

Hopi Pottery in the Southern Utah Canyon Country

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New Results from a Long-lived Study in SE Utah

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Introduction: The Discovery of the Dansdill Collection

On November 21, 2002 a rare collection of ceramic pots and other artifacts was returned to Canyonlands National Park after an absence of nearly 40 years. The entire collection consists of five ceramic vessels, four ceramic sherds, two whole gourds, five half gourds, and juniper bark and a corn cob originally found in one of the vessels. These artifacts, along with 3 pots and 1 gourd that were parted from the collection when it was found, were originally discovered and collected by former Moab resident Alice (McKinney) Dansdill on June 8, 1963 in an area that would soon become the Needles District of Canyonlands National Park. It had always been Mrs. Dansdill's desire that the collection of pots and gourds be returned to the area for placement in a Canyonlands museum. Mrs. Dansdill died in 1998 and her wishes came to fruition when her second husband, Mr. Bob Dansdill of Aurora, Colorado delivered the collection to National Park Service (NPS) Southeast Utah Group (SEUG) headquarters in Moab.

Mrs. Dansdill and her first husband, Louis T. "Mac" McKinney, were living in a trailer near Cave Spring in ca. 1960-61 while working as caretakers in the Needles area, of what would later be Canyonlands National Park. The McKinneys worked at other park service units, including Arches and Chaco Canyon, and had spent time in the Moab area living in Castle Valley and at the Horsethief Ranch near the current-day Island-in-the-Sky unit of Canyonlands. According to a former NPS Ranger, this husband and wife team fenced much of the northwest boundary of Arches in 1965 (Don Follows letter to NPS dated 3/1/2002).

The McKinneys were joined by another local family who also had ties with the NPS, the Maberrys, on a camping trip in the Needles area in the summer of 1963. The trip was chronicled by Juanita (Janet) Mabery in a journal that detailed the trip, and by Slim Mabery, who noted sites on a topo map. The journal and map would prove invaluable to NPS archaeologists in determining provenience of

the artifacts, and in locating the site on a visit to the area in 2009. The following is an excerpt from the journal:

Just a short ways up this fork we spotted indian ruins so stopped to explore them.... Alice McKinney decided to scout around a bit. Mac pointed out a cave that Alice went to and found nothing. Going on around from the ruins from the cave, Alice found a beautiful large arrowhead. About 10 feet on farther she noticed a rock placed up against the wall that didn't look natural. She peered in behind it and saw an indian pot! Grabbing the rock, she pulled it loose to reveal 8 indian pots and some gourds! She was almost weak with excitement. She called Mac to see them and then Mike came.... By the time I got there everyone except Slim had come to see them. I will never know a thrill like seeing those pots in the cave just as some indian family left them at least 700 years ago....Slim took pictures before anything was touched. ..Lifting the pots out, we discovered one pot had 6 gourd spoons in it. There was also two other whole gourds. One of the pots had a pot turned upside down on it to protect potash salt placed in it. This is a fabulous find!

The McKinney and Mabery families shared information about the cache with Lloyd Pierson, an archaeologist working with the NPS at Arches and Canyonlands National Park in the late 1950s and early 1960s. Lloyd was familiar with salt analysis projects elsewhere in the region, as published by Walter Taylor (1954) and Robert Euler (1954), and was hopeful that someday analysis of the salt contained in the pot would occur. He shared these thoughts later in 2003 with the SEUG curator, after the collection was donated to the NPS by Mr. Bob Dansdill.

The Dansdill Collection is Returned to the Park

When Mr. Dansdill first contacted the NPS, agency archaeologists, namely Adrienne Anderson, Eric Brunneman, and Chris Goetze, began compiling information from a variety of sources regarding the cache's provenience, the type of pottery represented in the collection, and also assessed the research value of the collection to include chronometric, comparative salt analysis, and possibly pollen data. When they were satisfied that the collection did indeed possess context and its provenience was a site on NPS lands, they accepted the collection from Mr. Dansdill, who subsequently transported the collection from his home in the Denver area to Moab. After a brief ceremony and further information gathering, the collection was prepared for curation at the SEUG facility, where it resides today. Members of the Mabery family have also been involved in supplying information, photos, and copies of their maps and the journal recounting the find.

