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PHOTO ESSAY

ARCHAEOLOGY IN RANGE CREEK

Corinne Spring and Shannon Boomgarden, Department of Anthropology, University of Utah, Salt Lake City, UT 84112

Line Cabin Chimney:

This stone chimney

is all that remains

of a series of line cabins

that at one time

were home to cowboys

following their herds.

Locomotive granary:

More than one hundred storage features have been recorded in the canyon.

This is a unique rock art panel on an inaccessible ledge of Locomotive Rock.

Alcove Dancers:

These Fremont anthropomorphs are brightly painted in shades of red and orange, and sporting elaborate head dresses.

Lisa's Lookout:

This circular structural feature is located on a prominent point with a clear view of the surrounding countryside.

We often refer to this red and white painted

rock art panel as the TV because

of its large size and shape.

Sunset Rock.

Not all of the storage features are located in the cliffs. This one is located on a low lying ledge. It shows evidence of having been repaired with different colors of mud.

Unfortunately all is not well in Range Creek. Evidence of vandalism can be spotted throughout the canyon. It is worse outside the area protected by the Wilcox family.

INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS OF SNAKE VALLEY SERIES CERAMICS FROM SOUTHWESTERN UTAH

Alan D. Reed, Alpine Archaeological Consultants, Inc. Montrose CO

Robert J. Speakman, Smithsonian Institution, Museum Conservation Institute, Suitland, MD

A sample of 117 Snake Valley series shards from southwestern Utah was subjected to Instrumental Neutron Activation Analysis (INAA). INAA was successful in identifying seven compositional groups, each of which is thought to represent a discrete manufacturing locus. One compositional group was identified in each of the site samples. Because the project sites are spread along a 221-kilometer segment of the pipeline corridor, it is likely the Group 7 ceramics were distributed through trade. The occurrence of Snake Valley series pottery at East Fork Village, a project site situated outside the core area of Snake Valley series production, is also attributed to exchange.

Introduction

A major trend in ceramic analysis has been to apply increasingly sophisticated analytic methods to identify the materials used in pottery construction. Although classification of Fremont shards has long relied on identification of temper types (Madsen 1977), only in the past two decades has microscopic inspection of nearly every shard in a collection to identify temper types become a common practice. As analytic methods have become more rigorous, archaeologists have become increasingly aware of variability of material types within ceramic collections. This awareness has led to application of specialized analytic techniques for samples of ceramics, including petrographic analysis and various methods of trace-element analysis. Application of such analytic techniques has led to further realization of the material variability within ceramic assemblages.

Archaeological investigations conducted in support of the Kern River 2003 Expansion Project (Figure 1) have provided an opportunity to further explore the range of variation in the raw materials used to manufacture prehistoric ceramics in Utah. A number of sites were excavated in southwestern Utah (Reed et al. 2005). Several of the project sites yielded Snake Valley series ceramic types, including Snake Valley Gray, Snake Valley Corrugated, and Snake Valley Black-on-Gray. Snake Valley series ceramics are attributed to the Fremont and are primarily found in southwestern Utah (Madsen 1977). One-hundred seventeen Snake Valley series shards were submitted to the Archaeometry Laboratory at the University of Missouri Research Reactor Center (MURR) for instrumental neutron activation analysis (INAA). INAA determines the relative concentrations of a set of elements within the objects of study, allowing statistical tests to group samples of similar composition. Although sample selection was guided by project-specific research questions that focused on relationships between specific project sites, the resulting data further illuminate material variation within the Snake Valley series and permit the examination of some recent interpretations of patterns of material variability formulated by other researchers.

RESEARCH CONTEXT

The archaeological literature from the eastern Great Basin indicates considerable interest in the variability of ceramic material constituents. Janetski's (2002) recent examination of Fremont exchange systems considers both inter-regional and intra-regional exchange. Janetski observed that temper analyses and shard refiring experiments indicate that substantial percentages of non-local Fremont ceramics occur at sites such as Five Finger Ridge, Radford Roost, and Icicle Bench in Utah's Clear Creek Canyon, and that between 35 and 85 percent of the floor-contact ceramics at Baker Village in eastern Nevada may have been imported (Janetski 2002:358); see also (Wilde and Soper 1999). The relatively high frequency of non-local ceramics at these sites indicated to Janetski the importance of intra-regional Fremont ceramic exchange. Using various lines of evidence, Janetski (2002) made a strong case that much of the exchange occurred at trade fairs or festivals, probably held at the larger village sites.

Several other recent investigations have employed X-ray diffraction of ceramic temper as a means to identify chemical composition. According to Bright et al. (2005:125), X-ray diffraction is a relatively crude technique, but the method is inexpensive, permitting the processing of relatively large samples. X-ray diffraction indicates what minerals are present but, unlike INAA, does not indicate the proportion of those minerals. Because different proportions of a mineral may characterize different raw material sources, X-ray diffraction is not an especially sensitive technique for differentiating sources that are somewhat similar in composition. Simms et al. (1997) subjected a sample of 120 shards from the vicinity of Great Salt

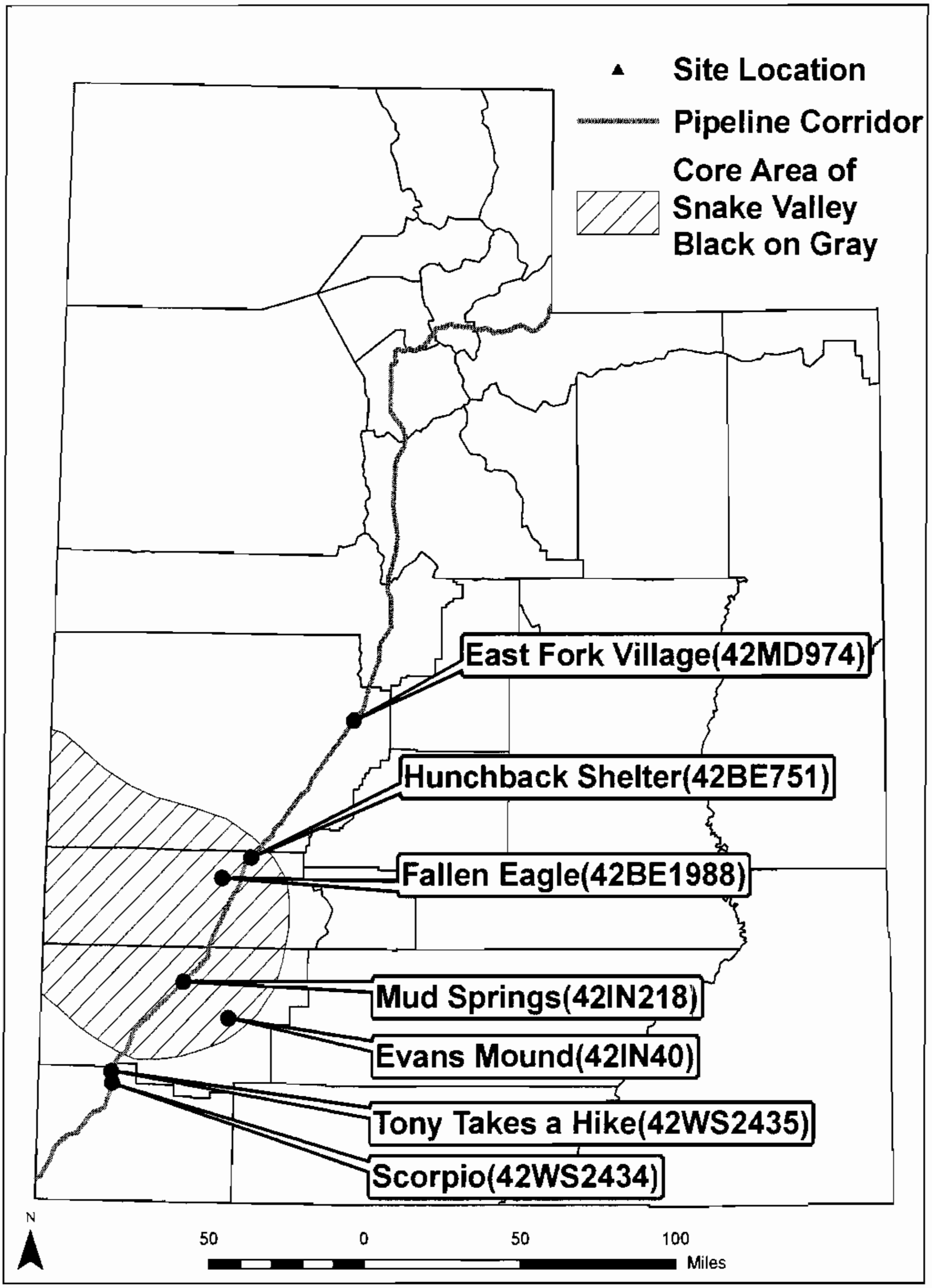

Figure 1. Location of sites discussed in the text

Lake to X-ray diffraction and compared that sample's temper materials to a sample previously analyzed from the Utah Lake area (Hendricks 1990). Their analysis indicated that ceramics from a specific area tended to be manufactured with similar temper materials, regardless of ceramic type or age. They observed greater variability within similar types between the Great Salt Lake and the Utah Lake areas than between the types in either region (Simms et al.1997:787). Simms and his colleagues also subjected three Snake Valley Red-on-buff shards that were found in the Great Salt Lake area to X-ray diffraction analysis. As noted above, Snake Valley series ceramics are most common in southwestern Utah, and the occurrence of Snake Valley ceramics in the Great Salt Lake area would generally indicate prehistoric trade. X-ray diffraction analysis, however, indicated that the three shards were tempered with local materials, so were undoubtedly of local origin (Simms et al. 1997). This suggests that ceramic styles might be more conducive for widespread dispersal than actual pots. The data generated by Simms et al. (1997) also suggested that sites representing less residential mobility were characterized by less variability in temper materials than were sites representing greater residential mobility. At the two sites in their study representing lesser residential mobility, between 78 and 82 percent of the ceramic sample consisted of the two most popular temper materials. In contrast, only 29 percent of the shards from the site representing greater residential mobility were tempered with the two most popular temper types (Simms et al.1997:788).

Bright et al. 2005 also used X-ray diffraction in their study of ceramics and mobility at the Camels Back Cave site in northwestern Utah. A total of 163 shards from Camels Back Cave and 32 other sites in Utah's west desert were subjected to X-ray diffraction analysis. The resulting data were summarized by an index that reflected the degree of temper variability between site assemblages. The analysis suggested that the ceramics found at short-term sites within 50 km of a residential base were compositionally more similar to the ceramics from the central residential base than were assemblages beyond the 50 km radius. Residential farming sites and sites with high expectation for repeated occupation, such as rockshelters, tended to be characterized by less variability in temper materials than sites occupied on a short-term basis (Bright et al. 2005:190). The greater diversity of temper types at short-term sites is thought to reflect on-site manufacture of ceramics, where local materials, unavailable at primary habitation sites, were utilized.

Christopher Watkins has recently completed a thesis that focused on Snake Valley series ceramics from the Parowan Valley (Watkins 2006). Watkins subjected 113 shards and a sample of welded tuff geological sources from the Parowan Valley that were thought to represent ceramic material sources to Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) to identify trace elements. ICP-MS identified the concentrations of 47 elements within the samples. The resulting data were subjected to Principal Component Analysis and Cluster Analysis so the data could be inspected in two dimensions and patterns recognized (Watkins 2006). The shard sample included 106 shards classified into the Snake Valley series, five Sevier Gray shards, and two unclassified shards with quartz temper. Although the majority of the Snake Valley series ceramics was from the Parowan Valley, some were also selected from a site in the Sevier Valley, from Baker Village in eastern Nevada, and from the South Temple site in Salt Lake City. The sample from the South Temple site included both classic and non-classic varieties of Snake Valley series pottery (Watkins 2006). Classic Snake Valley ceramics are tempered with welded tuffs, whereas non-classic specimens are technologically similar to others classified into the series, but evidence greater variation in temper material (see Lyneis 1994).

As expected, Watkins's ICP-MS research demonstrated that the Sevier Gray specimens are compositionally different from the Snake Valley series. The non-classic Snake Valley series from the South Temple site and the quartz-tempered shards from Baker Village also are compositionally much different from other Snake Valley shards, suggesting manufacture outside of the Parowan Valley. Although the raw material analyzed by Watkins was determined to be compositionally different from the materials fashioned into classic Snake Valley series pottery from the Parowan Valley, Watkins maintains that the Parowan Valley was probably the main locus of Snake Valley series pottery production (Watkins 2006). The ICP-MS analysis revealed considerable chemical variation in ceramic material types within the sample of shards from the Parowan Valley. Despite this apparent variation, Watkins failed to identify distinct groups within the Snake Valley series sample (Watkins 2006:78). Consequently, the elemental variation suggested to Watkins that either Snake Valley shards were manufactured at multiple, mineralogically related sources within the Parowan Valley or that the material sources are either chemically indistinct or heterogeneous.

