Lacandon Maya make several ceremonial "god pots" with echinate applique. These vessels represent anthropomorphic gods of the Lacandon pantheon (Bruce 1968). The pots are censers containing ancient spirit stones called *sastunoob*, which manifest the spirit companions of the gods they represent (Bruce 1968, 1979, 1997). These pots are treated as if they are alive. Copal is burned in them as ceremonial food. God pots are frequently offered tobacco in the form of cigars and ceremonial honey wine. Daily, they are supplicated to and entertained with songs and chants. The Naja Lacandon have the about thirty different pots representing the spirit companions of their anthropomorphic gods. Five of these have echinate

applique: 1) the pot of Sukumyum, the Lacandon Maya God of the Underworld of Xibalba (Figure 1). This is a bowl about 40 cm in diameter, 30 cm at the rim, and about 10 cm deep. It is slipped white and painted with black vertical striped black eyebrows. The face of Sukumyum is affixed to the rim of the bowl; 2) the pot of Ah Kak, God of War, creator of fire, the Sun God's sacrificial attendant (Figure 2). This unusual pot is about 18 cm in diameter, 13 at the rim, and the bowl about 10 cm deep. It is unique among the god pots because its head is attached to the rim of the bowl by its extended neck, with the head elevated about 2 cm above the rim. The head is about 4 cm in diameter. This pot is slipped with white and painted with black and red vertical stripes and dots. The head has prominent features; wide eyed, with mouth open, the arms of the god reaching back and grabbing the rim of the bowl. The hair on the god's head is painted red and black. The Lacandon say this is a depiction of the god's spirit companion, the male spider monkey. The echinate applique represents the hairy body of monkey God spirit. The vertical stripes represent the traditional tunic worn by Lacandon men. The black dots also represent hair. The red dots represent auto-sacrificial blood. During certain ceremonies the Lacandon painted dots made from the crushed fruit of annatto (*Bixia olaceeae*) on their tunics (Bruce 1979). The Lacandon say his facial expressions show he is joyous and intoxicated from smoking cigars and drinking *balche,* a ceremonial honey wine, 3) the pot of Ak Na, the wife of Ah Kak. This vessel is a handled censer, the bowl about 25 cm in diameter, about 20 cm at the rim and 10 cm deep. The vessel is slipped white and painted with red and black stripes and dots, but the stripes are horizontal and vertical, creating a hatched design that represents the traditional tunic worn by Lacandon women. Both bowl and handle have the echinate applique. The handle of the vessel extends from the base of the bowl directly below the head, with the head facing the handle. The handle is about 25 cm long and 4 cm in diameter. The Lacandon say the handle is the monkey's tail. The head is attached directly to the rim and has features similar to Ah Kak, representing the female Spider Monkey. The facial features of Ah Na are distorted and her head is attached to the vessel's rim at an awkward angle. She appears to be intoxicated. This vessel is used in new fire ceremonies during the god pot renewal cycle (for illustrations see Bruce 1997, figures 2 and 12). Ah Kak and Ah Na are the sacrificial attendants of the Sun God and Moon Goddess (Bruce 1968, 1979); 4) the pot of Kisin, and 5) the pot of Kisin's wife Xtabey. These pots are painted and slipped in the same manner and Ah Kak and Ah Na, but do not have distinctive facial features. Except for the echintae applique, these pots are virtually indistinguishable from the other god pots.

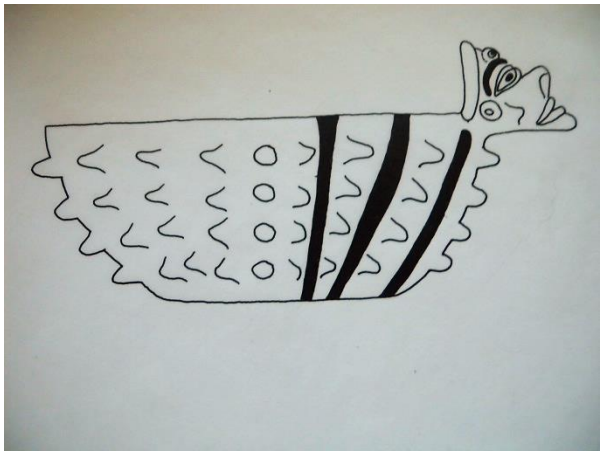

Figure 1.
Lacandon god pot of Sukumyum.
(drawing by the author)