At the request of Chris Goetze, Dr. Richard Grauch of the USGS conducted a preliminary analysis of the salt contained in one of the pots (CANY 37894) in 2003. He found that the sample was readily divisible into two visually distinct categories: (1) “clean” white salt and (2) mixed red and white salt. The “clean” salt can be further divided (under a binocular microscope) into 2 subgroups: (1a) opaque white salt and (1b) a mix of translucent white and clear salt. He concluded that the sample was not very distinctive and had undergone alteration (mixing with sulfates). The alteration probably occurred in the pot as the result of some moisture dropping or condensing on the sample (although the source of the sulfur is not explained in the latter situation).

NPS archaeologists were able to relocate the cache site in 2009 using Juanita Mabery’s journal entries and family photos. A reconnaissance of the area revealed no other artifacts or features at the rockshelter. However, numerous prehistoric sites are located in the vicinity that contain architecture, lithic and ceramic artifacts, corn cobs, and rock art panels.

Analysis of the Dansdill Collection

Recently, the NPS has had the opportunity to move forward on studies pertaining to the cache. On September 15, 2010, Kelley Hays-Gilpin examined the pottery and gourd collection at the SEUG headquarters in Moab, Utah. She determined that the pottery appears to date to the same time period, sometime between AD 1450 and 1629, and to come from the same source, the Hopi Mesas.

Specifically, the pottery is typed as Jeddito Yellow Ware (decorated) and Awatovi Yellow Ware (utility). The styles and shapes of the pots are of a later style than those found at ca. 1300s sites (e.g. Homol’ovi) and are similar to those in the later levels at sites like Awat’ovi and Kawayka’a on Antelope Mesa (eastern edge of the Hopi reservation). The pots exhibit none of the characteristics typical of Spanish mission-period or later pottery.

The pots show some use wear, and evidence that the utility ware jars were apparently used for cooking. Hays-Gilpin (2010) notes that the pots are in remarkably good condition for having been carried so far from their point of origin on the Hopi mesas. She concludes that the assemblage looks like a household culinary kit, consisting of bowls for serving, utility jars for cooking, a small jar for drinking or serving liquids, a small gourd canteen, and dippers.

Hays-Gilpin (2010) theorizes that the act of caching the pots together, with one bowl filled with salt, suggests a planned return to a campsite. An alternate theory is that the cache served as a ritual

offering. She believes that there is a strong possibility that the cache represents a Hopi return migration or pilgrimage to an ancestral place. She adds that it is “also possible that the vessels were traded from the Hopi Mesas to non-Hopi people, such as Paiutes, who then carried them to the Canyonlands area”. The following narrative describing the artifacts found at the cache site are derived from Hays-Gipin’s 2010 letter report.

Hopi Pottery

CANY 37892 is a Jeddito Tooled jar with a pattern of oblique triangular punctates from the neck to just below the shoulder. It measures about 22 cm high, 28 cm in diameter, and orifice diameter is about 18 cm. The round base is plain as is the strongly everted rim, which lacks a rim coil/fillet. The rim exhibits a few chipped areas. The vessel has a low pointed shoulder. The vessel has a dark yellow surface, and light yellow core is visible where spalling is present. Temper is a medium to coarse quartz sand, subrounded, mostly milky, with red angular and grainy inclusions. The temper protrudes on the interior surface and exterior surface where not punched. The exterior surface shows some salt spalling. Overall, the vessel exhibits little abrasion, and all indications suggest that it was not heavily used. The presence of some brown streaks on the interior base seem to be from initial smoothing of the surface, then absorption of carbon, but could be paint streaks. There are a few fire clouds on the interior surface, the upper part of the exterior, and sooting is present on the neck and shoulder, but not on the base. Soot has accumulated in the neck area.

CANY 37893 is a Jeddito Corrugated jar, measuring 16.5 cm tall, 25.5 cm in diameter, and about 7 mm wall thickness, measured at the rim. The paste is hard and yellow in color, however, the surface is orange except for the sooted areas. The temper is a medium to coarse subrounded, milky-colored quartz, with red angular and rounded fragments, and it protrudes on the smoothed interior surface. The top rim coil, or fillet, is 9.4 mm in diameter, which is narrower than most rim fillets of pots of this type that date to the 1300s. According to Hays-Gilpin (2010), “Not enough study of post-1400 Hopi utility ware has been done to determine whether narrower fillets are more frequent in the 1400s or later”.

Moving down the vessel to the neck, the vessel has two plain coils measuring 4 and 8 mm wide. Below that, all of the coils are indented. Overall, the vessel is constructed using 2 coils per cm, or 6-7 coils per 4 cm window, with 4 indentations per 4 cm window. Indentation orientation is oblique, which is typical of the Kayenta and Hopi traditions (as opposed to vertically aligned Mogollon and Salado

corrugations). The vessel profile has a low, pointed shoulder as opposed to a globular shape, which would be typical of the 1300s or earlier.

