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UTAH ARCHAEOLOGY

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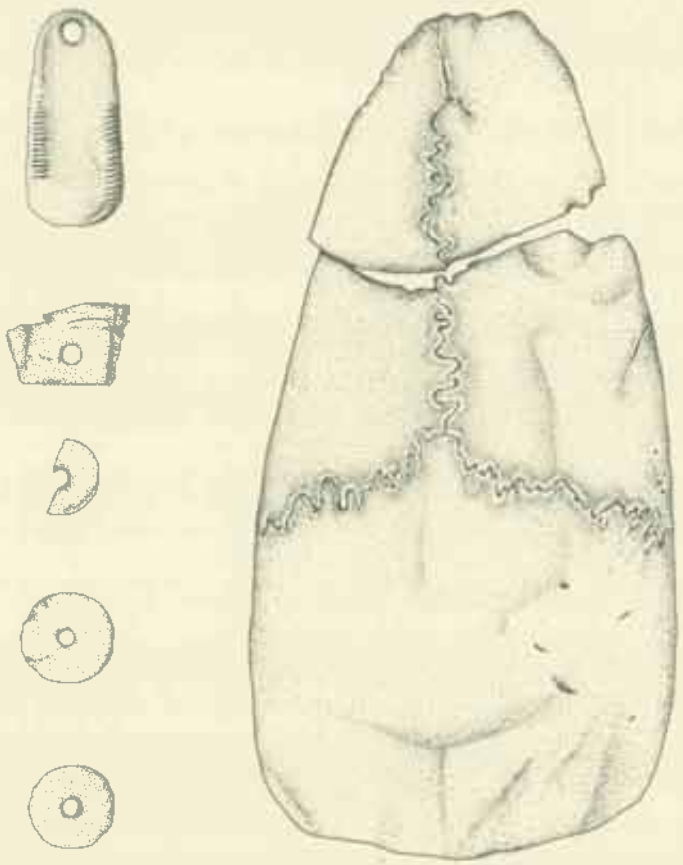

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Cover: Drawing of bone artifacts recovered from 42UN2580 (actual size). From "The Johnson Rockshelter (Site 42UN2580): An Analysis of Material Remains and Cultural Contexts of a Fremont Storage Site" by Ian C. Lindsay and Byron Loosle, p. 10. Drawing by Scott M. Ure.

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Message from the Editors

As was said by the first editors of *Utah Archaeology* in the inaugural issue:

"*Utah Archaeology* represents a considerable effort by the professional and amateur archaeological communities in the state to publish current local research in a quality format…The purpose of the publication is to disseminate information about historic and prehistoric archaeological research in Utah to the public, the avocationalist and the professional….Publication is the end result of archaeological research. Without the distribution of findings for the consumption of the interested public and professionals, archaeology is not being done."

We wholeheartedly agree with these sentiments and are excited to participate in the publication of this great resource. We of course support submissions from all interested parties, but would particularly encourage individuals in cultural resource management, government positions, students, and avocational archaeologists to submit their research. A huge amount of archaeology is being performed in Utah, and Utah Archaeology is the perfect outlet for this data.

We would also like to thank our reviewers for the current and upcoming issues, as some have performed double duty as we have tried to 'catch up' to the current year. We apologize for the somewhat thin nature of this issue, as one or two of the articles that were slated for publication could not make the deadline set by us in an attempt to get this issue out quickly for the membership. We hope you enjoy the Utah Archaeology Index that we have included at the end of this issue. As we put it together we were reminded of the many excellent articles, reports, essays, etc that have graced these pages. We would encourage everyone to peruse the index and see for yourself; there may be articles you missed the first time around or had forgotten about. We look forward to serving as the editors and hope you enjoy this issue of *Utah Archaeology*.

David T. Yoder
Chris N. Watkins

The Johnson Rockshelter (Site 42UN2580): An Analysis of Material Remains and Cultural Contexts of a Fremont Storage Site

Ian C. Lindsay and Byron Loosle

The Johnson Rockshelter is a large alcove located northwest of Vernal, Utah on Ashley Creek. The shelter has been explored by a number of professional and amateur archaeologists over the last century. A recent USAS excavation documented the site and found that during the Fremont era (around 880 A.D.) the entire interior of the alcove was converted into a storage facility where a variety of large pits were dug into bedrock and lined with clay. Although only storage features were uncovered, a variety of tools and other artifacts suggest that sometime during prehistory the alcove was not just used for storage and the interior may have been remodeled once during its use life. One proposed model for the cave's function suggests the valley's residents were seasonally mobile and temporarily abandoned the area to go hunting or for some other purpose, while leaving deposited goods securely stored.