Figure 2.
Lacandon god pot of Ah Kak.
(drawing by the author)

The image of Ak Kak and Sukumyum and Kisin were identified by Chan Kin Maax, elder member of the Naja Lacandon community in a number of illustrations of scenes depicted on ancient Maya painted vessels (personal communication, 1986). One scene, shown in Figure 3, is a in a roll out of the scene on a Maya painted cylinder illustrated by Coe (1973~~96~~), redrawn from Coe's original and adjusted to show the most prominent figure in the center of the scene. This central figure was identified by Chan Kin as Sukumyum, the "elder brother" of the sun god, and ruler of Xibalba. The third figure from the left he identifies as Ah Kak, God of War, creator of fire, attendant to the Sun God. The third is Kisin the God of War, and creator of the animal spirit companions of humans. Kisin accounts for two figures. In addition, there are four jaguars, two howler monkeys, one animal identified as a deer, and one humanoid figure. Chan Kin said this scene depicts the impending destruction of the world by the destroying jaguars that occurs every morning before dawn. Every night, the Sun God is decapitated and must be reincarnated before the next day begins. Sukumyum and Kisin must concur to Chan Kin saying that the main purpose of their ceremonial activity is to prevent the destruction of the world. If the Lacandon do not continue their ceremonial practice, the world will end.

Figure 3. *Datura wrightii*, Sacred *Datura*. (Drawing by the author)

Shamanism, Hallucinogens, Transcendence, and Trans-Cultural Experience

Among the many motifs described by Kay are depictions of "wild men with red hair." Kay suggests that these figures are in an ecstatic or entoptic state resulting from the ingestion of hallucinogens. I agree with Kay. These figures, with their raised hands and distorted facial features are depictions of involuntary behaviors often associated with using hallucinogens. Aldous Huxley (1954), in his quintessential book on the subject, *The Doors of Perception*, describes how hallucinogens elicit in the individual a transcendent experience of an altered reality. This is a conscious experience, not a dream state because the altered perceptions of things are not mistaken for reality. The experience combines an ecstatic state with altered auditory and visual perceptions of reality, along with entoptic or closed-eye visions. The entoptic state is accompanied by unmistakable involuntary postures and gesticulations.

Le Barre (1980) discusses how entoptic states can be achieved by fasting and sensory deprivation. Hallucinogens, Le Barre argues, provide a more immediate and perhaps less arduous pathway to ecstasy. Schultes and Hofman (1980) show photographs of shamans who have taken hallucinogens and are in entoptic states, with their arms raised and ecstatic expressions on their faces. Also, the photograph from Henry Wasson's article in Life Magazine *Seeking the Magic Mushroom* (1957:106-107) shows Maria Sabina, renowned "mushroom" shaman in Oaxaca, Mexico, with a "patient" in the entoptic state. Fernández (1959) recognized that the statue of *Xochipili* at the Museo Nacional de Anthropologia in Mexico City is depicted in the entoptic state. This imposing stone carving is a larger than life figure seated on a large carved stone pedestal. The figure's body and the pedestal are decorated with detailed,

botanically accurate carvings flowers. Wasson (1973~~7~~) identifies many of these flowers as hallucinogenic plants. In English, *Xochipili* means "flowers that inebriate." His wife, *Xochiquetzal* is the goddess of flowers in general. In Nahua cosmology, these deities are associated with the spring and the sun and the moon in the day sky. The fall flower deities are *Xipi Totec* and his wife. They are associated with the sun and moon in the night sky. *Xochipili* and *Xipi Totec* serve the sacrificial attendants of the principle Sun God and their wives serve as attendants to the Principal Moon Goddess. I believe it is more than coincidence that these *Nahua* Gods are the equivalent to the Lacandon Maya anthropomorphic gods Ah Kak and his wife Ah Na. This could explain why the Lacandon Maya God pot of Ah Kak has his raised hands poised ecstatic facial expression similar in appearance to Xochipili is intended to be depict him in the entoptic state (see Figure 2). Likewise the distorted facial features and odd angle of Ah Na's head may be intended to depict her in an intoxicated state.