The jar exhibits “salt blowing” on one side of the shoulder. The upper shoulder surface is sooted and the base is oxidized a reddish hue, suggesting that the vessel was used for cooking. Some fire clouds are noted on the interior.

CANY 37894 is a late style Sikyatki Polychrome bowl. Black and red and black spattered paint is visible on the yellow interior, and the pot has a black and red exterior. It is constructed from a hard, fine, dense paste that is typical of Jeddito Yellow Ware (Hopi Mesa iron-poor Cretaceous clays fired with coal). An examination of breaks reveals no visible temper, but very fine quartz and red particles are visible at 10-15x magnification. These types of inclusions are common in Jeddito Yellow Ware given the source clays of the Hopi Mesas.

The size and shape conform well with the known range for Sikyatki Polychrome. Hays-Gilpin (2010) notes that “The S-shaped rim is characteristic of bowls that date after about AD 1450 in the Hopi and Rio Grande areas”.

The design layout includes a broad banding line with a deliberate break, a spattered paint zone, a thin framing line, and a central geometric design consisting of two rotated rectilinear design units. The fill of one unit is red, and the other unit is filled with a pattern of hatchure and corbelled lines. Previous research on Hopi pottery conducted at the Arizona State Museum indicates that the dimensions of banding and framing lines are temporally significant, with banding lines dropping lower from the rim over time, and the space between banding and framing lines increasing at the same time.

The design on the interior surface of the pot consists of an L-shaped red-filled space with black outline, taking up 1/3 of the design field. This is opposite to a corbel-and-hatch-filled hook. The central third of the design consists of a broad black line, and line hook with inset triangle and small stepped element. The rim is painted with a corbelled/fine zigzag line. Rims of Sikyatki Polychrome pots are rarely painted. Therefore, the presence of a painted rim on this specimen suggests a late (post-1450) date for this vessel .

The exterior surface design consists of banding lines (measuring 10-13 mm) located above and below a continuous band of black and red broad lines, keys (half terraces), and winged hooks. A line break is seen on the lower banding line. The upper banding line is damaged by salt blowing, and no

break is visible. The breadth and complexity of the exterior design is characteristic of Sikyatki Polychrome from the late AD 1400s or 1500s. The exterior design is more precisely rendered than the interior design, suggesting different individuals painted the surfaces, a frequent pattern for Jeddito Yellow Ware across all time periods. The red paint is somewhat watery and irregular. The black paint is solid and well-rendered.

Red paint always touches black paint in both interior and exterior designs, a feature that is significant because very late examples of Sikyatki Polychrome and contemporaneous Zuni types (Matsaki Polychrome) sometimes have red elements that are not outlined with black.

This bowl was found filled with salt that has affected its condition. Small pot-lid fractures and chips on one side and the interior of the pot have likely been caused by the growth of salt crystals. The bowl has very little abrasion on its exterior base, and just a few scratches. There is no apparent rim chipping apart from salt blowing. It appears not to have been heavily used prior to being filled with salt and cached.

CANY 37895 is a Sikyatki Polychrome bowl that measures 23 cm diameter by 8.9 cm high, and has a wall thickness of about 7 mm. The rim profile shows a tapering lip that is thickened to form an interior ridge, a rounded shoulder, and a somewhat tapered, not pointed, base. This profile is characteristic of Sikyatki Polychrome (post-dates 1400 A.D.). The paste is fine; there is no clean break for viewing temper. The design configuration has a closely-spaced banding and framing line. An engraving and dry-brush technique is used in a combination curvilinear-rectilinear late Sikyatki-style (post-1450) design.

The interior surface design is comprised of a T-shaped central element with curved pointed 'wings' topped by bird/tassel elements with dry brush feathering to one side. Most of this design is rendered in light brown paint. The red paint used to fill in the elements that look like bird wings has mostly worn or flaked away. The surface of the vessel was apparently first engraved with fine geometric patterns, then painted so that the paint is darker in the engraved troughs. The top of the T shape has an engraved grid of rectangles, two deep, with fill that alternates between three small circles and an oblique zigzag line. The other segments of the T shape have rectangles filled with oblique zigzag lines, except the rectangles engraved in the lower right segment and base segment, which appear to have no fill. The interior surface has a brownish stain (possibly from pooling liquid?).