The past five decades have witnessed exponential growth in the archaeological database of the Uinta Basin of northeastern Utah, particularly with regard to Fremont culture studies. Field expeditions initiated by cultural resource management and academic research programs are producing data from an increasingly wide range of time periods and geographic locations within the Basin. As field studies begin to focus on previously unsurveyed territories, and begin to rectify sampling biases in the database, it is important to expand the theoretical aspects of archaeological research as well. The academic research programs of the 1960s and 70s led by the University of Utah (e.g., Jennings 1978; Marwitt 1970; Sharrock and Marwitt 1967; Shields 1967) and to a lesser degree by the University of Colorado (e.g., Ambler 1966; Breternitz 1970), produced vast amounts of data in search of answers to historical questions related primarily to the origins and sudden disappearance of the Fremont phenomenon and how the Fremont should be properly defined.

While similar issues continue to surface intermittently, these questions have largely led to a theoretical stalemate. Fresh perspectives and new lines of inquiry are necessary if Fremont studies are to contribute to the corpus of data on formative societies. For instance, in the Uinta Basin, evidence for Fremont land use and resource acquisition have only recently been sought in high elevation sites, a portion of the landscape that was previously ignored (Johnson and Loosle 2002). Similarly, as Spangler (1995) and Yoder (2005) note, there has been very little attention paid in the past to the storage practices of the Fremont, which is surprising given its relevance to the otherwise well-worn topic of Fremont farming strategies.

The purpose of this study is to report on Fremont storage strategies at the Johnson Rockshelter site (42UN2580) as a case study for understanding regional economic practices within the Uinta Basin. We begin with a discussion of the Johnson Rockshelter, its ecological context, and previous documentation by early expeditions. We then proceed with a description of the materials uncovered at the site during recent excavations and set them within the broader context of Fremont storage features in the Uinta Basin. The

Figure 1. Overview of alcove before excavation. Note Pit 1 in bottom right.

data analysis from this site is designed to serve as a public documentation of the excavated materials, which we hope will fuel further theoretical discussions on how the Fremont interacted with their diverse ecological settings.

42UN2580 Project Overview

In October 1998, the Uinta Basin Chapter of the Utah State Archaeological Society, under the direction of then Ashley National Forest archaeologist Byron Loosle, recorded and excavated the Johnson Rockshelter site (42UN2580) in the Ashley Creek gorge north of Vernal, Utah. With permission from the landowner, Duayne Johnson of Salt Lake City, fieldwork was conducted over a period of six days. The landowner and other local residents had been aware of the site's presence for many years, and it was the fragile nature of the site and the remaining research potential that prompted the excavators to secure the site's information for the public record.

On the exposed surface of the site were the openings of five pit features, as well as a variety of other materials, including corn cobs and bedrock grinding slabs that suggested the site was likely a Fremont storage facility (Figure 1). However, further investigation of the site uncovered a wider range of artifacts than expected, as well as additional pit features, which may help to further illuminate Fremont storage practices and the nature of Fremont subsistence practices within the Uinta Basin.

Site Location

Site 42UN2580, hereafter referred to as "Johnson Rockshelter," is located northwest of Vernal, Utah, in the Ashley Creek gorge, one of the many arteries that drain the south face of the Uinta Mountains into the northern Uinta Basin. The Ashley Creek drainage runs from northwest to southeast through the Ashley Valley, emptying into the Green River. The site is located on the

west side of the drainage about 30 meters above Ashley Creek at approximately 6200 feet in elevation. The site is in an optimal location for a variety of subsistence activities since it is in between seasonally abundant resource zones both on the floor of the Uinta Basin and in the higher elevations of the Uinta Mountains. Horticultural activities could be supported by immediate access to arable lands (still exploited by modern farmers), and foraging activities could be carried out in adjacent ecozones.