Harner (1973) suggests that hallucinogen use and trans-cultural experiences are interconnected. Common trans-cultural themes are seeing snakes, jaguars, and other predatory animals, a sense of contact with a parallel mystic reality, a sense of flying and seeing distant places, people and things, a sense of clairvoyance, visions of spirit beings and demons. Naranjo (1973) confirmed this by conducting controlled experiments using hallucinogenic drugs and participants with different cultural backgrounds. He found that most participants had combinations of similar experiences, most notably visualizations of predatory animals, and a sense of the presence of spirit beings. However, some of his participants showed no signs of effects. Although his sample is small, Naranjo believes these common experiences could be latent images, genetically encoded memories embedded in our subconscious as a result of natural selection and evolution of the pre-human brain. It is well known that different hallucinogens have chemistry that affect the human brain in different ways, perhaps emphasizing some of the above phenomena more than others by mimicking different neurotransmitters in the brain (Schultes and Hofman 1980).

Datura use is associated with many of the above described states, particularly visions of snakes, predators, crawling things, visions of animal spirits, evil anthropomorphic beings, phantasmal monsters, a desire to fly, a sense of agitation and extreme alertness, a sense of being seized with madness, and loss of emotional and muscular control. More unusual states are having sense of transparency of the human body that allows one to see the bones and internal organs, and having overwhelming suicidal impulses. Alkaloids in *Datura* increase the intraocular pressure of the eye and can damage the retina, causing temporary or permanent blindness. *Datura* can cause convulsions, unconsciousness, and death from pulmonary arrest. Dangers of *Datura* use are well recognized by shamans who use or administer the plant to patients (Furst and Meyerhoff 1966).

Watching a *Datura* flower bloom is a mesmerizing experience noted by many poets and artists. The blooming cycle for a single flower is about 24 hours. On the day the flower begins to bloom, the bud begins to move to an upright position and the lobes of the unexpanded flower begin to swell. By early evening the spiraled tubular flower untwists. In a short time, the flower opens releasing an intoxicating fragrance. The release of this fragrance attracts the adult hawkmoth, which flying like a hummingbird, pollinates the plant with its long proboscis. By the

next morning the flower begins to droop and wilt. Consider the Oo'dham poem, first recorded in 1901 by Russel which refers to the *Manduca* moth on a *Datura* flower. Nabham (2000) provides a re-translation of the poem:

> "Sacred *datura* leaves, sacred *datura* leaves.
> Eating your young leaves intoxicates me,
> Making me stagger, dizzily leap.
> *Datura* blossoms, *datura* blossoms,
> Drinking your nectar intoxicates me,
> Making me stager, dizzily leap"

This phenomenon was first described by Grant and Grant (1965), who speculated about what biological or evolutionary benefit this could have. Hawkmoths pollinate several mesmerizing plants such as the Tuberose (*Polyanthes tuberosa),* the Four-o'clock (*Mirabilis multiflora*) and Tobacco (*Nicotiana* species). Hawkmoths pollinate the night blooming *Polianthes tuberosa,* the most sacred plant of the Lacandon Maya, which is described as having a "dazzling abundance of fragrance," causing momentary visions of ecstasy. The roots of *Mirabilis multiflora* are reported to contain a strong appetite suppressant, which may be why Hopi and Zuni medicine men chew the root to induce vision while making a diagnosis. Its leaves, called "red tobacco" are mixed with true tobacco and smoked.