The exterior surface design has dense, evenly-applied, dark brown paint. The lower framing line encircles the vessel. Two opposed rectilinear geometric elements sit atop the framing line. This exterior

surface design is more precisely painted than the interior surface design, again suggesting different individuals painted the two surfaces. The exterior surface shows small areas of lighter paste with dark yellow on top (layered). This may be a self-slip that is spalling or some kind of mineral deposits (weathering rind). There are also some white deposits on the shoulder area.

The rim evidences some chipping, there is very little abrasion on the base exterior, and not much abrasion on the interior.

CANY 37926 is a small Sikyatki Polychrome jar manufactured of a very fine yellow paste with abundant very fine sand and red angular fragments. It has a diameter of about 14.7 cm, height of 10.8 cm, orifice diameter of 7.95 cm, and a rim diameter of 9.77 cm. It has a slightly squat, rounded profile with a slight point to the low shoulder, and a flared rim. This shape is characteristic of post-A.D. 1400 (earlier Sikyatki jars are more globular in shape). The rim is painted with four sets of ticks, three of the sets contain three ticks and one set contains two ticks. It has upper and lower banding lines with aligned breaks.

The painted design is comprised of a band of four rectilinear, geometric units, paired and alternating. Each has internal bifold rotational symmetry (four parts, paired, rotated). The dense black paint bleeds at the edges, but it is thick enough to sit up from the surface; one can see the order of brushstrokes, a feature that would make it amenable to a study of motor patterns. The red paint is somewhat irregular. In one pair of design elements, red touches black; in the other elements, red is not outlined all the way round, which tends to be a late (post-ca. A.D. 1500) design feature in Sikyatki Polychrome. Otherwise, the elements are typical of the A.D. 1300s, as well as later.

The jar's rim has a few chips, and the base has an abraded patch, but the vessel does not appear to have been heavily used. It has no interior decoration.

Gourds

CANY 37899 is a half gourd, measuring about 22 cm wide, 16 cm high (stem to stern) and 11.4 cm deep. It is shaped like a hazelnut, rounded with one pointed end. The cut edge is irregular with saw-like notching. The exterior surface has a smooth yellow crust in patches over a darker, orangish surface, but does not appear to be painted. No abrasion from use is apparent. A sample taken from the gourd's margin was submitted to Beta-Analytic, Inc. for dating and it revealed a measured radiocarbon age of 290 +/- 40 (Beta-291475; gourd; $\delta^{13}\text{C}=-21.9\text{‰}$). This measured radiocarbon age translates to a 2-sigma calibration date of cal A.D. 1450 to 1650 (cal BP 500 to 300).

CANY 37900 is a half gourd, that is dipper-shaped, and cut with saw-like notching, then sanded. The irregular handle area appears cut (notched), and not snapped. The gourd measures about 25 cm long, 15 cm wide, and 3.7-4.2 mm thick. The exterior surface has a few longitudinal scrape marks in a blackened area of the surface, but not much apparent use wear. There is no sign of abrasion from use. A sample was taken from the gourd's margin and submitted to Beta-Analytic, Inc. for radiocarbon dating. The sample revealed a measured radiocarbon age of 440 +/- 40 (Beta-291476; gourd; $\delta^{13}\text{C}=-24.0\text{‰}$), resulting in a 2-sigma calibration date of cal A.D. 1410 to 1470 (cal BP 540 to 480).

CANY 37898 is a dipper-shaped half gourd, cut with a saw-like motion, that shows unsanded, notched edges. The handle end was snapped. There is no apparent abrasion from use, but the exterior surface has longitudinal scratches in the light yellow surface covering a darker orange surface, suggesting it might have been scraped. The interior is flaky, not scraped. There is no apparent paint, or residues, apart from some darkening near the handle and on one side of the bowl. It measures about 28 cm long, 16 cm wide, and ranges from 4.5 to 5.3 mm thick. A sample from this gourd was submitted to Beta-Analytic, Inc. for radiocarbon dating. It resulted in a measured radiocarbon age of 360+/-40 (Beta-291474; gourd; $\delta^{13}\text{C}=-23.1\text{‰}$), with a 2-sigma calibration date of cal A.D. 1440 to 1540 (cal BP 510 to 420) AND cal A.D. 1540 to 1630 (cal BP 400 to 320).

CANY 37902 is a whole gourd, measuring 15 cm wide by 13 cm high, with a 2 cm orifice diameter where the stem is attached. There are vertical saw-like cuts around the orifice where the stem was removed to make the opening. It has no apparent use wear, residues, or paint. This gourd was not sampled for radiocarbon dating.