Regional Physical Geography and Climate

Lying within the Colorado Plateau physiographic province, the Uinta Basin is located in the northeastern corner of Utah extending into northwestern Colorado. The basin measures approximately 100 miles east-west by 125 miles north-south, and the elevation of the central floor averages 5000 feet above mean sea level. The basin is framed by the Uinta Mountains to the north, the Wasatch Mountains on the west, and on the south by the Roan and Book Cliff formations of the Tavaputs Plateau. Portions of the basin are punctuated by large outcrops of the Weber Sandstone Formation created during the Middle Pennsylvanian, which has been eroded in areas to form shelters suitable for human habitation (Truesdale 1993); the Johnson Rockshelter is one such overhang.

The regional topography of the Colorado Plateau has a marked effect on the climate of the Uinta Basin, with lower heat extremes and higher cold extremes than the neighboring Great Basin due to the higher elevation (Olsen 1995; Peterson 1994). Mean annual temperatures for the Uinta Basin are 16° F in January and 64° F in July (Shields 1967). The number of frost-free days in the basin averages between 80 and 160 annually, while the average in the Uinta Mountains averages less than 40. Although strong winter storms from the Pacific Northwest occasionally advance into the Uinta Basin, most of the fronts are blocked by the Wasatch and Uinta Mountain ranges. Similarly, summer storms from tropical air masses originating in the Gulf of Mexico and the Gulf of California are largely contained within the Plateau by the mountain barriers. (Peterson 1994). Classified as a semi-arid climate, the basin receives a modern average of 8.5 inches of precipitation per year, though the southern portion of the basin averages closer to only 6 inches annually. In addition, the northern portion of the Uinta Basin receives more water than the south due to its proximity to the Uinta Mountains and the numerous drainages such as Ashley Creek that flow from them (Shields 1967). Localized topography also results in microclimates at varying elevations. For example, cold air trapped in valleys or drainages can result in fewer frost-free days and a shorter growing season than in the foothills or other areas where airflow is uninterrupted (Olsen 1995). This helps explain why the Ashley/Dry Fork area is typically warmer during the winter and usually escapes the notorious Uinta Basin inversions, while receiving more moisture and being slightly cooler during the summer months.

Located in the Upper Sonoran Life Zone, the area surrounding the Johnson Rockshelter is dominated by two general vegetation communities: riparian and cold desert shrub. Riparian community vegetation includes cottonwood, box elder, peach-leaved willow, silverberry, buffaloberry, rose, sandbar willow, and rubber rabbitrush. The cold desert shrub community consists of Utah juniper, oneseed juniper, bitterbrush, cheatgrass, rabbitbrush, shadscale, horsebrush, mat saltbush, and black sagebrush. Other species that are found in the ecozone include prickly pear cactus, big sagebrush, curly grass, desert pepper grass, and Indian rice grass. The fauna within the area is categorized as part of the Uinta Basin Province of the Northern Great Plains Faunal Area. A wide variety of animals are known to inhabit the region including mule deer, mountain sheep, antelope, elk, jackrabbit, cottontail, striped skunk, coyote, moose, bobcat, mountain lion, bear, and numerous rodents, snakes, and birds. Bison and wolf also were present until early historic times (Durrant 1952; Talbot *et al.* 1992).

Previous Research

Modern refuse found deep within the storage pits during the course of excavation, including cigarette butts, bottle caps, and soda can pull tabs, indicated that looting had occurred during the 1960s or 1970s. Further, in the past the site was included as part of systematic regional investigations by the Claflin-Emerson Expedition of the Peabody Museum in 1931 and again by Albert B. Reagan of the U.S. Indian Field Service in 1932.

The Claflin-Emerson Expedition was a multi-year archaeological reconnaissance program, whose goal in 1931 was to survey the Green River drainage region in northeastern Utah. In their report on site A 6-2, or "Big Cist Cave," they described the remains of three plaster and slab-lined cists as well as corn cobs and cedar bark cord. The mouth of the cave was 19.5 m wide. They noted the presence of pictographs on a stone on the shelter's floor, as well as grooves on a boulder that they interpreted as the result of axe sharpening. Significantly, they also noted that further excavation at the site was not desirable given that extensive digging had evidently already taken place within the cave (Gunnerson 1969:119-120).

A year later, Albert Reagan (1933) visited the region and described the same site as Cave 11 in his report. Reagan noted eight cists that had been previously disturbed. Like the previous expedition, he mentioned the tool sharpening grooves on a sandstone boulder and the presence of corn cobs at the site. However, he also mentioned fragments of burned jacal, which may have been used in the construction of structures within the cave (Reagan 1933:7). This was the last time formal research was recorded at the site.