The two of the most widely use hallucinogenic plants in the Southwest and Mesoamerica are *Datura* and Tobacco (*Nicotiana*) (Schultes and Hofman 1980). Other widely used hallucinogenic plants include peyote (*Lophophora williamsii),* morning glories (*Turbinia corymbrosa*, *Ipomaea* species), and mushrooms (*Psilocybin* species and others). Shamanistic and cultist manifestation of both *Datura* and Tobacco use are similar throughout the Southwest and Mesoamerica. Tobacco has long been recognized as hallucinogenic (Schultes and Hoffman 1980). Depending on the way it is consumed, concentrations of nicotine can vary, in turn varying in effect from a mild stimulant and appetite suppressant to a hallucinogen with effects similar in many respects to *Datura.* Tobacco contains a mixture of hallucinogenic alkaloids, including nicotine and dimethyltryptamine. These chemicals may be concentrated by preparation methods. Adams and others (2015) reports the Ancient Puebloans chewed tobacco-filled yucca-fiber quids, which may have enhanced the extraction of phytochemicals. Effects of tobacco may be accentuated by the use of admixtures of other plants with physiologically active chemicals. All traditional use of Tobacco and *Datura*, including medicinal use, is done in a ritual context or as an adjunct to shamanistic practices (Le Barre 1980). Tobacco and *Datura* were important ceremonial and medicinal plants among the Southwestern Pueblos and in Mesoamerica (Le Barre 1980; Furst and Meyerhoff 1966; Litzinger and Bruce 1989). Several closely related *Datura* species are native throughout most of the Southwest and Mesoamerica, including the Maya area where the genus has been erroneously reported as not occurring (Bye and Litzinger 1985~~4~~). There is ample ethnobotanical evidence for medicinal and ceremonial use of *Datura* among the Maya (Roys, Barrera-Martin et al. 1976; Litzinger 1994). Casagrande (2002~~0~~) states that *Datura*, along with as Tobacco, are the most powerful and dangerous medicinal plants of the Tzeltal Maya of Chiapas, Mexico. *Datura* flowers have been identified in Ancient Maya ceramic painted vessels, sculpture, murals, and prehistoric and historic codices (Litzinger and Bruce 1989; Kerr 2007).

DISCUSSION

New interpretations of Southwestern and Mesoamerica prehistoric ceramics and the interconnections between these vibrant and complex societies have emerged in recent years. Economic interchange between these areas was more extensive than previously thought. Important to this paper are the reports of Crown and Hurst (2009) and Washburn et al. (2011), that chocolate drinking was common and widespread among the Ancient Pueblos and a systematic interchange existed between the prehistoric Southwest and the tropical lowlands of Mesoamerican, possibly trading a commodity such as turquoise for chocolate. Throughout Mesoamerica chocolate is a sacred tree and chocolate was always consumed in a ritual context as a stimulant and mild hallucinogen. Chocolate was often mixed with other plants, which enhanced its stimulating effect (Bye and Linares 1990). It is hard to imagine that the ceremonial context of chocolate was lost upon its introduction into the Ancient Pueblo area, especially given that the Ancient Pueblos and the ancient cultures of Mesoamerica appear to share a common heritage of the shamanistic and religious use of hallucinogenic plants.

There are many kinds of evidence for a shared system of religious symbolism based on deep and ancient perceptions of nature among the Ancient Pueblos and Mesoamerica. For example, there are unambiguous parallels between the Hopi creation story told in the *Fourth World of the Hopi* (Courlander 1987) and the creation beliefs of the Quiche Maya told in the Popol Vuh (Tedlock 1985; Christenson 2007). Elements of religious beliefs co-occurring historically and prehistorically in the Southwest and Mesoamerica include; a) color/directional symbolism associated with rain gods and lightening and by extension agricultural cycles, b) mythic belief in multiple past worlds, including struggles of mythic twin gods, transformation, death, reincarnation, c) belief in ritual dualities such as day/night, good/evil, dream world/normal reality, d) belief in spirit beings or *nagual* associates of individuals and lineages, e) the practice of making sacred maize *tamales*, steam cooked in underground ovens as food for the gods, f) the practice of burning of the wood of sacred trees for ceremonial fires, g) shared practice of the shamanistic and ritual use of tobacco and *Datura*, h) shared beliefs in sacred trees and tree spirit beings, i) other shared sacred plants including species of *Yucca, Agave, Acacia, Mimosa, Tagetes, Argemone,* and reedgrass (*Phragmites austeralis*), j) the portrayal or impersonation of anthropomorphic deities with elaborate symbol laden visage, k) the use of sacred underground chambers (kivas of the southwest) or caves that connect to the underworld, l) closely shared concepts of origins of disease from sorcery and witchcraft and shamanistic healings based on the concept of "spirit cleansing," m) shared beliefs in sacred plant/animal associations, n) shared beliefs in the witchcraft or sorcery as a "dark path" associated with *Datura*, o) common belief that owls are associated with witchcraft and bad omens, and p) common to all are the cultivars, maize, beans, squash, cotton, bottle gourd, and amaranth, all of which are sacred plants.