CANY 37901 is a small half gourd with a neck. It measures 13.7 cm long, 11.6 cm wide, and 4.4 to 2.8 mm thick. The edge is notched from having been cut in a saw like motion, then sanded. It has no apparent use wear, except that one edge is rounded a little bit – the gourd could have been used for dipping, but has no scrape marks on the exterior surface to suggest that this was the case. The gourd has cracked. It was not sampled for radiocarbon dating.

CANY 37903 is a whole gourd that is broken at the handle and glued back together. It measures about 30 cm tall/long and about 14 cm width(max). The neck/handle is about 4.5 cm across. It has a light yellow rind that is mostly intact, but shows peeling on the handle. It has some scratches/cuts on the body and around the tip of the neck. One cut encircles the tip of the neck. Shallow vertical cut marks suggest initial scoring in preparation for splitting the gourd into two dippers. Hays-Gilpin suggests that

this is the type of gourd worn as a penis cover by some katsinas and clowns, especially with the groove scored around the tip.

CANY 37897 is a half gourd with cracks repaired in two places with yucca stitching. The edge was cut with vertical saw strokes. The perforations that were made to house the stitching are not round holes, but small slots. It is stitched with yucca leaf that is hard, a bit shiny, and not fuzzy. This piece measures 2.5-3.6mm thick, 13.7cm wide at the bowl, and about 25 cm long. It has a few cut marks on the neck/handle on the opposite side from the repaired crack. A sample of the yucca stitching was taken and submitted to Beta-Analytic, Inc. for radiocarbon dating. The measured radiocarbon age is 300+/-40 (Beta-291473; gourd; $\delta^{13}\text{C}=-21.6\text{‰}$), resulting in a 2-sigma calibration date of cal A.D. 1440 to 1640 (cal BP 510 to 310).

CANY 37896, consists of four ceramic sherds that were also found in the small rockshelter that housed the pottery and gourd cache. None of the sherds appear to be culturally associated with the other vessels and gourds in the cache. They definitely are not Hopi, and could have been locally produced.

- A. Sooted corrugated sherd with multilithic sand temper OR grainy black crushed rock
- B. Sooted corrugated sherd with quartz sand temper, and dark inclusions. Does not look Hopi.
- C. Bowl rim sherd, spalled. It has pinkish to gray colors, is tempered with multilithic sand, and has a flat rim. The surfaces are not polished and no paint is visible.
- D. Sooted corrugated sherd, tempered with multilithic sand or crushed rock, mostly opaque white quartz or feldspar. Some fragments appear to be andesite/diorite (white with black inclusions).

CANY 37927 is a bag of shredded juniper bark. According to the donor, this bark was found inside one of the larger pots in the cache. A sample was submitted to Beta-Analytic, Inc. for dating and it revealed a measured radiocarbon age of 380+/- 40 (Beta-291477;bark; $\delta^{13}\text{C}=-24.2\text{‰}$), resulting in a 2-sigma calibration date of cal A.D. 1440 to 1540 (Cal BP 510 to 420) AND cal A.D. 1540 to 1630 (Cal BP 400 to 320).

CANY 37928, consists of corn that was found within one of the pots in the cache. A segment of one of the corn cobs was submitted for chronometric dating. The measured radiocarbon age of the specimen was 620+/- 30 (Beta-291478;corn; $\delta^{13}\text{C}=-8.5\text{‰}$), resulting in a 2-sigma calibration date of cal A.D. 1040 to 1220 (cal BP 910 to 730). This date places the corn in the Pueblo III period.

Archaeological sites in the vicinity of the cache site consist mainly of habitation and storage sites, some of which contain corn. Samples from these sites also yielded dates within the Pueblo III period, as seen in the following table.

Table 1. Sites in the vicinity of the Dansdill pottery cache site.