Site Data

One of the project goals was to determine the extent of the damage to the site and levels of previous disturbance, while salvaging what material and information remained (Figure 2). It became clear that two smaller pits and three larger pits had been completely excavated in the past. There was also evidence in the larger pits that the previous excavators had even attempted to dig into the bedrock. Only one of the seven total pits (Pit 7) and the corner of another (Pit 5) appeared undisturbed. During the course of the excavations, it became increasingly clear that non-human agents have plagued the site as well. Pack rack nests, rodent droppings, and deer droppings testify to a level of animal activity not uncommon at rockshelter sites. One modern radiocarbon date from cedar bark in the seemingly undisturbed Pit 7 highlights the level of non-human disturbance at the site.

In addition, though the archaeological database in the Uinta Basin is growing, gaining access to private farm and ranch land in areas such as Ashley Creek and Dry Fork can be difficult depending on the disposition of landowners. However, in order to place the site within a broader settlement context, it is recommended that a survey of the surrounding properties be conducted in the future. The Johnson Rockshelter's close proximity to well known rock art sites such as the extensive panels at McConkie Ranch in Dry Fork suggests that the entirety of the Ashley Creek drainage system holds tremendous research potential into Fremont settlement, subsistence, and social organization. An analysis of the rockshelter site is an important first step, but it should be recognized that any conclusions drawn from this study are preliminary until further work is done in the area.

Initially an excavation grid was laid out from the primary datum. Once pit openings were identified, the feature was excavated independently of the grid. An attempt was made to excavate only a quarter or half of the pit initially so that a profile of the unexcavated fill could be drawn. This was problematic in the bell shaped pits where the entire opening was needed for someone to access the lower areas of the feature. Macrofossil, radiocarbon, and pollen samples were only collected from the bottom and edges of undisturbed contexts. All material was screened through 1/8 inch screen and materials were bagged according to grid or feature. All cultural and organic material from