Underlying assumptions of this paper includes 1) embedded in the artistic expression of prehistoric peoples is an intimate knowledge of the natural world and that there are details of this knowledge that can be identified and compared between cultures (after Nabham 2000), and 2) that entoptic states are connected to the origins of human artistic expression (after Lewis-Williams 2002). Prehistoric ceramic art, in particular painted vessels and ceramic sculpture, along with rock art, stone sculpture, murals, and in the case of Mesoamerican cultures, the

surviving prehistoric texts on ceramic vessels and codices, provide sources of durable and striking evidence for trans-cultural connections between the Southwest and Mesoamerica. Recent studies give more detail to help make these connections (Kidder 2009, Beukers 2013, Evans and Lail 2015).

Litzinger and Bruce (1989) examined the morphology of more than 100 plant species with religious and magic significance for the Maya and found they fall into one or more of the following categories; 1) plants with four- and five-parted flowers, tubular calyxes and corollas, and often with prominently exerted stamen, 2) plants with conspicuous hairs or spines, and 3) plants with actinomorphic multi-parted flowers showing a "sunburst" imagery. These floral forms are ubiquitous in ancient Mesoamerican art. Similar floral imagery is commonly seen in painted Southwestern ceramics. Litzinger and Bruce suggest that some natural forms may be associated with human death, concepts associated with the sun's nadir, underworld, night creatures, and malignant witchcraft. Other natural forms are associated with the sun's zenith, day creatures, rain gods, the directions, and color symbolism. When analyzing the function and interrelationships of religious symbolism of the Ancient Pueblos and Mesoamerica certain repeated patterns emerge. First, there is a sharing of fundamentally uniform symbolic floral motifs. Second, the echinate or spiny form is one of these. *Datura*, with its spiny capsules and dangers of use, appears to be a night/underworld symbol. Tobacco, on the other hand, with its viscid, reddish hairs is associated with day and upper world symbols. It is more of a stimulant and mild intoxicant. In their physical and psychological effects, both cause transforming and transcending experiences. The pollinator they share, the hawkmoth, does its work at the transition from day to night. The larva to moth motif is symbolic of metamorphosis, death and rebirth. In effect, there are probably multiple embedded symbolisms.

It is inherently difficult to ascribe a single explanation to a given observation or phenomenon. Yet, it is always tempting, when a trend or pattern seems to be evident, to make specific kinds of interpretations. Robert Rands (1953) recognized this in his study of the water lily in Maya art when he realized that there were many floral forms in Maya art and that some of the images he describes as water lilies may actually represent other plants. He saw water lilies everywhere he looked. This may be a common pitfall. Add to this the common belief in prior creations. For each prior world there may be different kinds of symbolism than the present stage of creation. Further, it must be considered that there are literally thousands of investigators of virtually every conceivable aspect of the prehistoric cultures of the Mesoamerica and the Southwest. The result is a vast published literature in a multitude of languages of which no single investigator is likely to be fully aware without considerable effort. As a consequence, multiple interpretations of the same phenomenon are common, arrived at independently by different investigators at different times and different places. The actuality is that for any given phenomenon related to religion and iconography there are multiple embedded symbolisms associated with natural forms depicted in ancient art.

CONCLUSIONS

1) Trans-cultural connections between the Southwest and Mesoamerica originated in archaic times early and developed shared symbolism of natural forms.