Site Number	Site Type	Cultural Affiliation	Basis of Cultural Affiliation
42SA1549	Habitation	Late Formative: Pueblo III	C-14 of corn; ceramics; masonry architectural style
42SA1550	Habitation	Late Formative: Late Pueblo II-Pueblo III	Ceramics; masonry architectural style; cottonwood triangular projectile point
42SA1551	Habitation	Late Formative	Architectural style
42SA1552	Storage	Late Formative: Pueblo III	C-14 of corn; ceramics; masonry architectural style
42SA1553	Habitation	Late Formative: Pueblo III	C-14 of corn; ceramics; masonry architectural style
42SA1554	Habitation	Late Formative: Pueblo II-Pueblo III	C-14 of corn; ceramics; masonry architectural style
42SA1556	Habitation	Late Formative	Architectural style and ceramics
42SA1558	Habitation	Archaic: 2,000 B.C. – A.D. 300(?); Late Formative: Pueblo III	C-14 of corn, and of a hafted point shaft and cordage; rock art style; Cottonwood triangular projectile point.
42SA1559	Habitation	Late Formative: Pueblo III	C-14 of mat fragment

Results of Chronometric Analysis

Six samples were submitted to Beta-Analytic, Inc., including samples of 3 gourds, 1 sample of yucca stitching from one gourd, a sample of shredded juniper bark originally found in one of the pots, and a portion of a corn cob also originally found in one of the pots. Only half gourds that were already cracked or in some way exhibiting a jagged, broken margin that allowed for easy removal of a specimen were sampled. With the exception of the corn cob, which was affiliated with the Pueblo III period, all of the samples revealed radiocarbon ages contemporaneous with the Pueblo IV Hopi pottery that was cached at the site. Five of the samples (gourds, yucca stitching, and bark) were statistically the same at the 95% probability level, with a mean pooled conventional radiocarbon age of 388 BP (derived from Calib 6.0.1).

This chronometric data is important to an increased understanding of this interval of Hopi history. Hays-Gilpin (2010) states that the pottery typology and dating scheme for the Pueblo IV Hopi period is underdeveloped because few sites have been excavated on the Hopi Mesas. She adds, “prior to Spanish contact, and during the mission period, only a few large sites were occupied (Awat’ovi, Kawayk’a, Old Walpi, Old Shongopavi, and Old Wapi) where these vessels could have been made. Of

these, only Awat’ovi and Kawayka’a have been partially excavated, in the 1930s, prior to the development of precise dating techniques”.

Table 2. Results of Radiocarbon Dating of 6 Samples from the Dansdill Collection.

Sample Number	Beta Number	Material	Measured Radiocarbon Age	13C/12C Ratio	2 Sigma Calibration
CANY37897	Beta-291473	Yucca stitching	300 +/- 40 BP	-21.6‰	cal A.D. 1440 to 1640 (cal BP 510 to 310)
CANY37898	Beta-291474	Sample from half gourd	360+/-40 BP	-23.1‰	cal A.D. 1440 to 1540 (cal BP 510 to 420) AND cal A.D. 1540 to 1630 (cal BP 400 to 320)
CANY37899	Beta-291475	Sample from half gourd	290+/-40 BP	-21.9‰	cal A.D. 1450 to 1650 (cal BP 500 to 300)
CANY37900	Beta-291476	Sample from half gourd	440+/- 40 BP	-24.0‰	cal A.D. 1410 to 1470 (cal BP 540 to 480)
CANY37927	Beta-291477	Juniper bark found in one of the pots	380+/-40 BP	-24.2‰	cal A.D. 1440 to 1540 (cal BP 510 to 420) AND cal A.D. 1540 to 1630 (cal BP 400 to 320)
CANY37928	Beta-291478	Portion of corn cob	620+/-30 BP	-8.5‰	cal A.D. 1040 to 1220 (cal BP 910 to 730)

Salt Comparative Analysis

Our understanding of prehistoric salt sources and trade is limited. In 1954, Walter Taylor conducted a chemical analysis of salt samples derived from the Walapai Reservation with inconclusive results. Euler (1954) filed an addendum to Taylor’s analysis, stating that further studies suggest the Walapai salt sample was likely obtained from a natural source along the Virgin River, in Clark County Nevada. If so, this source corroborated the statement made by the Walapai that prehistoric salt was obtained from a place down the river currently under water (Lake Mead). Baldwin (1976) reports that salt from Mesa Verde sites may be derived from two possible sources, including Sevier Valley deposits in central Utah and Cow Creek Valley in southeastern Idaho. This finding led to a discussion of possible trade between Fremont affiliated peoples and those occupying Mesa Verde.

Upon learning of our project, Dr. William Lucius (email communication 10/25/2010) offered several theories about the procurement of salt in the prehistoric southwest and the possible source of the salt found at the Canyonlands cache. Possible sources of prehistoric salt include Zuni Salt Lake, Willow Springs, and Salina.