Several expectations may be derived from the previous ceramic studies described above. These expectations can be examined with the Kern River 2003 Expansion Project ceramic data and include:

1. There should be considerable mineralogical variation within ceramic types.
2. The variation in mineralogical composition within types is expected to vary by area of manufacture.
3. Sites occupied on a short-term basis, without anticipated site reoccupation, should evidence greater compositional diversity than sites anticipated for reoccupation or sites occupied for long periods.
4. It may be difficult to identify discrete sources of raw materials used for the manufacture of Snake Valley series pottery in the vicinity of the Parowan Valley.

THE CERAMIC SAMPLE

Snake Valley series ceramic shards from seven sites in western Utah were submitted for INAA. Five of the sites were excavated as part of the pipeline project. From north to south, these include East Fork Village (42MD974) in Millard County, Hunchback Shelter in Beaver County, the Mud Springs site (42IN218) in Iron County, and the Scorpio (42WS2434) and Tony Takes a Hike (42WS2435) sites in northern Washington County. Ceramics from two sites outside of the pipeline corridor also were included in the study: these are the Fallen Eagle site (42BE1988) near the community of Milford in Beaver County, a Fremont site purported to include a ceramic kiln; and Evans Mound (42IN40), a large Fremont village northeast of Cedar City in Iron County. Evans Mound was included because past excavations had yielded large quantities of ceramics, and because it was presumed that the site was the locus of ceramic manufacturing. Ceramic samples from Evans Mound and Fallen Eagle were selected from contexts that have been chronometrically dated and found to be roughly contemporaneous with the shards from a Fremont component at Hunchback Shelter.

All the sites in the study except East Fork Village occur within or immediately adjacent to the core area for Snake Valley ceramics, as defined by Madsen (1977; see also Watkins 2006). East Fork Village is north of the core area for Snake Valley ceramics; its ceramic assemblage is dominated by Sevier Gray, a Fremont type common in central Utah (Figure 1). The sites represent a range of residential mobility. East Fork Village and Evans Mound have residential architecture, middens, and other indications of long-term occupation. A house pit and midden were discovered at the Fallen Eagle site, suggesting at least season-long occupation of the site (Stokes et al. 2001). Hunchback Shelter lacks architecture, but was repeatedly reoccupied during the Formative stage. It seems likely that site occupants anticipated site reuse, so may have cached cultural materials for future use. The remaining sites lack apparent architecture and were probably occupied on a relatively short-term basis.

METHODS

Neutron activation analysis was conducted on 117 shards. Sixty-five shards were classified as Snake Valley Gray, 19 were Snake Valley Black-on-gray, and 33 were Snake Valley Corrugated.

Pottery specimens were prepared for INAA using standard MURR procedures. The exterior shard surfaces and all adhering soil were first removed using a Dremel tool and silicon carbide bit. Burred samples were then washed with deionized water, allowed to air dry, and then crushed into a fine powder using an agate mortar and pestle. Portions of each specimen were retained when possible for inclusion in the MURR pottery archives. The powdered samples were oven dried at 100° C for 24 hours. Portions of approximately 150 mg were weighed and placed in small polyvials used for short irradiation. At the same time, an additional 200 mg of each sample was weighed into high-purity quartz vials used for long irradiations. Along with the unknown samples, reference standards of SRM-1633a (coal fly ash) and SRM-688 (basalt rock) were similarly prepared, as were quality control samples (e.g., standards treated as unknowns) of SRM-278 (obsidian rock) and Ohio Red Clay (a standard developed for in-house use).

At MURR, INAA of pottery and clays consists of two irradiations and a total of three gamma counts (Glascock 1992). Short irradiations involve a pair of samples being transported through a pneumatic tube system into the reactor core for a five-second neutron irradiation using a flux of 8×10^{13} n $cm^{-2} s^{-1}$. After 25 minutes of decay, the samples are counted for 720-seconds using a high-resolution germanium detector. This count yields data for the short-lived elements: Al, Ba, Ca, Dy, K, Mn, Na, Ti, and V. For the long irradiation, bundles of 50 or 100 of the encapsulated quartz vials are irradiated for 24 hours by a flux of 5×10^{13} n $cm^{-2} s^{-1}$. Following the long irradiation, samples are permitted to decay for seven days, and then are counted for 2,000 seconds (the "middle count") on a high-resolution germanium detector coupled to an automatic sample changer. The middle count yields determinations of seven medium half-life elements: As, La, Lu, Nd, Sm, U, and Yb. After an additional two-week decay, a second count of 8,500 seconds is carried out on each sample. This measurement permits quantification of 17 long-lived elements: Ce, Co, Cr, Cs, Eu, Fe, Hf, Ni, Rb, Sb, Sc, Sr, Ta, Tb, Th, Zn, and Zr.

The resulting data were analyzed using an array of multivariate statistical procedures. The statistical routines used to interpret INAA generated for this project have been described extensively in several publications and are not repeated here; interested readers are referred to publications by (Neff 1994, 2001, 2002) and Glascock (1992; 2004). The underlying objective of the application of multivariate statistical techniques to INAA data is to facilitate identification of discrete compositional groups. Such groups are assumed to represent geographically restricted sources or source zones (Weigland 1977). The location of sources or source zones may be inferred by comparing the unknown group to geologic source materials, or by indirect means such as the criterion of abundance (Bishop 1982) or arguments based on geological and sedimentological characteristics (e.g., Steponaitis 1996)). In the present study, clays were not included in the analysis. Consequently, all interpretations concerning “local” versus non-local production are based on the criterion of abundance. Further INAA of both pottery and clays from western Utah will only serve to clarify the interpretations discussed below.

RESULTS

INAA resulted in the identification of eight groups, designated Groups 1–8. Shards classified within each group are composed of distinctive suites of elements, suggesting that the shards within each group represent discrete ceramic production locales. Figure 2, a canonical discriminant plot, provides the best visual representation showing separation of seven of the eight compositional groups. Although Group 8 overlaps with Group 7 in this figure, this group can be shown to be distinct from Group 7 and other groups in several bivariate projections. Mahalanobis distance probabilities based on the first nine principal components (which account for more than 90 percent of the cumulative variation) confirm that the proposed subgroup structure is statistically viable. Nineteen shards (16 percent) were not assigned to any of the eight identified groups. Samples were left unassigned if they had less than 1 percent probability of membership in any of the groups or had high probabilities of membership in more than group. One unassigned sample (ADR114) exceeded 1 percent probability of membership in Group 5, but was left unassigned because its inclusion in Group 5 blurred the distinctions between otherwise discrete groups. Figure 3 illustrates the relative frequencies of the compositional groups at the project sites.

As reported by Speakman and Glascock (2005) , three shards were assigned to Group 1. Two were from East Fork Village (42MD974) and one was from the Scorpio site (42WS2434).

Geographically, these two sites are farther apart than any other two sites in the INAA study. Seven shards were attributed to Group 2 (Figure 3). Six are from the Fallen Eagle site (42BE1988), and one is from Hunchback Shelter (42BE751). Group 3 is represented by three shards, all from the Mud Springs site (42IN218). Five shards are classified as Group 4 – all from the Evans Mound site. Group 5 is represented by 21 shards, 90 percent of which are from the two sites in Iron County (Mud Springs and Evans Mound sites). Single examples of Group 5 shards were also identified at Hunchback Shelter and East Fork Village. Seventeen shards were assigned to Group 6. Group 6 shards were identified at Evans Mound, Mud Springs, Hunchback Shelter, and East Fork Village. Group 7 is the best represented of the compositional groups, comprising 39 specimens. Group 7 shards were recovered at all the sites in the study sample. Lastly, three shards were classified as Group 8. All derive from the Tony Takes a Hike site (42WS2435).

DISCUSSION

Material Variability within the Snake Valley Series

INAA indicates that there is a high degree of variability within a sample of Snake Valley series ceramics that, on the basis of microscopic inspection alone, seemed to be rather homogenous. Of the 117 processed shards, 98 were assignable to a compositional group. As illustrated in Figure 4, Groups 1,2, 3, 4, and 8 are represented in relatively low frequencies, whereas Groups 5, 6, and 7 are more commonly represented.

INAA data were used to assess the variability within the Snake Valley Corrugated, Snake Valley Black-on-gray, and Snake Valley Gray types. None of the ceramic types was clearly dominated by a single compositional group. Fifty-one Snake Valley Gray shards were assigned to specific compositional groups (Table 1). All compositional groups except Group 3 were represented within the set of plain gray shards. Thirty-one Snake Valley Corrugated shards were attributed to a specific compositional group. Groups 3, 4, 5, 6, and 7 are represented in the Snake Valley Corrugated sample. Of the 16 Snake Valley Black-on-gray shards attributed to a compositional group, five groups are represented. These include Groups 2, 4, 5, 6, and 7. The data indicate that utility vessels (plain gray and corrugated) and decorated serving/storage vessels (black-on-gray) were produced at multiple locations within southwestern Utah. Although ceramic production loci for the three types of Snake Valley series were clearly dispersed, too few INAA data exist to determine the probable locations of ceramic production.

The classification of 84 percent of the shard sample into discrete types suggests that INAA

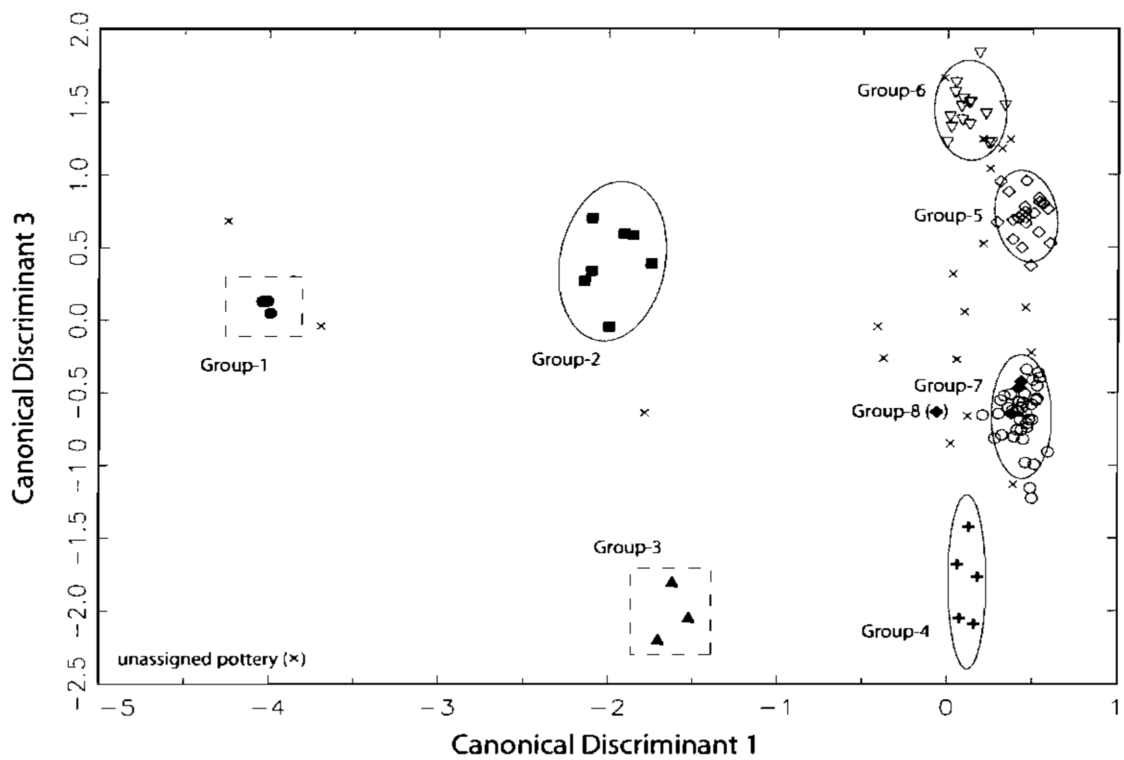

Figure 2. Canonical discriminant plot of seven of the eight compositional groups.

is a more useful technique for differentiating raw ceramic materials than the ICP-MS technique employed by (Watkins 2006), which was unable to discern discrete compositional clusters within the large set of classic Snake Valley series ceramics from the Parowan Valley. Watkins (2006) suggested that the absence of discrete compositional clusters indicated prehistoric use of mineralogically related sources or that the sources were either chemically indistinct or heterogeneous. There are several reasons to doubt this scenario. Watkin's ceramics were prepared for ICP-MS analyses using methods that are not necessarily the norm for ICP-MS of archaeological pottery (e.g. Kennett et al. 2004; Little et al. 2004). In fact, the method for analysis is described as being a "near-total digestion" which is problematic given that the data do not represent bulk chemical. It is not apparent if matrix-matched quality-control samples were included with each batch of sample digestions (digestions in most laboratories typically occur in batches of 6, 10, 12, etc.). Consequently, it is not possible to (1) assess how well the digestion procedure worked, (2) describe the analytical precision of the experiment, or (3) determine if there is analytical 'drift' in the dataset. It is therefore possible that Watkin's identification of compositional groups was