2) The depiction of intricately detailed and repeating patterns of form adhere to conventions of representation throughout Southwest and Mesoamerica.
3) Details of floral forms are sufficient for identification of plants known today as hallucinogenic.
4) Symbols are complex metaphoric devices; within cultures symbols are often intended for a specific audience, including shamans, initiates to cults.
5) Literacy of symbolism of some natural forms transcends cultural limits and may be intrinsic in humans.
6) More systematic approaches are needed, such as Beukers' 2013 study "The Maya Ceramic Book of Creation: The Trials of the Popol Vuh Hero Twins Displayed on Classic Maya Polychrome Painted Pottery."
7) The scenes on pots tell stories understood within individual cultures and possibly between the cultures of the Southwest and Mesoamerica.
8) I advocate the creation of a rubric for the analysis of symbolic assemblages. This means looking at the whole context and associations and assemblages of objects, beings, deities, plants, animals etc., in order to interpret the story being told. Partly, this would be based on artistic analysis of design, motifs and symbols, based on linguistic analysis of symbolic literacy, partly based on literary analysis of the story, identifications of personages, beings, deities, spirits, etc., partly based on morphological analysis of objects and identification of natural forms, and finally partly based on the effect on the intended audience.

Acknowledgments:

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Salado as a Technology
A New Perspective on Salado Polychrome

Andy Ward

Harold Gladwin coined the term "Salado" in 1930, using it to describe what he called a culture. Since that time archaeologists have disagreed about the definition of Salado: a culture, an ideology a phenomenon or something else? The true definition may be any or all of these, consider for a moment another point of view on this argument, that Salado is a technology. Patricia Crown in her book *Ceramics and Ideology: Salado Polychrome Pottery* argues that Salado is a regional cult, she makes that argument based almost entirely on the pottery produced across a broad swath of the southern Southwest (Crown 1994). *Archaeology Southwest*, in their fact-sheet entitled *Who or What is Salado?* calls Salado an ideology but uses pottery to track the spread of this ideology, it states: "based on the widespread distribution of Salado pottery, it seems that many Southwestern peoples participated in Salado in some way" (Archaeology Southwest 2013). One reason archaeologists are uncomfortable calling Salado a culture is because there is a great deal of cultural difference among Salado pueblos across the region. For example, some bury their dead while others cremate; it seems the one thing that links all these pueblos together is a particular group of pottery known as Roosevelt Redware. This type of pottery is technologically unique and unlike anything made in this region before. Petrographic analysis has proven that it was produced all across the region at almost every Salado pueblo (Crown 1994) and it shows remarkable consistency of design motifs, construction methods, firing methods, and vessel forms across the area in which it was produced from Phoenix to Silver City. When we look at Salado as a group of pueblos across a broad region with different cultural traits who are all making the same pottery, it is easy to see that while Salado may be a phenomenon, an ideology, and a regional cult, it is almost certainly also a technology.

Organic Paint Pottery

Organic paint was not a new technology when Salado polychromes were first developed but it was new to the region the Salado inhabited. Organic paint pottery first appeared in the four Corners region among the Ancestral Puebloans around 700 C.E. and was commonly used to produce Anasazi Black-on-white pottery (Figure 1). Firing organic paint pottery is a difficult technology to get right, with many potential failure points. In order for organic paint to become black designs on pottery, the firing atmosphere must be controlled to reduce the amount of oxygen available, too much oxidation and the organic paint burns away, too little oxidation and the pottery is left dark with carbon deposits marring the surface. Many modern day potters have spent years trying to perfect the ancient art of black-on-white organic paint pottery, take for example Clint Swink (Swink 2004) and Joshua Madalena (Roberts 2015). Given the complexity of firing organic paint pottery it is hard to imagine that this technology was developed independently in multiple places or that it was simply copied; more likely this technology spread from its point of origin as it was taught to other villages and groups. It follows then that organic paint pottery technology arrived in the southern Southwest by one of two

possible routes; either it was taught to them by a neighboring group or it arrived with immigrants.