J.P. Bradbury (<http://gsabulletin.gsapubs.org>) describes Zuni Salt Lake as a shallow saline lake located in a maar in west-central New Mexico. He explains that “the basin was formed during the late Pleistocene when volcanic and phreatic explosions punctured Paleozoic and Mesozoic strata”. The lake is fed by runoff and salt-laden springs. Salt crusts are present, composed of halite, calcite, and gypsum. These crusts co-occur with layers of clay and organic matter.

Willow Springs is located near the junction of the Colorado River and the Little Colorado River within the Grand Canyon. Euler (in Billingsley et al. 1997:15–20) states:

Near the confluence of the Little Colorado River in the Tapeats Sandstone salt leaches out of the sandstone as water percolates through the coarse-grained sands and then evaporates. An ancient trail from the Hopi mesas to the salt deposits travels westward across the Painted Desert to the Little Colorado River gorge, then plunges down to the river through what today is called Salt Trail Canyon, and proceeds downstream. The salt deposits can also be reached by following the Tanner and Beamer Trails. Since prehistoric times, people have made this precarious journey, close to the mystical underworld, returning with their heavy burdens. A man who returned with the salt was considered very brave (Titiev, 1937). Hopi continue to use salt in ceremonies, but changing cultural beliefs among younger generations have diminished the number of collecting expeditions.

Euler (1997) adds that salt is found at locations at the base of the Tapeats Sandstone throughout the Grand Canyon. Other regional sources include the portion of the Virgin River drowned by Lake Mead, the Salt Caves near the former St. Thomas site, and at outcrops between St. Thomas and the former confluence of the Virgin and Colorado Rivers.

According to Lucius (email communication 10/25/2010), the Utes informed Dominguez and Escalante of a salt source named the LaSal Mountains. The specific location may have been the Paradox Valley area. Just as the Mesa Verde study mentioned, Lucius identified another source in Utah in the central Sevier valley near the town of Salina, so named because of a major salt outcrop currently being mined by Redmond Salt.

In an effort to broaden the understanding of prehistoric regional salt sources, and perhaps identify the source of the salt contained in the Hopi pot found at the Canyonlands cache, we submitted four salt samples to Dr. Steven DiNaso at Eastern Illinois University to determine their “chemical signatures”. These samples were derived from (1) CANY37894, the salt found in one of the Hopi pots from the Dansdill collection, (2) a source at the junction of Salt Trail Canyon and the Little Colorado River, (3) the Zuni Salt Lake, (4) from a prehistoric site in the Abajo Mountains, in southeastern Utah, and (5) from the Redmond Salt Mine near Salina, Utah. Dr. DiNaso is using inductively coupled plasma mass spectrometry (ICP-MS) to compare the “signatures” of the four salt samples or perhaps LA-ICP-MS (Laser Ablation ICP) in association with Dr. Simonetti at the Notre Dame University ICP lab. The goal is to run a few analyses to see what, exactly, the ‘salts’ are composed of, which, according to Dr. DiNaso, may involve isotope ratios.

The results of the study are pending, and unfortunately, may not be reported at this SAA symposium. The results will be published at a later date.

Summary and Conclusions

Late prehistoric (PIV), protohistoric, and historic Hopi pottery is becoming better known at archaeological sites in southern Utah. A perusal of regional literature indicates sherds and vessels are found at sites in Grand Staircase-Escalante National Monument, the Glen Canyon region, Red Rock Plateau, LaSal Mountains near Moab, Utah, and near Cisco, Utah (see Bernardini and Kuwanwisiwma 2006). While preparing this paper, I learned from Kenny Wintch of Utah’s SITLA that he recovered a couple of Jeddito Black-on-yellow sherds at a site near Torrey, Utah that dated to the early 14th century (personal communication 2010). Janet McVickar, working with the NPS, found a Jeddito yellow ware sherd at Natural Bridges National Monument in the 1980s (NPS email to A. Anderson 2002, on file at SEUG). Winston Hurst, independent archaeological consultant, has seen Hopi yellow ware in Dark Canyon, and at a handful of sites around Blanding, Utah and Comb Wash (personal communication 2010). Michael Wolfe, an archaeologist working with the Bureau of Land Management (BLM), reported to me in a personal communication that Hopi Jeddito yellow ware has been reported at Tenmile Canyon, just north of Moab, on BLM-administered lands.