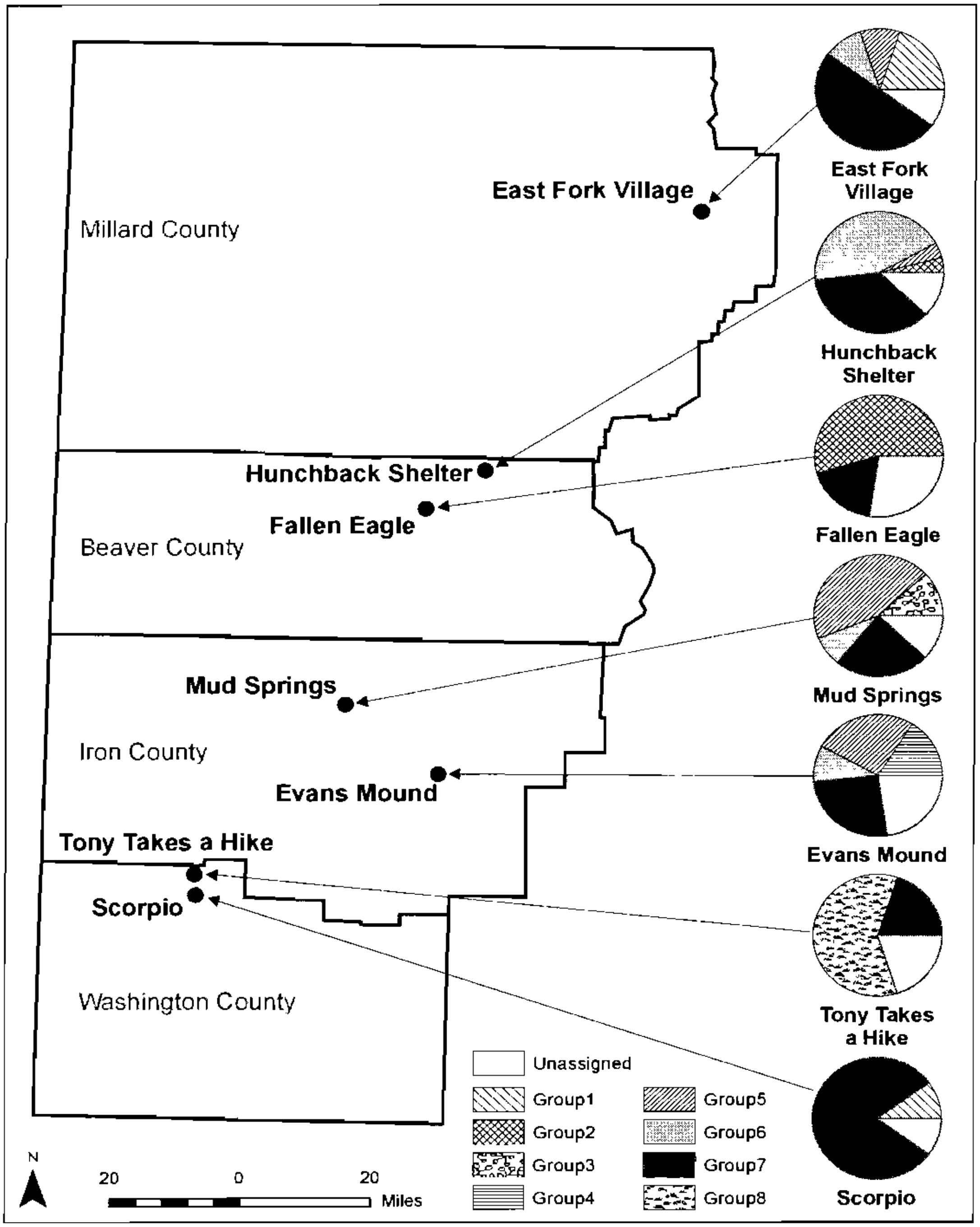

Figure 3. Relative frequencies of compositional groups at the project sites.

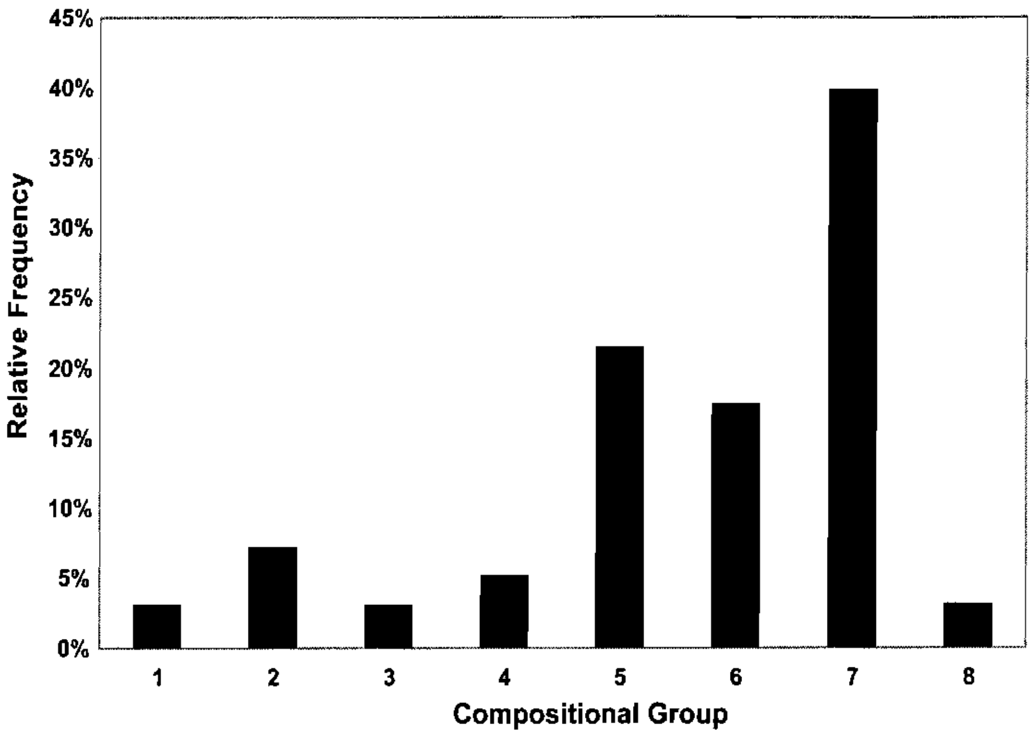

Figure 4. Frequencies of compositional groups within ceramic types.

Table 1. Compositional Groups by Ceramic Types and Site.

Site	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Unassigned	Total
Snake Valley Gray										
42BE751						2	6		2	10
42BE1988		6					2		3	11
42IN40				1	2	1	4		5	13
42IN218					4		5		1	10
42MD974	2				1	1	1		1	6
42WS2434	1						8		1	10
42WS2435							1	3	1	5
Total	3	6	0	1	7	4	27	3	14	65
Snake Valley Black-On-Gray										
42BE751		1					3			4
42IN40				1	1		2		2	6
42IN218					1	2	1		1	5
42MD974							4			4
Total	0	1	0	1	2	2	10	0	3	19
Snake Valley Corrugated										
42BE751					1	9			1	11
42IN40				3	5	2	2			12
42IN218			3		6				1	10
Total	0	0	3	3	12	11	2	0	2	33

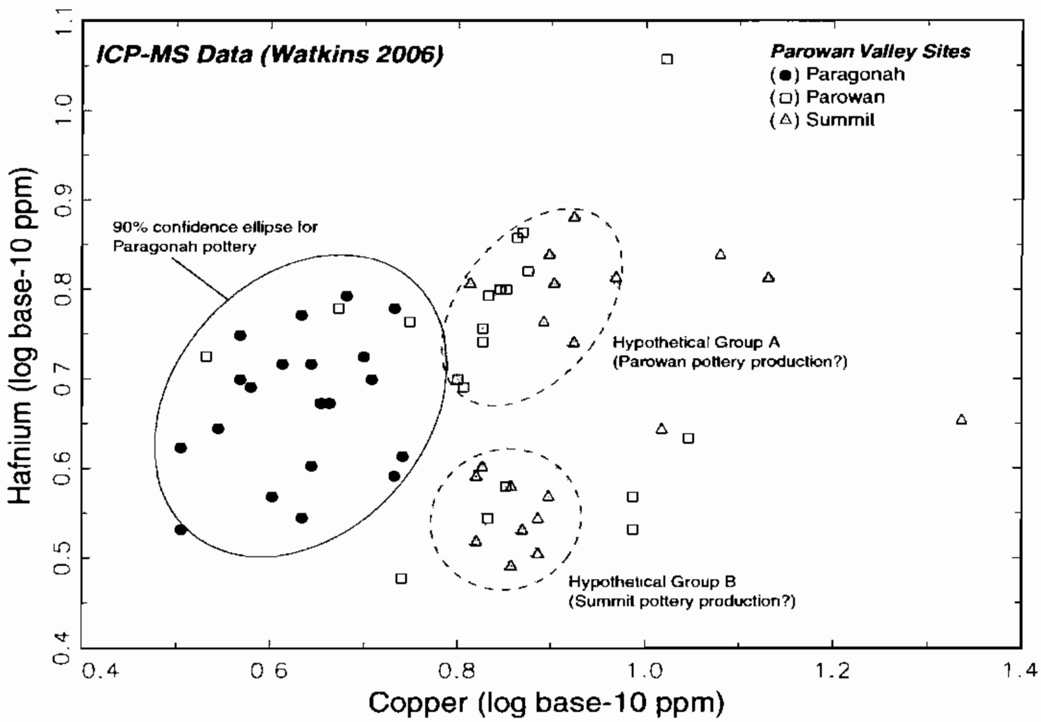

Figure 5. Relative frequencies of compositional groups of possible ceramic production and satellite sites.

hindered by variation introduced by the sample preparation and/or analyses. Additionally, there is significant contamination of the ceramics as result from how they were prepared for digestion. Consequently, several elements were not included in the interpretation because of contamination and/or issues with incomplete digestion—including Cr and Ta which one of us (RJS) has found to be particularly important discriminating elements for ceramic studies in the American Southwest.

If we reexamine all ceramic data generated by Watkins for the Parowan Valley sites (Parowan, Summit, and Paragonah), it is clear that pottery from Paragonah is chemically distinct from pottery from Parowan and Summit (Figure 5). There are two possibilities for the difference: (1) the differences are a consequence of analytical error introduced by the ICP-MS sample preparation and/or analyses or (2) the differences are real and therefore chemically distinct compositional groups of pottery indeed exist in the Parowan Valley. Furthermore, if we make the logical assumption that pottery was moved (or traded) among the Parowan Valley sites, then it seems possible (assuming the ICP-MS data have integrity) that pottery denoted in cluster A and B represent compositional groups indicative of pottery produced at the Parowan and Summit sites. Clearly, it would be informative to have the Parowan Valley sample reanalyzed by INAA for direct comparison with the dataset generated for the Kern River

Expansion project.

Variation by Geographic Area

As discussed above, other studies of ceramic constituents conducted in the region indicate that non-local ceramic types are sometimes copied and produced with local materials. Ceramics identified as Snake Valley series that had been manufactured with local materials have been documented in places like the Great Salt Lake area and Baker Village in Nevada (Richens 1999; Simms et al. 1997:789; Watkins 2006). East Fork Village provides an opportunity to determine whether similar patterns are apparent in southwestern Utah. Although East Fork Village is within the known distributional limits of the Snake Valley Black-on-gray ceramics, the site is outside of the type's core area (Madsen 1977). Eighty-nine percent of the shards recovered at the site are classified as Sevier Gray, based on microscopic examination of temper. Snake Valley series ceramic types also were identified on the basis of microscopic examination of temper and by macroscopic inspection of surface treatments and decorations. None of the Sevier Gray shards were subjected to INAA. Obvious differences in temper, however, make it clear that none of the shards classified into the Snake Valley series are compositionally similar to the shards classified as Sevier Gray. The Snake Valley series shards from the site appeared microscopically similar to Snake Valley series ceramics identified at other project sites to the south. More importantly, INAA demonstrates that the Snake Valley series shards from East Fork Village are dominated by compositional groups that are represented at other project sites to the south (Figure 3). This suggests that the Snake Valley series ceramics recovered at East Fork Village were obtained through an exchange system, rather than copied by local potters.

Use of analytic methods such as INAA that are capable of differentiating fine-grained compositional groups have the potential to identify sites or site clusters where ceramics were manufactured. If ceramics are manufactured at or near a site, that site's ceramics should be dominated by pottery manufactured from the local materials because of the energy expenditure required to transport ceramics or their raw materials. As Arnold (1985) has shown, ethnographic accounts of pottery manufacturing indicate that raw ceramic materials are usually procured within a few kilometers of the production site. Archaeological studies tend to support the ethnographic observations. Samples of 30 Mesa Verde Black-on-white bowls were selected for INAA from Sand Canyon Pueblo and Castle Rock Pueblo west of Cortez, Colorado, and from Mug House and Long House in Mesa Verde National Park by Glowacki and colleagues (D.