Figure 1. Anasazi organic paint pottery, photo by the author, Chapin Mesa Archeological Museum

Oxidized Organic Paint Pottery

Around 1030 C.E., while the Ancestral Puebloans in the Four Corners region were producing beautiful black-on-white organic paint pottery, their cousins in the White Mountains were giving organic paint pottery a new twist. Black-on-white organic paint pottery is produced by smothering, keeping the oxygen away from the hot pottery; this results in a reducing or oxygen poor atmosphere (limited oxidation) that keeps the organic paint from burning out of the pots (Swink 1993). The hottest new style in pottery around 1000 C.E. was redware pottery, but in a smothered firing, the iron rich clays would not mature to the desired bright red color, so some innovative Cibola potter came up with a new way to fire organic paint pottery in an oxidizing atmosphere and *oxidized organic paint pottery* was born (Figure 2).

Figure 2. St. Johns Black-on-red replica made with organic paint, made by Clint Swink, photograph by the author.

Because the firing regime is so different, oxidized organic paint pottery was really a new technology, related to the old limited oxidation organic paint pottery technology but with an entirely different process. While limited oxidation organic paint pottery is fired in a trench or pit and smothered, oxidized organic paint pottery must be fired at least partially above ground to allow full oxidation of the red areas, this makes controlling the firing atmosphere more difficult. Oxidized organic paint technology existed in the White Mountains for over 200 years before Salado Polychrome showed up to the south.

The Clay Slip

Two things are needed to create organic paint pottery, the correct firing technique and the correct clay slip that will hold onto the organic paint. The specific type of clay used to turn organic paint black is called smectite clay; it is formed from eroded volcanic ash deposits and has unbelievable absorptive properties (they make kitty litter out of this type of clay). The original organic paint pottery, Anasazi black-on-white pottery, used a white smectite clay slip (Shepard 1956:34-35; Swink 2004:19). Organic painted White Mountain Redware was made using a red firing smectite clay slip. In order for oxidized organic paint pottery technology to spread beyond the White Mountains a smectite clay slip would need to be available to the potters in a neighboring region.

Sites in this region that are dated at the beginning or just before the appearance of Salado polychromes often contain a large percentage of White Mountain Redware (Carlson 1970, Clark 2001; Johnson and Thompson 1963). St. Johns Polychrome, a type that was frequently produced using oxidized organic paint technology, was in many ways the forerunner of Salado Polychrome. Widely traded across the Southwest just like Salado polychromes, it exists primary on bowls just like early Salado polychromes. It is common in many sites in the Salado heartland that date to the period just prior to the advent of Salado polychromes and oddly it stopped being produced around 1300 just as Salado polychromes were taking the Southwest by storm (Neuzil and Lyons 2005). As mentioned above, in order for oxidized organic paint technology to spread it either had to be taught to a new group of people or arrive with immigrants. In 1275 the southern Southwest was primed for the Salado phenomenon: they had access to neighbors with the expertise in this technology and they had a local demand for polychrome pottery, all they needed now was access to the right type of slip.

What about the Kayenta immigrants who are frequently cited as the source of organic paint technology used in Salado polychromes? It is true that the Kayenta made organic paint pottery in their homeland, but they did not make *oxidized* organic paint pottery, so it is probable that the Kayenta method of firing organic paint pottery would have been insufficient to produce Salado polychromes. Although it is obvious that the Kayenta had a hand in the development and spread of Salado polychromes and were familiar with organic paint pottery, oxidized organic paint pottery technology seems to have originated in the Cibola region and did not arrive in the southern Southwest with the immigrants unless they learned it during their sojourn through the White Mountains.

The Spark

Pinto Polychrome was the first of the Salado polychromes to appear. Before that, all oxidized organic paint pottery was made with a red smectite clay slip, but that didn't stop the creator of Pinto Polychrome from experimenting with other colors (Figure 3). There is an early Salado type called Pinto Black-on-red that is slipped red inside and out, but it was the new idea of putting white slip on the inside of the bowl while leaving the outside red that really wowed them. It is clear that Pinto Polychrome and Pinto Black-on-red were direct imitations of St. Johns Polychrome and St. Johns Black-on-red, the designs on Pinto are similar to those on St. Johns, and some Pinto bowls even have crude white designs painted on the outside of the bowl just like St. Johns Polychrome (Crown 1994:17). While Pinto Polychrome was the first Salado polychrome and set the precedent of using a white slip on oxidized organic paint pottery, it only existed for about 25 years and didn't spread as widely as its successor.