In their examination of sociopolitical complexity of the late prehistoric period on the Colorado Plateau, Adams, Stark and Dosh (1993) state that the presence of Jeddito Yellow Ware at Northern Frontier sites points to limited but continued occupation of the area by small groups of Pueblo

populations into the Pueblo IV period, specifically suggesting periodic use by Hopi Mesa residents. With regard to interactions between the Athapaskan or Numic speakers and the Hopi, they conclude that there is no compelling evidence that such trade occurred during the late prehistoric period. Instead, they surmise that the preponderance of lithic and ceramic scatter sites indicates continued occupation or reuse of existing habitations by small groups engaged in agricultural activities. They add that historic ethnographers relate Hopi use of the area to include hunting, gathering, eagle hunting expeditions, and visiting shrines that mark ancestral homes (Beaglehole 1937; James 1974; Page 1982; Whiting 1939). Others (e.g. Titiev 1937) report on salt gathering as well as eagle hunting in areas north of the Hopi Mesas.

In his dissertation, Lipe (1966) reports that 4% of sites recorded by the Glen Canyon Project team revealed indications of Pueblo IV Hopi visitation, as evidenced by Awatobi and Jeddito Yellow Ware ceramic sherds (i.e. Jeddito Corrugated, Jeddito Plain, Jeddito Black-on-yellow, Sikyatki Polychrome, and Unidentified Jeddito Yellow Ware). Jeddito Corrugated sherds dominated the visible assemblage. At five sites, considered to be “pure” sites, there are no distinctive artifacts other than the ceramics. At two of these “pure” sites, firepits were found; at the other three sites no structures or features were found. Fifteen sites had Jeddito-Sikyatki evidence and also had been previously occupied during the Pueblo III period. These sites tend to be located in the open and were probably camps occupied for a short time by small parties. Possible motivations for Hopi visits include: hunting and collecting, trading with peoples located north of west of the Red Rock Plateau region, or visitation of shrines. Lipe summarizes:

“In conclusion, there does not seem to be enough evidence to allow us to determine the specific objectives of the Pueblo IV Hopi visits to the region. It does seem virtually certain, however, that the visits were brief, and that farming was not practiced. In view of the scarcity of permanent surface water sources in the surrounding highlands, it may be that travellers found it useful to detour into the canyons to take advantage of their more abundant and easily discoverable springs and water-filled natural rock “tanks””.

Others believe Jeddito Yellow Ware presence may not be due to trade between Hopi and Paiute groups, since Jeddito Yellow Ware isn't found in association with Paiute-Shoshone pottery (Lindsay 1967:35, Bernardini and Kuwanwisiwma 2006). Most of the Jeddito Yellow Ware found in southern Utah is utility ware, not likely to be widely traded. Most Jeddito Yellow Ware in the Grand Staircase-Escalante National Monument (GSENM) predates A.D. 1400, a period that is likely before Paiute groups entered the region. Bernardini and Kuwanwisiwma (2006) believe that the best explanation for the

presence of Jeddito Yellow Ware is that Hopi individuals made trips (during late prehistoric, protohistoric, and historic times) from the Hopi Mesas to GSENM for hunting, gathering resources, and revisitation of ancestral villages, shrines, springs, and eagle nests.

According to Kelley Hays-Gilpin (2010) the ceramics from the Dansdill collection likely represent a utilitarian collection of pots that were probably not intended for trade. If we rule out trade, as other archeologists working with Hopi PIV ceramic assemblages in southern Utah have done, the presence of these Hopi PIV pots in Canyonlands is then explained as the result of a hunting or foraging trip, or a revisitation of ancestral habitation sites or shrines.

It appears that the interpretive work conducted by Dr. Lipe and others on Cedar Mesa and the region is quite pertinent and relevant to the current study. Our findings with regard to a single cache site at Canyonlands echo Dr. Lipe's conclusions about the work he conducted in the Red Rock Plateau region with the Glen Canyon Project survey team. The Canyonlands cache contained corn dating to the Pueblo III period as well as gourds and pottery affiliated with the Hopi Pueblo IV period, just as Lipe noted that Hopi PIV sherds were found at sites occupied earlier during the PIII period. Based on Dr. Kelley Hays-Gilpin's interpretation that the cache contained utilitarian goods that were not suitable candidates for trade, we can assume that the individuals who cached the items were in the area to hunt and gather, or were visiting a shrine. Bernardini and Kuwanwisiwma (2006) point out that many of the sites in southern Utah that contain early PIV Hopi pottery do not contain Paiute ceramics. This is the case with the Canyonlands Cache: there is no evidence of Paiute use at any of the sites in the vicinity of the cache. Hence, it seems that the cache was useful to Hopi PIV people who were following a travel route that included known sources of water, and their purpose for traveling will remain unknown for now.

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