M. Glowacki 1995; D. M. Glowacki, Hector Neff, and Michael D. Glascock 1995; Glowacki 1998; see also Glowacki 2002) and (Pierce et al. 2002). Clay from geologic sources near these sites was also included in this study. The analyses revealed that ceramics made from clays from sources near the sites were more common than ceramics made from nonlocal clays (Pierce et al. 2002:199). Glowacki determined that more than 50 percent of the ceramics sampled were produced from locally available clays in three of the four cases.

Of this project's sites, only the Fallen Eagle site has revealed direct evidence of ceramic production, in the form of a probable kiln. Ceramics from the Fallen Eagle site should, therefore, clearly be dominated by a single compositional group. As shown in Figure 3, the ceramics subjected to INAA from contexts within the Fallen Eagle site contemporaneous with the kiln are, indeed, dominated by a single compositional group: Group 2. Of the sample of 11 analyzed shards, six are classified as Group 2.

Prior to analysis, the Evans Mound site was considered as a possible locus of ceramic production because abundant ceramic artifacts were recovered there and because the site was probably a primary residential site, inhabited more intensively than most other Fremont sites in the area (see Berry 1974; Dodd 1982). Based on ceramic densities, Watkins (2006:78) suggests that the Parowan Valley was the primary locus of Snake Valley series pottery production, though he does not single out the Evans Mound site.

As shown in Figure 3, the Evans Mound INAA sample is not dominated by a single compositional group; Groups 4, 5, 6, and 7 are represented in similar frequencies. That a single compositional group is not dominant suggests that ceramic production did not occur at the Evans Mound site. It should be noted, however, that Group 4 is found only at Evans Mound. Although it is only represented by five shards, it is a very distinctive group and a viable candidate for local production.

Group 7 is the only compositional group present in the ceramic samples from all project sites. The occurrence of significant quantities of compositional Group 7 ceramics at all the study sites may have important ramifications for studies of trade. As indicated by Speakman and Glascock (2005), given the number of unique compositional groups identified by INAA, it is unlikely that a chemically homogenous clay source occurs throughout western Utah. This would seem to indicate that Group 7 pottery was produced from a geographically restricted clay source and suggests the presence of a site or set of sites near a common clay source that produced ceramic vessels for trade. The makers of Group 7 ceramics were specialists, as they produced more goods than could be consumed by their own community (Plog 1995). The potters at the site or set of linked sites that produced Group 7 ceramics manufactured plain gray, corrugated, and painted vessels in sufficient quantities to supply the seven project sites along a 221-km-long (138-mile) segment of the pipeline corridor. It is possible that Group 7 vessels were even traded farther to the north, but no sites there were included in this study.

The identification of Group 7 Snake Valley series ceramics as a key element of Fremont exchange raises the question, "Where were Group 7 ceramics produced?" It would be expected that the relative frequencies of Group 7 ceramics would be highest near the production source and diminish with distance from the source. Group 7 shards comprised eight of 10 shards from the Scorpio site (42WS2434), suggesting that it might be near the production area. The next highest relative frequency of Group 7 shards, however, occurs at East Fork Village (42MD974), where half of the 10 specimens were identified as Group 7. East Fork Village and the Scorpio sites are the farthest apart of the sites in the INAA study. As mentioned, the East Fork Village ceramic sample is dominated by Sevier Gray ceramics, so it probably was not the production locus of Snake Valley series ceramics. In any case, the relative frequencies of Group 7 ceramics are not sufficiently patterned to determine the vicinity of production. It is speculated that Group 7 ceramics were manufactured at a large Fremont site where residential mobility was relatively low, such as the large architectural sites along the edge of the Parowan Valley. This interpretation seems feasible because the scale of Group 7 ceramic production seems to have been a relatively large endeavor. A less residentially mobile group would be able to produce more pots than a more mobile group because they would have had prolonged access to the Group 7 raw material sources, would have had more storage facilities for vessels prepared for trade, and would have been more consistently available for those seeking trade, such as at trade fairs. Additional ceramic analysis is needed to identify the production locus of Group 7 ceramics.

It seems likely that some of the compositional groups infrequently represented among the study's sites may have been manufactured for local use, rather than for exchange. Compositional Groups 3, 4, and 8 occurred only at single sites. Compositional Groups 1, 2, 5, and 6 were identified at multiple sites, but not at all sites in the study. They may have been produced mostly for local use, with limited production for trade, or may have been manufactured at distant ceramic production locations and simply seldom entered the vicinity of the project area.

Variation by Site Mobility

Previous studies using X-ray diffraction have shown that variation in ceramic composition tends to increase as length of site occupation decreases (Bright et al. 2005; Simms et al. 1997). These authors suggest that more residentially mobile groups manufactured their own pottery, and that the variation in materials reflects encountering a wide range of natural resources during their travels. Less residentially mobile groups, on the other hand, tended to use a restricted number of material sources close to their primary habitation sites.

Although the INAA sample is small, this project's data do not conform to those produced by studies using X-ray diffraction. Of the seven sites in the study, two sites, Evans Mound and East Fork Village, can be classified as long-term residences. Four compositional groups were identified within the ceramic samples from both sites. Two sites, Fallen Eagle and Hunchback Shelter, may be classified as shorter-term residential bases. As discussed above, a house pit was identified at the Fallen Eagle site, which represents a smaller labor investment than the substantial architecture present at Evans Mound and East Fork Village. Hunchback Shelter has natural shelter and evidence of intensive occupations, so may have been occupied at lengths similar to the Fallen Eagle site. Two compositional groups were identified at the Fallen Eagle site, and four were identified at Hunchback Shelter, for a group average of 3 compositional groups. Neither residential architecture nor substantial middens were identified at the Mud Springs, Tony Takes a Hike, or Scorpio sites. These three sites are thought to represent shorter-term site occupations. The ceramic sample from the Mud Springs site had four compositional groups and both the Tony Takes a Hike and the Scorpio sites each had two compositional groups, for a group mean of 2.7 compositional groups. The apparent trend of decreasing compositional variability with decreasing length of occupation may be due to stochastic error, as larger INAA samples were generally processed from the residential sites. The short-term occupations also tended to be characterized by small quantities of ceramics. A total of 433 shards was recovered at the Scorpio site, and only 78 were found at the Tony Takes a Hike site. The low numbers suggest that few vessels were present; few vessels would yield evidence of limited compositional variability. The Mud Springs site, on the other hand, yielded only 127 shards, yet four compositional groups were represented. Overall patterning is unclear, and additional sampling will be necessary to define the patterns. It seems probable, however, that the many short-term campsites and processing locations will be characterized by very low disposal rates of ceramics, which will result in low compositional diversity.

CONCLUSIONS

Application of INAA to Snake Valley series ceramics has demonstrated a high degree of compositional variability within the core area of Snake Valley pottery production. Seven compositional groups, thought to represent discrete geologic sources of raw ceramic materials, were identified among shards that appeared similar under microscopic inspection. The high degree of compositional variation was also recognized within Snake Valley ceramic types, such as Snake Valley Gray, Snake Valley Black-on-Gray, and Snake Valley Corrugated. All types appear to have been manufactured at various locations in southwestern Utah. Analysis has also demonstrated that Snake Valley series ceramics were part of intra-regional exchange, as evidenced by the Snake Valley series shards analyzed from East Fork Village. East Fork Village occurs in an area dominated by Sevier Gray pottery, rather than Snake Valley Gray. The relatively small quantities of Snake Valley Gray collected there, however, are compositionally similar to sites in the study to the south, within the core area of Snake Valley series production.

The analysis provided limited information about the location of ceramic production. Only one site, the Fallen Eagle site, was purported to represent a manufacturing loci, as evidenced by a pit feature interpreted as a kiln. The ceramics from the site were dominated by a compositional group that was not represented at any other project site, supporting site interpretations. It was expected that other long-term residential sites, especially Evans Mound, might also have served for pottery production, and so would be dominated by one or two compositional groups. That was not the case. A diverse set of compositional groups was represented in the Evans Mound sample. It is possible that future analysis will, indeed, show that pottery was produced at sites such as Evans Mound. If Evans Mound served as a central place for exchange (sensu Janetski 2002) and pottery "flowed" both in and out of the site in the exchange process, then such trade centers might be routinely characterized by a high degree of compositional diversity.

The importance of ceramic exchange in southwestern Utah is demonstrated by the occurrence of substantial percentages of Group 7 materials at all project sites. Ceramics with the Group 7 materials were apparently manufactured within a limited area, yet were widely exchanged. This suggests production by specialists, who produced more ceramics than their own community could consume (Plog 1995).

Obviously, our understanding of Fremont ceramic production and trade can benefit from additional INAA research. By subjecting large samples of ceramics to INAA, from sites widely scattered across southwestern Utah, it may be possible to identify ceramic production sites or production tracts. Clay sources also should be included in future INAA studies, so that ceramic materials can be directly tied to geologic sources. Once ceramic production loci are identified, patterns of Fremont ceramic exchange can be further illuminated.

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REFERENCES CITED

Arnold, D. E.

1985 *Ceramic Theory and Culture Process*. Cambridge University Press, Cambridge.

Berry, Michael S.

1974 The Evans Mound: Cultural Adaptations in Southwestern Utah. Master's thesis, Department of Anthropology, University of Utah, Salt Lake City.

Bishop, Ronald L., Robert L. Rands, and George R. Holley

1982 Ceramic Compositional Analysis in Archaeological Perspective. In *Advances in Archaeological Method and Theory, vol 5*, pp. 275-330, Academic Press, New York.

Bright, Jason, Steven R. Simms, and Andrew Ugan

2005 Ceramics from Camels Back Cave and Mobility in Farmer-Forager Systems in the Eastern Great Basin. In *University of Utah Anthropological Papers*. vol. 125. The University of Utah Press, Salt Lake City, Utah.

Dodd, Walter A., Jr.

1982 *Final Year Excavations at the Evans Mound Site*. University of Utah Anthropological Papers, Number 106. University of Utah Press, Salt Lake City.

Glascock, Michael D.

1992 Characterization of Archaeological Ceramics at MURR by Neutron Activation Analysis and Multivariate Statistics. In *Chemical Characterization of Ceramic Pastes in Archaeology*, edited by Hector Neff, pp. 11-26, Prehistory Press, Madison, WI.

Glascock, Michael D., Hector Neff and Kevin J. Vaughn

2004 Instrumental Neutron Activation Analysis and Multivariate Statistics for Pottery Provenance. In *Hyperfine Interactions*, pp. 95-105. vol. 154 (1-4).

Glowacki, Donna M.

1995 *Patterns of Ceramic Production and Vessel Movement in the Mesa Verde Region.*, M.A. Thesis, Department of Anthropology, University of Missouri, Columbia.

Glowacki, Donna M., Hector Neff, and Michael D. Glascock

1995 Characterization of Mesa Verde Black-on-white Ceramics from Southwestern Colorado Using NAA. *Journal of Radioanalytical and Nuclear Chemistry, Articles 196*:215-222.

1998 An Initial Assessment of the Production and Movement of Thirteenth Century Ceramic Vessels in the Mesa Verde Region. *Kiva* 63:217-240.

Glowacki, Donna M., Hector Neff, Michelle Hegmon, J. Kendrick, and W. James Judge

2002 Chemical Variation, Resource Use, and Vessel Movement in the Northern San Juan Region. In *Ceramic Production and Circulation in the Greater Southwest: Source Determination by INNA and Complementary Mineralogical Investigations*, edited by Donna M. Glowacki and Hector Neff, pp. 66-73. Cotsen Institute of Archaeology, UCLA, Los Angeles.

Hendricks, J.D., Forsyth, D. & Jung, C.

1990 X-Ray diffraction analysis of some Formative and Late Prehistoric pottery from Utah. In *Hunter-Gatherer Pottery From the Far West*, edited by J. Mack. Carson City: Nevada State Museum Anthropological Papers 23, 29-52.

Janetski, Joel C.

2002 Trade in Fremont society: contexts and contrasts. *Journal of Anthropological Archaeology* 21:344-370.

Kennett, Douglas J., Atholl J. Anderson, Michael J. Cruz, Geoffrey R. Clark, and Glen R. Summerhayes

2004 Geochemical Characterization of Lapita Pottery via Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). *Archaeometry* 46:35-46.

Little, Nicole C., Laura J. Kosakowsky, Robert J. Speakman, Michael D. Glascock, and Jon C. Lohse

2004 Characterization of May Pottery by INAA and ICP-MS. *Journal of Radioanalytical and Nuclear Chemistry,* 262:103-110.

Lyneis, Margaret M.

1994 Ceramics Recovered from the Survey Phase of the Kern River-Utah Project: Concordance and Discussion. In *Kern River Pipeline Cultural Resources Data Recovery Report, Appendix 9-2*. Prepared by Dames and Moore, Las Vegas, Nevada. Prepared for Kern River Gas Transmission Company, Salt Lake City. Submitted to the Bureau of Land Management, Salt Lake City.