Figure 3. Pinto Polychrome bowl, photo by the author, Besh Ba Gowah Museum

The Inferno

Gila Polychrome came on the scene around 1300 and quickly displaced Pinto entirely (Figure 4). Visually it is obvious that Gila uses a different white slip than does Pinto (Crary et al. 2001), and it is possible that this slip had as much to do with the rapid and wide spread of Salado as any regional cult did. The hot-spot for Pinto Polychrome production seems to have been in the mountains north of the Salt River. Perhaps its remote location far from the major trade routes limited the availability of the Pinto slip to other villages, or maybe it was a small pocket of clay that was used up after 25 years of production and trade. Whatever the case, after 1300 the white slip used to make Pinto Polychrome quickly became an anachronism and the rather grittier, less polished slip used for Gila Polychrome became the thing that propelled Salado across the southern Southwest like a wildfire.

Figure 4. Gila Polychrome bowl, photo by the author, Besh Ba Gowah Museum

Patrick Lyons had this to say about the relationship between Pinto and Gila Polychromes, "banding lines and line-breaks are another interesting topic. Their absence on Pinto Black-on-Red and Pinto Polychrome and their appearance on Gila Polychrome and Tonto Polychrome seem problematic at first, perhaps indicating different origins for these types" (Lyons 2003). Although he goes on to argue that this is not the case, I contend that the evidence for Gila being of a different source than Pinto is strong. Because Gila Polychrome is made with different materials, different painting style, and different design motifs, it seems logical to conclude that it originated in a different location with different cultural roots. While Pinto Polychrome was obviously imitating St. Johns with locally available materials, Gila was imitating Pinto, combining the technology and colors of Pinto with design motifs, painting styles, and materials from a different area (Crary et al. 2001). This group that originated Gila was obviously more connected to the trade routes, which allowed the slip material, the pots, the technology and ideas associated with them to spread quickly and far. The type termed "Pinto-Gila Polychrome" rather than being a missing link of evolution between the two types is more likely the result of people combining elements from the two popular types during that brief period when both types were being made. Gila Polychrome was the perfect storm of supply and demand. Pinto Polychrome provided the impetus for the type and created a market for this kind of pottery; however, it was unable to fulfill that demand. Gila Polychrome came along and fulfilled the demand with a near limitless supply of white slip; this technology spread across the southern Southwest.

Although Salado may have been affiliated with an ideology, a phenomenon or even a culture (Crown 1994), it was as much about a new technology as anything else; market demand and trade routes helped to propel it across this region.

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Reports and Announcements

Southwest Symposium: January 5-7, 2018

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

The theme of the 16th Biennial Southwest Symposium is "Pushing Boundaries." In it, we hope to push geographic, theoretical, temporal, practical, and conceptual boundaries. In four invited paper sessions, the Symposium will explore 1) the formation and meaning of Bears Ears National Monument, 2) new research in chronology and chronometry, 3) Plains-Pueblo interactions, and 4) new developments in museum archaeology and collections-based research.

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 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

Society for Economic Anthropology Annual Meeting: March 1-3, 2018

2018 Society for Economic Anthropology Annual Meeting on "Water & Economy" will be held at Arizona State University, Tempe, AZ on March 1-3, 2018. The theme of this Society for Economic Anthropology conference will be on exploring the role of water in human economic life - from studies of water management in ancient societies, to irrigation in agrarian settings, to informal economies of water in squatter settlements, to social movements to secure a human right to water. For more information, see http://econanthro.org/meetings/2018-sea-annual-meeting/

March 14, 2018: Optional Field Trip: The SEA Conference will offer an opportunity to learn more about Hohokam lifeways and water management in a private fieldtrip to the Deer Valley Petroglyph Preserve and the Pueblo Grande Museum & Archaeological Park, both located in the Phoenix metropolitan region. The field trip will be organized by faculty members of Arizona State University's Archaeology program.

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CONTENTS

Bice, Richard A. and William L. Sundt
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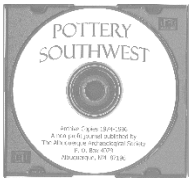

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