Madsen, Rex E. (editor)

1977 *Prehistoric Ceramics of the Fremont*. Museum of Northern Arizona Ceramic Series No. 6. Museum of Northern Arizona, Flagstaff, Arizona.

Neff, Hector

1994 RQ-mode Principal Components Analysis of Ceramic Compositional Data. In *Archaeometry 36*, pp. 115-130.

2001 Synthesizing Analytic Data - Spacial Results from Pottery Provenance. In *Handbook of Archaeological Sciences*, edited by D. R. Brothwell and A.M. Pollard, pp. 733-747. John Wiley and Sons, Chichester, England.

2002 Quantitative Techniques for Analyzing Ceramic Compositional Data. In *Ceramic Source Determination in the Greater Southwest*, edited by Donna M. Glowacki and Hector Neff. Cotsen Institute of Archaeology, UCLA, Los Angeles.

Pierce, Christopher, Donna M. Glowacki, and Margaret M. Thursday

2002 Measuring Community Interaction: Pueblo III Pottery Production and Distribution in the Central Mesa Verde Region. In *Seeking the Center Place: Archaeology and Ancient Communities in the Mesa Verde Region*, edited by Mark D. Varien and Richard H. Wilshusen, pp. 185-202. University of Utah Press, Salt Lake City.

Plog, Stephen E.

1995 Paradigms and Pottery: The Analysis of Production and Exchange in the American Southwest. In *Ceramic Production in the American Southwest*, edited by Barbara J. Mills and Patricia L. Crown, pp. 30-62. The University of Arizona Press, Tucson.

Reed, Alan D., Matthew Seddon, and Heather Stettler (editors)

2005 *Kern River 2003 Expansion Project, Utah. Volumes I-VII.* Prepared by Alpine Archaeological Consultants, Inc., Montrose, Colorado and SWCA Inc., Salt Lake City, Utah. Prepared for Kern River Gas Transmission Company, Salt Lake City, Utah. Submitted to Bureau of Land Management, Salt Lake City, Utah.

Richens, Lane D.

1999 Baker Village Ceramic Analysis. In *Baker Village: Report of Excavations, 1990-1994*, edited by James D. Wilde and Reed A. Soper. Museum of Peoples and Cultures Technical Series No. 99-12, Brigham Young University, Provo, Utah.

Simms, Steven R., Andrew Ugan and Jason R. Bright

1997 Plain-Ware Ceramics and Residential Mobility: A Case Study from the Great Basin. *Journal of Archaeological Science* 24:779-792.

Speakman, Robert J., and Michael D. Glascock

2005 Instrumental Neutron Activation Analysis of Fremont Pottery from the Kern River Expansion Project, Utah. Volume III Appendix E. In *Kern River 2003 Expansion Project*, edited by A.D. Reed, M. Seddon, and H. Stettler. Alpine Archaeological Consultants, Inc., Montrose, Colorado, and SWCA Environmental Consultants, Salt Lake City. Submitted to the Bureau of Land Management, Salt Lake City.

Steponaitis, Vincas, M. James Blackman, and Hector Neff

1996 Large-Scale Compositional Patterns in the Chemical Composition of Mississippian Pottery. *American Antiquity* 61:555-572.

Stokes, Wendy L., Ken Lawrence, Matthew T. Seddon, Alan Hutchinson, Jason Bright, Sonia Hutmacher, Jim Hasbargen, Joshua S. Edwards, Scott B. Edmisten, Robert Herrmann, Trevor R.

Lindland, Rachael Gruis, Jo'Etta Buckhouse, Krislyn Taite, James McMillan, and Thomas Sharp

2001 The Fallen Eagle Site (42BE1988). In *History and Prehistory Along the San Pedro, Los Angeles, and Salt Lake Railroad: Results of Archaeological Investigations for the Level (3) Communications Fiber Optic Line from Salt Lake City, Utah to the Utah/Nevada Border. Volume V: Excavations at the Deep Stone Site*

LATE PREHISTORIC POTTERY: TOWARD A CERAMIC TRADITION IN THE SOUTHEASTERN GREAT BASIN

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Late Prehistoric Ceramics in the southeastern Great Basin have often been considered highly variable. These ceramics are presumably material remains left behind by Numic speaking groups such as the Southern Paiute. Madsen (1986) argued that these Numic speakers spread northward, entering southern Utah by A.D. 1100 or earlier and reaching northern Utah by about A.D. 1300. However, Madsen based this claim on radiocarbon dates from multi-component rockshelters, which can have problematic stratigraphy. More reliable dates have since been obtained, which suggest that this spread may have actually occurred significantly later than proposed by Madsen. In addition, these ceramics are not as highly variable as has been suggested and reflect some cultural cohesion.

INTRODUCTION

Late Prehistoric ceramics within the southeastern Great Basin have often been noted as highly variable. For example, after examining ceramics from the Kern River Project in southwestern Utah, Margaret Lyneis noted that, "The constituents at each site are different" (Lyneis 1994:1). Additionally, David Madsen argued that these ceramics "are the most poorly defined of all Great Basin ceramics" (Madsen 1986:209).

Late Prehistoric ceramics in the Great Basin and surrounding regions have been given many different names—presumably based on regional variations—including Southern Paiute Utility Ware, Intermountain Brown Ware, Great Basin Brown Ware, Shoshone Brown Ware, and Ute or Uncompahgre Brown Ware, outside the Great Basin (Firor 2005:709). Some of these classifications assume a cultural affiliation that has yet to be verified (Janetski 1990:63). Often, these varieties are lumped into three broad categories: Southern Paiute Utility Ware, Shoshoni Brown Ware, and Owens Valley Brown Ware (Pippin 1986:11). This paper is only concerned with the geographic area generally associated with Southern Paiute Utility Ware.

LATE PREHISTORIC CERAMICS

Madsen attributed Late Prehistoric pottery to Numic Speakers assumed to have spread into the Great Basin over the past millenium (Madsen 1975:82; Madsen 1986:213. HOwever it is been pointed out that these brown wares had not been sufficiently dated at the time (Pippin 1985:15). Madsen based his argument on dates from Lost City, Stuart Rockshelter, O'Malley Shelter, Pine Park Shelter, Slivovitz and Avacado Shelters, as well as seveal surface finds along the Utah and Nevada border. Some of the southernmost of these sites dated as early as AD 700, and Madsen argued for the spread of Numic speakers into Southern Utah by at least AD 11-1200, and into northern Utah by about AD 1200-1300 (Madsen 1986:213). Madsen illustrated this Numic Spread model with a map and dates from sites in the region. The radiocarbon dates recovered from these sites represented the best dates for Late Prehistoric ceramics that were available at that time. However, these dates are questionable because they come from multi-component rockshelters, which are prone to problematic stratigraphy.

Recent projects provide radiocarbon and thermoluminesence dates to pursue this question further. These dates can add to Late Prehistoric chronology, and help refine the distribution of these ceramics in the Great Basin.

Baldwin (1950) noted the similarities among brown ware pottery throughout the Great Basin and beyond. "It is likewise evident that Southern Paiute pottery ties in closely with other Shoshonean pottery and with Ute, Navaho, and Western Apache utility ware and that it is also affiliated with the general Woodland type" (Baldwin 1950:55).

Nonetheless, there appears to be significant variation in Late Prehistoric ceramic morphology. As Lyneis argued, "The variation in them is not strongly patterned, and a hierarchical classification into wares and types such as the one that lends structure to Anasazi ceramics does not work for these highly variable, practical ceramics" (Lyneis 1994:22). On the Kern River Project, there were no particular features distinguishing Southern Paiute Brown Ware from the brown ware ceramics found within Ute territory (Lyneis 1994:23). Additionally, ceramic styles traditionally associated with the Southern Paiute (those with conical bottoms) have been proven to extend into areas beyond Southern Paiute boundaries (Janetski 1990:54).

Three brown ware vessel forms are usually identified in the southeastern Great Basin: those with flat bottoms, those with round bottoms, and those with conical bottoms (Pippin 1986:10). Flat-bottom vessels are typically associated with the Shoshone, and are generally found in areas north and west of the sites considered in this analysis (Janetski 1994:165) and are therefore not represented in this paper. The conical vessel below (Figure 1) was found in southern Nevada on the border between Southern Paiute and Western Shoshone territory (Tuohy 1986:35). Many rounded vessels also have pointed bases as illustrated below.

Figure 1. Conical vessel found in southern Nevada (from Tuohy 1986:35)

Forming techniques appear to be fairly universal for brown ware ceramics. These vessels were created by coiling, although there were some variations in techniques used to smooth these coils. Smoothing occurred by either scraping techniques or by use of paddle and anvil techniques. Generally vessel interiors received greater smoothing than the exteriors (Janetski 1994:164). The making of brown ware ceramics has traditionally been attributed to a mobile people, produced in small numbers and intended for immediate use (Lyneis 1994:1). This assumption is based in part on the relatively low expenditure that was put into making and decorating these ceramics. Hence, the name "utility ware" has reference to the practical purpose of these ceramics (Lyneis 1994:22).

Simms et al (1997) argued that the level of investment into ceramic manufacturing is directly related to the level of mobility of the manufacturers: increased investment generally equates to an increased level of sedentism. However, in contrast, Jelmer Eerkens (2003) effectively demonstrated that brown ware representative of mobile groups in the western Great Basin was smaller at the mouth, thinner, and had a rougher exterior surface finish than brown ware from sedentary groups.

There are two issues to be considered in this survey. The first involves dating and chornological aspects of brown ware ceramics in southwestern Utah. The second concerns characteristics that can distinguish the presence of a widespread ceramic tradition, or the lack any cohesive cultural connections. These cultural connections can be represented in vessel form, rim eversion, surface treatment, and firing technique in Late Prehistoric ceramic vessels from

SAMPLE AND METHODS

Moon Ridge (n = 302)

Moon Ridge is located near Fish Lake in central Utah, which is on the western edge of the Colorado Plateau (Figure 3). Moon Ridge is a particularly interesting site because it contains artifacts that span from Archaic to historic times. Four areas of Moon Ridge were excavated; however, only areas 2 and 3 yielded Late Prehistoric ceramics (Janetski et al. 1999:227). Excavations in Area 2 recovered a total of 302 Late Prehistoric sherds. Preliminary analysis by Bradshaw (1996) found that 85 percent are fingernail impressed, and they range in color from reddish-brown to dark brown and seem to represent globular vessels with pointed bottoms. One slightly flaring rim sherd was also present.

Sand Hollow Project (n = 238)

The Sand Hollow Project (Figure 2) was a salvage archaeological project in preparation for the construction of Sand Hollow Reservoir. A total of 853 potsherds were collected in the Sand Hollow Basin, 238 of which fit into the Late Prehistoric category (Talbot and Richens 2002:279). Ninety percent of these sherds have fingernail or stick impressed exterior surfaces.

These Late Prehistoric sherds range in color from brown or reddish-brown to dark gray or black. Many of the sherds were small, revealing little about vessel form other than that they are all from jars. One jar was partially reconstructed, revealing a slightly flaring rim with a diameter of 22 cm. This vessel appears to be globular in shape with a rounded bottom. One sherd appears to also be from a globular vessel, and several others suggest that vessels had large open mouths

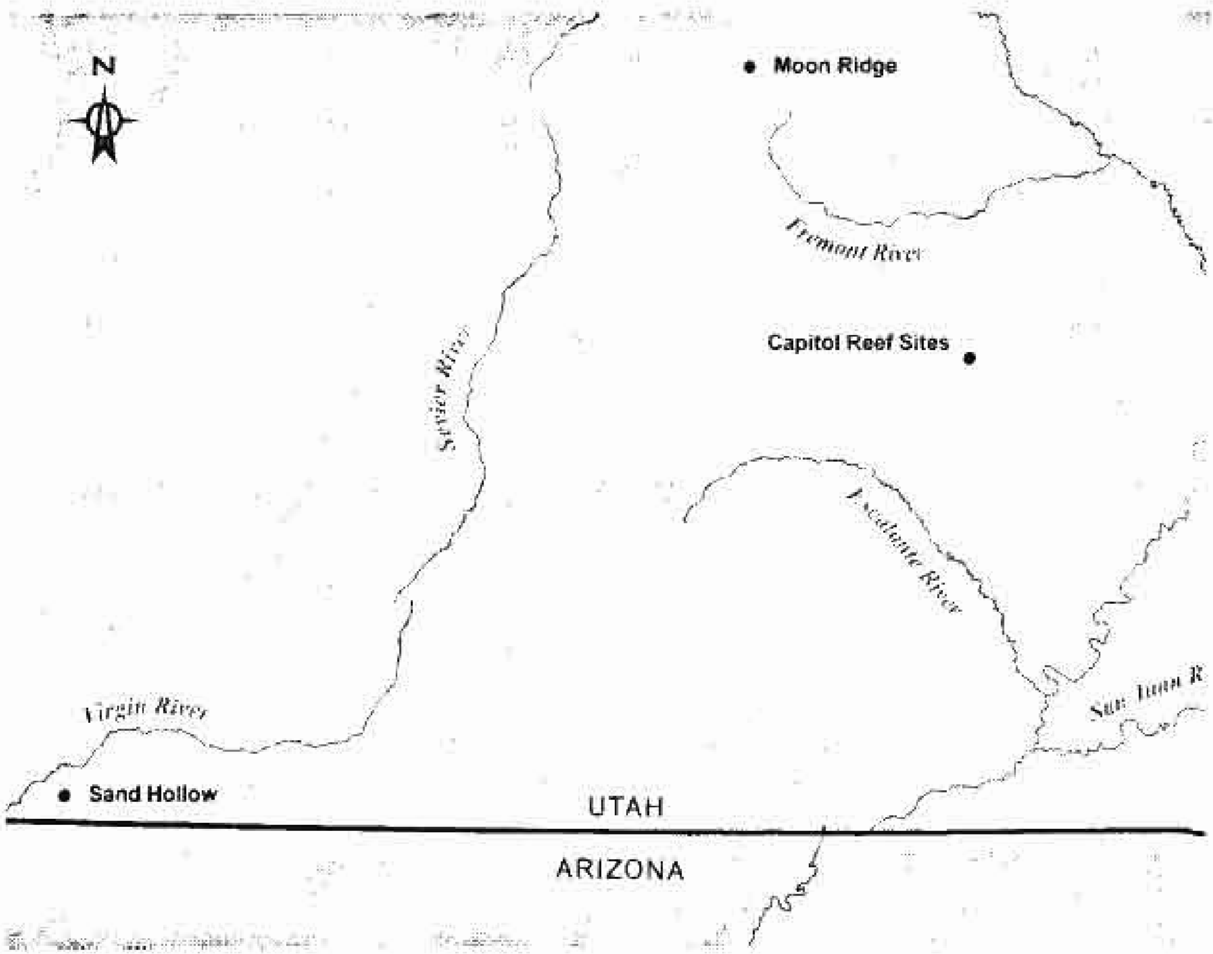


Figure 2. Locations discussed in the text.

(Talbot and Richens 2002:287).

Kern River Project

Brown ware ceramics recovered from the Kern River Project were described as "characteristically coarse in texture" with color ranging from reddish brown to almost black (Lyneis 1994:24). Because most of the brown ware sherds recovered were small, little could be discerned about vessel shape. However, Lyneis pointed out that the Late Prehistoric vessels in this region are either conical, or globular with rounded or pointed bottoms, and none of the sherds from the Kern River Project exhibit curvature that typically resembles that found on conical vessels (Lyneis 1994:28). Additionally, there are no sherds representing pointed bottoms (Lyneis 1994:36). Although this does not necessarily mean that no vessels with pointed bottoms were present, it is probable that these vessels were globular with rounded bottoms. Fifteen rim sherds were also recovered representing 6 different vessels. There is little variation in the degree of eversion among these sherds and all are slightly flaring (Lyneis 1994:28). Although no specific counts are given, Lyneis noted that fingernail impressions were the most common form of surface treatment (Lyneis 1994:30).

Kern River 2003 Expansion Project (n = 681)

During the Kern River 2003 Expansion Project, a total of 681 Late Prehistoric potsherds were collected from five different sites, all in Washington County: 42WS1247, 42WS1459, 42WS1460, 42WS1579, and 42WS2453 (Firor 2005:710). Although exact patterning of the impressions varied, all five sites contained sherds exhibiting fingernail impressions (Firor 2005:710). However, numbers of impressed sherds were few compared to those having only scraped exteriors. At site 42WS1459, known as the Springhead Site, 90 Late Prehistoric ceramic sherds were found, half of which exhibited fingernail-impressed exteriors (Lindsay 2005:343). The majority of the sherds found during the expansion project are from the Monkey's Paw Site (42WS1460), at which 569 Late Prehistoric sherds were found (Firor 2005:711). These sherds consisted of mostly body sherds, the overwhelming majority of which had plain undecorated surfaces. In addition, vessel shape was largely indeterminate due to the small size of the sherds (Lindsay 2005:350, 352, 355). Site 42WS1579 likewise contained mostly body sherds of indeterminate vessel form, the majority of which exhibited scraped exterior surfaces (Lindsay 2005:369, 370, 372). No discussion of rim eversion is present anywhere in the report from this project.

Capital Reef (n = 11)

During surveys conducted in Capital Reef National Park (Figure 3), eleven Late Prehistoric potsherds were collected from the surface of seven different sites. It was reported that almost all of these sherds exhibited fingernail impressed exteriors. Since all of these sherds were small body sherds, no conclusive information was obtainable regarding vessel form. However, these sherds had black interiors and exteriors that range in color from brown to black (Janetski et al 2005:180).

Arnold (1985) stated that vessel form and style are the most important features to examine in order to make inferences about ethnicity and culture because they represent cultural, stylistic, and utilitarian preferences.

> ...The unit of ceramic behavior most useful in the identification of cultural process is not the abstract type, but the vessel shape. Vessel shapes are behaviorally significant to a culture and can provide important behavioral data about the society. Cultural change can be identified in a society when new shapes enter or leave the ceramic repertoire through time. New shapes suggest new utilitarian or religious uses for ceramics which provided a 'kick' for deviation amplifying feedback for the craft (pp. 234).

In an attempt to distinguish possible connections between Fremont and Anasazi populations, Janetski (2005) has also argued that style is the most essential concept in ethnic studies based on material remains. Analysis of temper and clay materials is useful for determining the locations where pots were constructed (Arnold 1985:232) but less useful in ethnic studies. Some brown ware types, such as "Death Valley Brown Wares," have even been defined based on tempering materials (Hunt 1960). However, this distinction is useless in terms of this analysis because it is likely that temper materials will vary from one region to another based on available resources, especially if the assumption is true that brown ware ceramics were made by a highly mobile people. Therefore, an analysis of tempering and clay materials is not undertaken in this study. As previously mentioned, this study examines 1) vessel form, 2) rim eversion, 3) surface treatment, and 4) firing technique.

There is an admitted sampling bias within this study for two reasons: first, the ceramics analyzed in this paper may or may not be a sufficiently large enough sample to represent the region as a whole; second, most of the sherds analyzed are small and few reveal much about vessel form. Therefore, in this study, relatively few sherds represent vessel form.

RESULTS

Radiocarbon and Thermoluminescence Dates

Radiocarbon dates from Area 2 of Moon Ridge suggest that the area was occupied during the AD 1600s (Janetski et al. 1999:228). Because area 3 had a mixture of both Late Prehistoric and Anasazi ceramics, radiocarbon dates from this area were not examined in this analysis.

Unfortunately, all brown ware ceramic assemblages from the Sand Hollow Project were also found in contexts mixed with Anasazi ceramics. Although no single component sites were found during the Sand Hollow Project that date to the Late Prehistoric period, four radiocarbon dates from the Sand Hollow Basin associated with Late Prehistoric ceramics date from the late 1500s to the late 1700s (Talbot and Richens 2002:51, 59, 74, 170, 289).

Thermoluminescence and radiocarbon dates are available for three of the five sites from the Kern River 2003 Expansion Project: 42WS1459, 42WS1460, and 42WS1579. Each of these three sites had earlier components that will not be examined in this paper. Four dates were recovered from brown ware sherds from site 42WS1459; these dates range from as early as AD 1612 to as late as AD 1843. Site 42WS1460 has fifteen thermoluminescence dates, the earliest dating to between AD 1314 and 1428, and the latest dating between AD 1570 and 1910. Six brown ware ceramic dates from site 42WS1579 range from as early as AD 1209 to as late as AD 1808 (Lindsay 2005:336).

Capital Reef.

No radiocarbon dates are available from the Kern River Project that can be associated with Late Prehistoric ceramics; however, these sherds are believed to date to after 450 years B.P. (Lyneis 1994:38). Additionally, no radiocarbon dates are available in association with the sherds from Capital Reef (Janetski et al 2005:180).

Radiocarbon and thermoluminescence dates available from Moon Ridge, the Sand Hollow Project, and the Kern River 2003 Expansion Project consistently range between the AD 1300s and historic times. The majority of these dates range between the 1500s and the 1800s. Only one thermoluminescence date, with a range of AD 1209 to 1467, can be seen as possibly earlier than the year AD 1300 (Lindsay 2005:336). All available radiocarbon dates from unmixed Late Prehistoric components in this study are listed below in Table 1.

Madsen pointed out that brown ware ceramics are known to have a wide range of surface treatments, from rough, poorly scraped to a well-smoothed finish (Madsen 1986:209). These ceramics can safely be lumped into two main categories: plain or impressed (fingernail or stick impressed). Occasionally, corrugated brown ware vessels are found in this region as well (Firor 2005:710; Tuohy 1990:100). The overwhelming majority of brown ware ceramics from Moon Ridge and the Sand Hollow Project exhibit some form of impressed surface treatment. At Moon Ridge, 85% of sherds were impressed (n = 255) and 15% were plain (n = 47). Sherds from the

Table 1. Available radiocarbon and thermoluminescence dates from Late Prehistoric site components.

Site	2-Sigma Calibration	Probable Occupation	TL-date
Moon Ridge, 42SV2229 (Beta-87894)	AD 1460-1950	AD 1650	N/A
Moon Ridge, 42SV2229 (Beta- 75140)	1635-1950	AD1700s	N/A
Crucible Site, 42WS1579, (Protohistoric 15)	N/A	N/A	AD 1675-1737
Crucible Site, 42WS1579, (Protohistoric 1)	AD 1440-1640	N/A	N/A
Crucible Site, 42WS1579, (Protohistoric 2)	AD 1450-1950	N/A	N/A
Crucible Site, 42WS1579, (Protohistoric 3)	AD 1460-1950	N/A	N/A
Crucible Site, 42WS1579, (Protohistoric 4)	N/A	N/A	AD1209-1467 AD 1521-1637 AD 1553-1607 AD 1707-1763
Monkey's Paw Site, 42WS1460 (Protohistoric 2)	AD 1220-1620 AD 1460-1640 AD1490-1790	N/A	AD 1604-1780 AD 1726-1774 AD 1730-1868 AD 1802-1860 AD 1836-1874
Monkey's Paw Site, 42WS1460 (Protohistoric 3)	N/A	N/A	AD 1592-1738
Monkey's Paw Site, 42WS1460 (Protohistoric 5)	N/A	N/A	AD1840-1870
Monkey's Paw Site, 42WS1460 (Protohistoric 6)	N/A	N/A	AD1814-1846
Monkey's Paw Site, 42WS1460 (Protohistoric 7)	N/A	N/A	AD 1554-1600
Monkey's Paw Site, 42WS1460 (Protohistoric 8)	N/A	N/A	AD 1775-1903
Monkey's Paw Site, 42WS1460 (Protohistoric 11)	N/A	N/A	AD 1314-1428
Monkey's Paw Site, 42WS1460 (Protohistoric 12)	N/A	N/A	AD1836-1858
Monkey's Paw Site, 42WS1460 (Protohistoric 13)	N/A	N/A	AD 1570-1910
Springhead Site, 42WS1459 (Feature 2)	AD1426-1524 AD1561-1629	N/A	N/A
Springhead Site, 42WS1459 (Block C)	N/A	N/A	AD 1612-1662 AD 1630-1694 AD1685-1759 AD 1793-1843

Sand Hollow project were also overwhelmingly impressed (90%, n = 212). Unfortunately, other areas included in this analysis did not have specific counts of this information available, and therefore are not included here.

Although the ceramics from Moon Ridge and Sand Hollow seem to exhibit similar ratios of exterior surface treatments, Late Prehistoric ceramics recovered from the Kern River 2003 Expansion Project reveal an entirely opposite ratio of plain/impressed brown wares (Lindsay 2005:343, 369, 370). As a result, neither of these surface variations appears to have been preferred over the other and both are common to the same geographic region. Therefore, both plain and fingernail impressed ceramics seem to be common throughout the southeastern Great Basin during the Late Prehistoric Period. Yet these two surface variations appear to be the only two utilized for Late Prehistoric ceramics in the southeastern Great Basin, which is consistent with the findings of Baldwin (1950). However, unlike Baldwin, I believe that these two styles are not significantly different enough to divide brown ware ceramics into differing sub-groups (Baldwin 1950:55). Additionally, the mixed distribution of these two variations does not allow for such divisions based on geographic location.

Unfortunately, the data presented here reveal little about Late Prehistoric ceramic vessel form. The small number of sherds in this study that were large enough to make inferences about vessel form may be inherently biased; however, they reflect a dominance of globular vessels with wide rims and either pointed or rounded bases. Unfortunately, no conical vessels were represented in this study, although they have been found at other sites in this region (Betenson 1999:5). Perhaps they reflect a less common variation of vessel form. For anyone interested in more examples of general Brown Ware vessel forms from this region, several examples are illustrated in Jennings 1978.

Although there is some color variation in the Late Prehistoric ceramics here examined, these variations actually express more similarities than differences. The ceramic colors present at all of the sites here examined universally include shades of brown, reddish brown, gray, and black. The reddish color exhibited by many of these sherds hint at an oxygen-rich firing process. The variation in ceramic color seems to be the result of poorly controlled firing commonly used in the area. "In open firing, the atmosphere continually changes during different stages of combustion and with shifting draft and air currents....Unevenness in pottery colors reflects the fluctuations in firing atmosphere that result from shifting air currents and the differential presence of gases and flames around the vessels" (Sutton and Arkush 1996: 114). This lack of control is likely the result of firing ceramics over an open fire.

CONCLUSION

The data summarized above lead to two main conclusions. First, more accurate dates have contributed greatly to our understanding of Late Prehistoric ceramics in recent years. The earliest dates in this study for Late Prehistoric ceramics in the southeastern Great Basin are in the 1300s A.D. and dates this early are few in number. This is considerably later than proposed by Madsen, who suggested that brown wares reached the southwestern corner of Utah by about 1100 A.D. as a result of the Numic Spread.

Second, although there is some variation among Late Prehistoric ceramics, there are also enough similarities to suggest the presence of a cultural ceramic tradition. This tradition can be characterized as globular jars with conical or rounded bottoms and wide rims (and conical vessels, although none were examined in this study), plain or fingernail impressed exterior surfaces, slightly flaring rims, and firing in an uncontrolled environment resulting in a variety of colors from brown to reddish-brown to black.

Lyneis argued that brown ware ceramics from the eastern Great Basin could not be categorized to represent different social groups (Lyneis 1994:30). While this argument appears to be well founded, Late Prehistoric ceramics do not appear to be as widely variable as she has claimed. These ceramics seem to exhibit enough similarities to suggest a cohesive ceramic tradition in the southeastern Great Basin extending into the western Colorado Plateau. Hopefully this synopsis will in the near future be compared with Late Prehistoric ceramic data from additional sites. As always, additional research is necessary in order to reach more definitive conclusions.

REFERENCES CITED

Arnold, Dean E.
1985 *Ceramic Theory and Cultural Process.* Cambridge University Press, London.

Baldwin, Gordon C.
1950 The Pottery of the Southern Paiute. *American Antiquity* 16(1):50-56.

Betenson, Britt J.
1999 Pottery and Mobility: A Functional Analysis of Intermountain Brownware. Unpublished Masters Thesis, University of Nevada, Las Vegas.

Bradshaw, Jenifer
1996 Transitions in Ceramic Technology at Fish Lake. Paper presented at the 25th Great Basin Anthropological Conference, Kings Beach, California.

Eerkens, Jelmer
2003 Residential Mobility and Pottery Use in the Western Great Basin. *Current Anthropology* 44(5):728-738.

Firor, James
2005 Ceramic Synthesis. In *Kern River 2003 Expansion Project: Utah,* Volume 4, edited by Alan D. Reed, Mathew T. Seddon, and Heather K. Stettler, pp. 709-727. SWCA Environmental Consultants, Salt Lake City.

Hunt, Alice
1960 *Archeology of the Death Valley Salt Pan, California.* University of Utah Anthropology Papers No. 47, Salt Lake City.

Janetski, Joel C.
2005 Fremont-Anasazi Interaction in the Escalante Basin. Paper presented in the Fremont Symposium, Pecos Conference, Bluff, Utah.

1994 Recent Transitions in the Eastern Great Basin: The Archaeological Record. *Across the West: Human Population Movement and the Expansion of the Numa*, edited by D.B. Madsen and D. Rhode pp. 157-178. University of Utah Press, Salt Lake City.

1990 *Ethnicity and Post-Formative Ceramics in the Eastern Great Basin.* Nevada State Museum Anthropological Papers No. 23: Hunter-Gatherer Pottery from the Far West. Nevada State Museum, Carson City.

Janetski, Joel C., Ganaver Timican, Douglas Timican, Rena Pikyavit, and Rick Pikyavit
1999 Cooperative Research between Native Americans and Archaeologists: The Fish Lake Archaeological Project. In *Models for the Millenium: Great Basin Anthropology Today*, edited by Charlotte Beck, pp. 223-237. University of Utah Press, Salt Lake City.

Janetski, Joel C., Lee Kreutzer, Richard K. Talbot, Lane D. Richens, and Shane A. Baker
2005 *Life on the Edge: Archaeology in Capital Reef National Park.* Museum of Peoples and Cultures Occasional Paper No. 11. Brigham Young University, Provo.

Jennings, Jesse D.
1978 *Historic Peoples*. University of Utah Anthropological Papers No. 98, Salt Lake City.

Lindsay, Clint
2005 Summary of Late Prehistoric/Protohistoric Period Investigations. In *Kern River 2003 Expansion Project: Utah*, Volume 4, edited by Alan D. Reed, Mathew T. Seddon, and Heather K. Stettler, pp. 333-378. SWCA Environmental Consultants, Salt Lake City.

Lyneis, Margaret M.
1994 Ceramics. In *Kern River Pipeline Cultural Resources Data Recovery Report: Utah,* Volume 1, (Draft), edited by W. Geoffrey Spaulding. Dames & Moore, (9)1-85. Las Vegas.

Madsen, David B.
1986 Prehistoric Ceramics. In *The Handbook of North American Indians*, Vol 11, Great Basin, edited by Warren L. D'Azevedo. Smithsonian Institution, Washington D.C., pp. 206-214.

1975 Dating Paiute-Shoshoni Expansion in the Great Basin. *American Antiquity* 40(1):82-86.

Pippin, Lonnie C.
1986 *Intermountain Brown Wares: An Assessment.* University of Utah Anthropological Papers No. 111, Salt Lake City.

Simms, Steven R., Jason R. Bright, and Andrew Ugan
1997 Plain-Ware Ceramics and Residential Mobility: A Case Study from the Great Basin. *Journal of Archaeological Science* 1997(24): 779-792.

Sutton, Mark Q. and Brook S. Arkush
1996 *Archaeological Laboratory Methods: An Introduction.* Kendall/Hunt Publishing Company, Dubuque.

Talbot, Richard K. and Lane D. Richens
2002 *Shifting Sands: The Archaeology of Sand Hollow.* Museum of Peoples and Cultures Technical Series No. 01-5. Brigham Young University, Provo.

Tuohy, Donald R.
1986 Eastern and Central Basin Ethnographic Specimens of Basin Brown Ware. In *Pottery of the Great Basin and Adjacent Areas*, Suzanne Griset, ed. University of Utah Anthropological Papers No. 111, pp. 27-36. University of Utah Press, Salt Lake City

1990 *Second Thoughts on Shoshoni Pots from Nevada and Elsewhere.* Nevada State Museum Anthropological Papers No 23, Carson City.

AVOCATIONISTS' CORNER

THE HIGHLAND CABIN SITE

Richard L Hansen, Utah Statewide Archaeological Society, Utah County Chapter, Pleasant Grove, Utah

The historic Highland Cabin Site is the oldest known cabin in Highland, Utah. Archaeological investigation of the site revealed historic means of putting out fires and storing perishables. The simplest techniques to put out a fire are to throw dirt on it or pour water on it, but the cabin site included a sixty-year old fire extinguisher. Historically, food was preserved by dehydration, storage in snow, ice boxes, or root cellars (Hackleman: 2005). Both of these concerns were addressed at the Highland Cabin.

HISTORICAL BACKGROUND

In the early homesteading years in Utah Valley, water was at a premium, so land changed hands frequently. In 1851, Lehi citizens dug a seven-mile ditch in order to capture some of the water coming out of American Fork Canyon. The residents of Highland widened the ditch to get a portion of the water for themselves. In 1913, the Provo River Water Users dug the Murdock Canal, which extended on the east and north sides of the Utah Valley. Residents of the Highland Bench bought shares of water from the Murdock Canal, which allowed them to develop farmland on the bench. After 100 years of settlement in the rural community, Highland City was incorporated in 1977.

Harry Savill built the cabin and the adobe addition on the back of the cabin (Figure 1) and dug a well. Later, a pioneer named John Van Streeter moved to Utah from the Netherlands in 1866. He bought the homestead in 1896. After Van Streeter and his family lived there for twelve years, he sold the land to William A. Bringhurst in 1908. Bringhurst then sold the property to Rufus J. Stice and his brother-in-law, Harvey Speer in 1912 (Tribune: 1995).

Figure 1. Cabin and addition at back.

Figure 2. Cabin at Highland City Park.

These two men purchased an additional 20 acres of the Van Streeter Farm from D. MacMillan. Three of the lots in this parcel of land contained the cabin lot. At the time of the archaeological investigation the site belonged to the Stice Family.

Rufus J. Stice had been transferred to Utah in 1900. He and his wife, Alice Speer, were married earlier that same year in Missouri where they had both been natives. Rufus was a telegraph operator for the Union Pacific Railroad, and became the station agent for Lehi in 1904. He stayed in this position for ten years. In 1912 he purchased the thirty acres where the cabin stood while his brother-in-law, Harvey Speer bought the adjacent thirty acres.

They farmed together until Harvey sold his land and moved to Iowa. Then Rufus J. worked a three-year stint in Tooele. He was transferred to American Fork as station agent, a position he held for twenty years.

The oldest son of Rufus J. Stice, Rufus Boyd Stice helped run the farms since her was 12. Rufus Boyd married Louise Roundy in 1926. Rufus Boyd and Louise remodeled the summer cabin and made this their first home. In 1936 Rufus Boyd was able to buy his first car. He supplemented his income from the farm by starting a Ford dealership in 1936 and running it until the beginning of WWII. Rufus Boyd earned his whole income from farming after 1942. Rufus Boyd purchased the land from his mother in 1943 when Rufus J. died. Rufus Boyd and Louise along with their three girls lived in the small cabin until 1953. In 1953 they moved into their new home nearer the road. After being owned by the family eighty years this property was sold to Jim Huggard in 1992 (Stice 1989; News 1943).

ARCHAEOLOGICAL INVESTIGATION OF THE HIGHLAND CABIN SITE

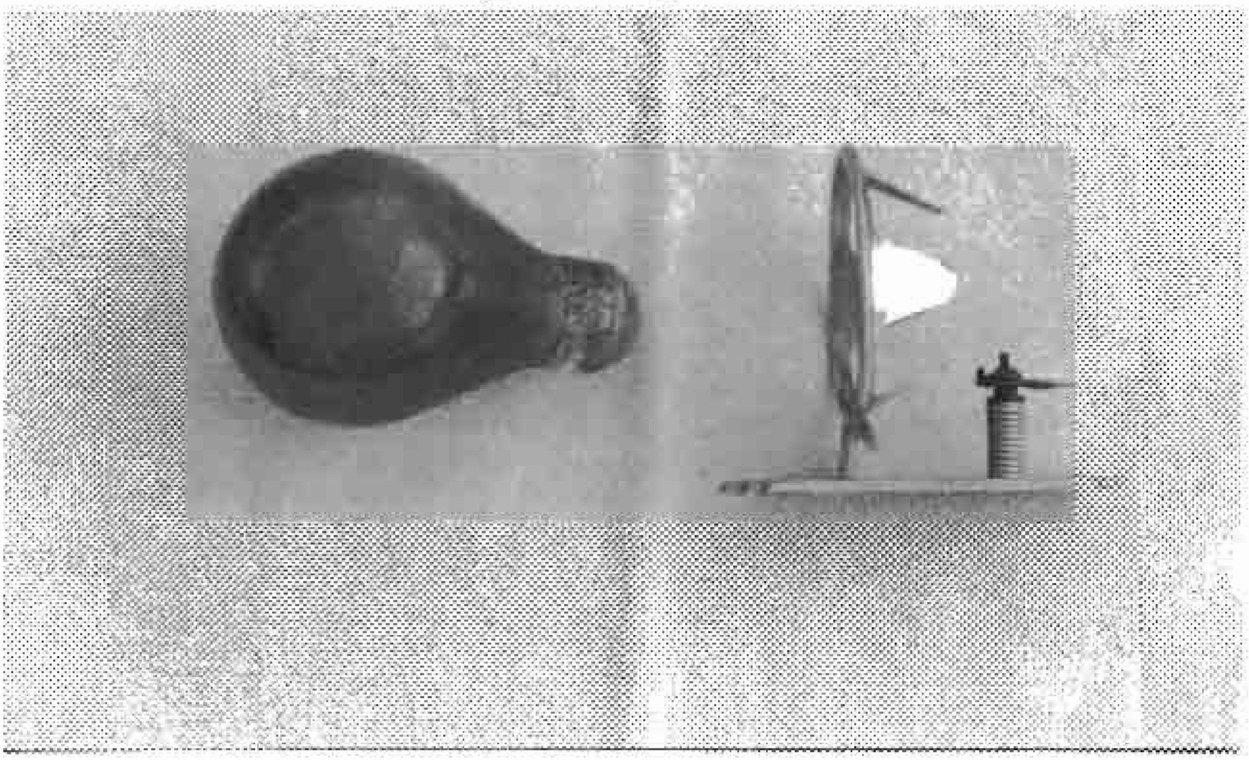
Between December 8, 1990 and July 15, 1991, inventory and limited test excavation were conducted at the Highland Cabin Site. The work was conducted by the Utah Statewide Archaeological Society (USAS). This project was directed by myself representing USAS in consultation with Don Southworth, Staff Archaeologist/Historian with the BYU Office of Public Archaeology (OPA). The work was completed at the request of the Highland Camp of the Daughters of the Utah Pioneers (HCDUP), when Louise Stice offered them the cabin for a museum.

The cabin was found under house siding by workmen tearing a house down before selling the property. One of the workmen who found the log cabin thought the cabin could be of historic value and stopped the work while he notified Mrs. Stice. She then notified the Highland Camp of the Daughters of the Utah Pioneers.

The resulting work at the site provided information about the everyday life and hustoric subsistence patterns at the site. The work was performed in four phases. First, tests pits were excavated to discover the porch footings and associated artifacts. Stratigraphic profiles were drawn to illustrate the depth of cultual deposits. Then, features adjacent to the cabin were investigated by placing test squares in otder to ascertain the horizontal spread and depth of cultural artifacts. These features included the property's outhouse and well, pluas an old tree stump. Next, test pits were excavated near the outside door and under the floor of the adobe addition. Finally, laboratory analysis and description of all features, artifacts and samples was completed. Artifacts were cleaned, labeled and catalogued (Olsen and Hansen 1992). At the conclusion of the archaeological investigation, the Highland Cabin was moved to the Highland City Park by the HCDUP (Figure 2).

Figure 3. Test pit by door.

Figure 4. "Fire grenade".



Test pits under the old, adobe addition discovered a wooden framework about five centimeters under the surface (Figure 3). Further excavation at this location revealed a wooden frame box. The dimensions of the box were: 3'10"x 3'8" on the sides and 20" deep. The wood pieces measured 2"x 4" in thickness (Figure 3). The soil inside the box had a foul odor, but it was rich in artifacts. Artifacts included a baby spoon, a shoe sole and heel, a clay marble, buttons, safety pins and an old newspaper. Vegetables and other food items could have been stored in this box, which would explain the foul odor. The glass buttons found here date to ca.1876 to 1910. The decomposed newspaper found in the top of the box had a date of December 16, 1974 (Olsen & Hansen 1992). These dates indicate that the cold box was in use from the time of the construction of the adobe addition in the 1890s until the Boyd Stice family moved to the new house in 1953. The old house was used for storage after that time explaining the newspaper dating to 1974. Personal conversations with the Stice family revealed that a trap door once existed in the wooden floor of the adobe addition. The Stice girls remember it being there when they used to play in this room, which was used as a kitchen (Personal communication 1991).

The icebox era in this portion of Utah Valley lasted from 1898 to at least 1932 (Carter 2005). Iceboxes were used when people would chop ice blocks out of Utah Lake and keep the blocks in well-insulated sheds. Pieces removed and taken to smaller insulated boxes inside the house to keep food cold.

If the cellar were built away from the house it would have to be placed deeper to avoid fluctuations of surface temperatures. When placed under the house, the house acts "as a buffer against surface-side temperature fluctuations" (Hackleman 2005:12). Hackleman goes on to say that root-cellaring can benefit garden produce by protecting it from extreme heat and also from freezing cold. Either temperature extreme could cause damage to the produce.

An interesting artifact was found upon investigating the interior of the log cabin itself. It was a glass globe set in a bracket on one wall near the ceiling (Figure 4). Upon further investigation the globe appeared to have a chemical in it. USAS member, Stanley Houghton, researched this artifact. Upon conducting personal correspondence with authority, Max Romero, he reported the following (Olsen & Hansen 1992:A2):

> Fire Extinguisher: "Fire Grenade"; 3" diameter and 5 ¾" long. It is bulb shaped and filled with carbon tetrachloride, a nonflammable vaporous liquid used as a fire extinguisher. This extinguisher was made by "Red Comet of Littleton Colorado". The company made this ca.1948.

If there were a fire, the heat would break the glass releasing the chemical. The chemical would then vaporize, creating a gas, which would smother the fire.

CONCLUSION

The fact that the salvage effort of many people and organizations helped preserve the historic cabin and associated artifacts was enhanced by information gained about the Stice family and the surprisingly delightful finds of the cold box and the fire grenade.

As already noted the Stice cabin has been moved to the Highland City Park where it sits as a museum (Figure 3). The artifacts from the site were cleaned and catalogued and sit in the cabin on display. The whole community got behind saving this important monument to the history of Highland. Fundraisers were given for the finances in moving the cabin. The Highland Camp of the Daughters of the Utah Pioneers and the Stice family are to be commended for preserving the cabin as a remnant of the Highland City heritage.

ACKNOWLEDGEMENTS

Thanks are given to the members of the Utah County Chapter of the Utah Statewide Archaeological Society for their many volunteer hours in working on the site and in artifact preservation. Rodney Horrocks deserves thanks for drawing the site map. The Highland City Council needs to be commended for the donation of the land where the cabin now stands. Special thanks need to be given to Kathryn Schramm of the DUP and Beth Olsen for work on the site's history. The archaeologists from the B.Y.U. Office of Public Archaeology especially Don D. Southworth , and Forest Service Archaeologist, Charmaine Thompson , should be thanked for their technical support.

REFERENCES CITED

Bel Air Volunteer Fire Company

2005 Fire Extinguishers. http://www.bavfc.org/fireextinguishers.htm. Retrieved February 27, 2005.

Carter, D. Robert

2005 "Ice business expands, then evaporates". Daily Herald, March 13, 2005.

Deseret News

1962 June 10, 1943; December 21, 1949; May 16,1962.

Durfey, David T.

1992 "Aberrant Mormon Settlers: The Homesteaders of Highland, Utah." Thesis. Harold B. Lee Library, Brigham Young University.

Hackleman, Michael

2005 Keeping your food cold: Solutions to refrigeration when electricity is scarce. Backwoods Home Magazine. http://www.backwoodshome.com/articles/hackleman56.html. Retrieved February 27, 2005.

Olsen Beth and Richard L. Hansen

1992 Highland Historic Log Cabin Archaeological Project. Ms. on file, Utah County Chapter of Utah Statewide Chapter Library, BYU, Provo, Utah.

Romero, Max

1992 Personal Correspondence. Letter in the possession of Mrs. Stanley Houghton.

Salt Lake Tribune

1955 May 15, 1955

Stice, Family

1991 Personal Discussions.

Stice, Rufus Boyd

1980 "Autobiography". Ms. in possession of Mrs. Louise Stice.

BOOK REVIEW

Troweling Through Time: The First Century of Mesa Verdean Archaeology by Florence C. Lister. Paperback: 288 pages. New Mexico University Press. $24.95

Reviewed by **Mark E. Stuart**, USAS Promontory/Tubaduka Chapter

One of the most scenic but rugged sections of the United States is the Colorado Plateau. It is a hard land and a tough place to try to earn a living. There is, however, scarcely a tract of it that does not bear some evidence of human occupation. Many of the Plateau's richest remains have been found in the Mesa Verde Region, which is centered in southwest Colorado and adjacent parts of Utah and New Mexico. In *Troweling Through the Past*, Florence Lister tells the story of the archaeology of this area. Lister writes in an engaging and lively style with the passion of one who not only loves the archaeology of Mesa Verde, but also has lived it. Many of the people and events she describes, she personally experienced with her husband, the late Robert C. Lister.

The archaeology of the northern edge of the Southwest began in 1849, with the discovery of Chaco Canyon by US Army Topographical Engineers. This was followed by the Wetherhill Brothers' discovery of the cliff houses of Mesa Verde. By the end of the nineteenth century, the pot hunting form of archaeology was well underway.

In 1907, Edgar Hewett, director of the School of American Research recruited three Harvard undergraduates to survey the ruins of the Colorado Plateau. These novices, including Sylvanus Morely, Alfred Kidder and John Fletcher, were followed by field workers whose names are just as legendary. Lister explains what these people found and what it all meant. She traces the archaeological story from the nineteenth century through the twentieth, during which time archaeology became a science and women gained acceptance in the profession.

The story continues into the twenty-first century with the work of the Crow Canyon Archaeological Center, which has taken the story of the Southwest beyond archaeology by inviting representatives of the modern Native American tribes in the region to offer their perspectives on the past.

Using not only technical scientific reports, but also gleaning the best from cultural resource management literature, Lister weaves this fascinating story. In laymen terms, this book deals with the contributions to the methods and concepts of archaeology that evolved in the Mesa Verde region, in accordance with reconstructions of the past. In Lister's own words (Preface XI) she states the purpose of her book: "Methods and perspectives in the gradual evolution of Southwest archaeology have changed as the culture of the observers has changed. Pot-hunting gave way to academician, relic collecting became artifact analysis and then consideration of behavioral patterns. A bewildering array vocabulary of technical terms appeared as scientific approaches grew more stringent and discrete. Archaeologists began to talk only to other archaeologists. Remote sensing and radiocarbon accelerator dating are in and computers and CD-ROMs are here to stay. But through it all, the trowel remains the symbol of the science. It is often given, gold-plated and inscribed as a Commendation because even in this electronic age, basic archaeology means digging in the dirt."

As Lister writes much has changed in archaeology, over time a few things have remained basically the same. The archaeologists' trowel is still an essential tool, as implied in the book's title. Therefore, I feel this book will be of interest to professional and amateur archaeologists and historians alike, as well as tourists of the Southwest with non-archaeological backgrounds. There is something in the book for everyone.

This is just not a book about Mesa Verde National Park, although it is the thread that ties the book together. Having worked on excavations in southeastern Utah and vacationed at Lake

Powell, one of my favorite sections of the book is Lister's account of the massive Glen Canyon Project in the 1950's and early 1960's by Jesse Jennings and the University of Utah. Also of great interest were the summaries of Lipe's work on Cedar Mesa, Utah and various other research projects conducted on the Great Sage Plain of southwestern Colorado.

Another valuable contribution of the book is the Pictorial Panorama of the first one hundred years of Mesa Verde archaeology. It has been said that a picture is worth a thousand words, and in this presentation, Lister illustrates the progress of Mesa Verde archaeology from its earliest beginning until now. I found it most helpful to not only read, but also see this gradual evolution over time.

One more incentive to read this book is the fact that all of the proceeds from this publication go to the Robert C. Lister Memorial Fellowship for Graduate Students in Southwestern Archaeology, administered by the Crow Canyon Archaeological Center.

Overall, I loved this book. I don't usually recommend archaeology books to my friends, because they often find them tedious and boring. But there is nothing boring about this book. Lister's style is exciting and engaging from the beginning, and reads like a well-written novel. I give this book a five-star rating and would recommend this book to anyone who is interested in the American Southwest and archaeology in general.

INSTRUCTIONS TO AUTHORS

UTAH ARCHAEOLOGY is published annually in the first quarter of the year following the issue date of the journal (e.g., *Utah Archaeology 1999* appears in March 2000). The journal focuses on prehistorie or historie archaeological research relevant to Utah. Articles must be factual with some archaeological applicatiou. We seek submissions from authors affiliated with government agencies, cultural resource management firms, museums, academic institutions, and avocational archaeologists equally.

Utah Archaeology uses a modified version of *American Antiquity* style, the journal of the Soeiety for Amcrican Arehaeology. Authors submitting manuscripts are requestcd to follow *American Antiquity* style, especially for reporting dates, measurcmcnts, headings, in-text citation, and rcferences. Either consult a previous issue of *Utah Archaeology* or sce the October 1992 issue of *American Antiquity*, which contains a complete style guidc and is available in many librarics. If you do not have access to a copy plcasc contact onc of thc cditors.

Categories of papers:
(1) Articles—Synthetic manuscripts, reports of analysis, overviews, and rcvicws of past research.
(2) The Avocationist's Corner—Topical articles written for the nonspecialist. Articlcs for this section are encouraged from avocational and professional archaeologists.
(3) Rcports, notes and comments—Shorter manuscripts including dcscriptive reports on focused topics; notcs or points of interest with a minimum of interpretive discussion; comments on current issues or previously published works. Commcnts on previously published works will be submitted to the author of that work for revicw and reply.
(4) Photo/illustrative essays—Photo or illustration-based articles with descriptive and/or interpretivc text to supplement the visual media.
(5) Book Reviews—Reviews of current publications pertaining to archaeology in Utah. This can include books based on other geographical areas, but with concepts or methods relevant to Utah archaeology. Book reviews on hiking guides and wilderness topics that contain some archaeology are also welcome.

Important points for authors:
(1) All manuscripts are submitted for outside review. Authors are sent reviewers' comments and a letter from the editor as to whether the manuscript is acceptable with revision, acceptable in current form, or rejected with a recommendation for substantial revision.
(2) Authors must submit one hardcopy of their complete manuscript including text in correct style, followed by tables, figures/photographs and bibliography. The hard copy is used for rcview purposes. Xerox copies of figures and photographs are acceptable for the hardcopy. Authors should ensure their references are complete; in thc case of unpublished works, use "Ms. on filc" to identify where the document can be found. Do not includc publications with no date (n.d.).
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