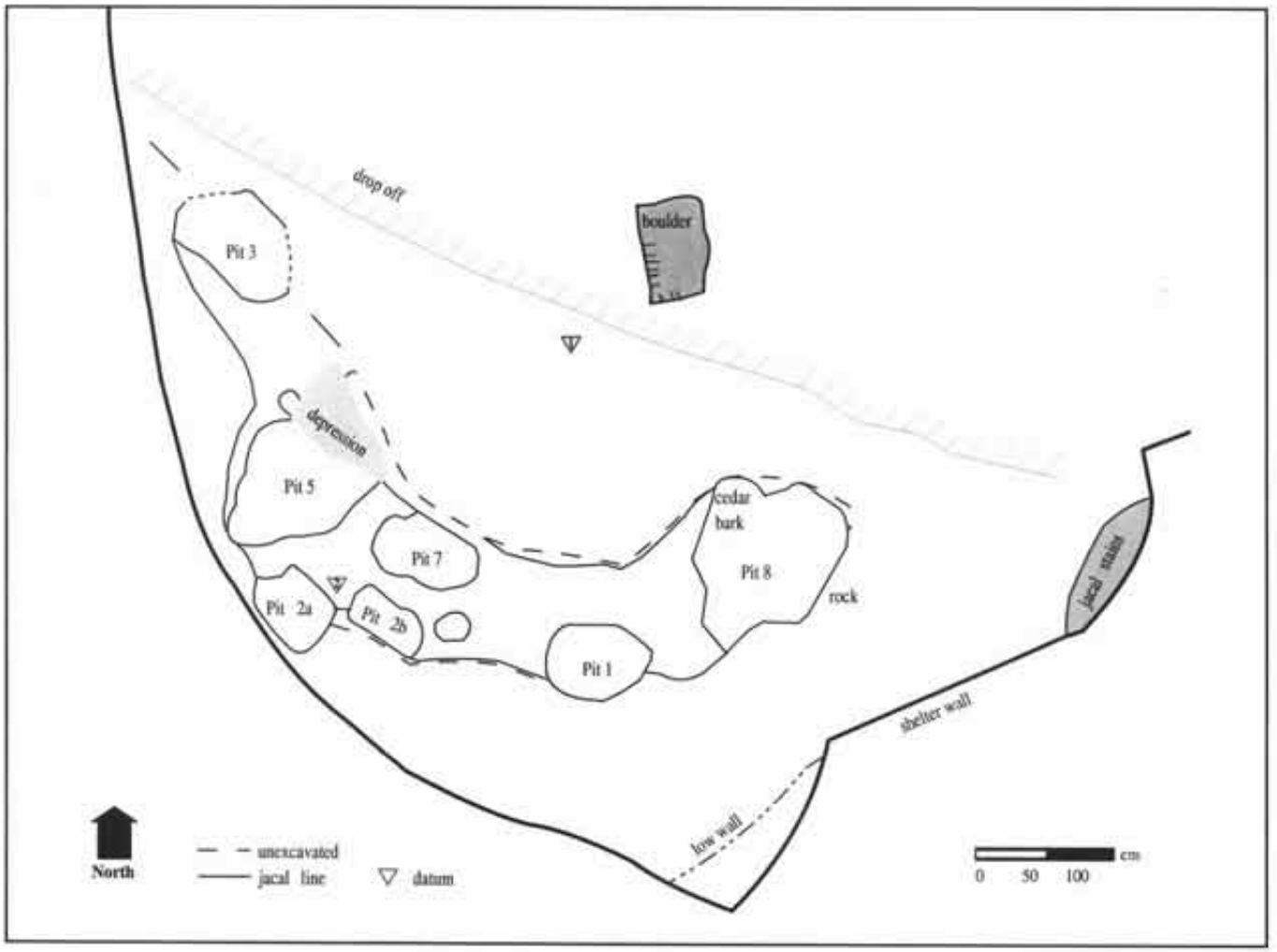

Figure 2. Plan map of alcove interior.

the excavation was collected, except for jacal. A representative sample of jacal measuring about 1 x 0.5 x 0.5 meter was gathered, but representing probably less than 15% of the jacal pieces noted during the excavation. Pieces were selected that contained impressions of various branch sizes and orientation and several were gathered that appear to have enough bark detail to allow identification of the wood species used in construction.

Material Culture Analysis

Radiocarbon Dates

Two samples of organic material have thus far been submitted to Beta Analytic for radiocarbon dating. Sample 42UN2580IS74 (Beta-126917) was a piece of cedar bark that was given extended counting time, but returned a modem date (post 0 BP, 120.4 ± 0.8%). The sample was collected in Pit 7, the undisturbed pit. We hoped that it represented an ancient pit lining, but now realize it was probably modern rodent nesting material. Sample 42UN2580IS34 (Beta-126916) was a charcoal sample dated to cal A.D. 880 (2 sigma: cal A.D. 720-735 and 760-985; 1 sigma: cal A.D. 790–905 and 920–950). This sample was collected from the undisturbed floor contact at the north end of Pit 5. This latter date fits comfortably within the timeframe of A.D. 500 to 1300 in which the

Table 1. Summary of Recovered Lithic Artifacts

Raw Material	Debitage	Retouched Flakes	Flake Tools	Projectile Points	Other Bifaces	Totals
Basalt	5	–	–	–	–	5
	3.6%					3%
Chert	23	–	–	–	–	24
	16.8%					16%
Sheep Creek quartzite	51	–	–	–	–	51
	37.2%					36%
Tiger chert	58	1	1	1	3	63
	42.3%	100%	100%	100%	67%	45%
Totals	137	1	1	1	3	143

Fremont are traditionally considered to have inhabited the Uinta Basin.

Lithic Material

A total of 143 pieces of lithic material were recovered from surface and subsurface contexts during the course of the project (summarized in Table 1). Debitage dominates the remains, although a few tools were also collected. All lithic material was sorted into material types based on visual attributes. The material types identified were Tiger chert, Sheep Creek quartzite, basalt, and undifferentiated chert.

Tiger chert comes from the Bridger Formation in southwestern Wyoming and northwestern Colorado. "Tiger chert is often dramatically banded cryptocrystalline toolstone, typically 'beer bottle' brown in color with fine tan banding." (Johnson and Loosle 2002:40). Banded material is quite common at Uinta Mountain sites, but in the Uinta Basin, further from the source, a uniform dark brown color is nearly ubiquitous perhaps suggesting that only the highest quality toolstone was carried such a great distance. Tiger chert represents about 44 percent of the total lithic material recovered at the Johnson Rockshelter. Although transported considerable distance this high quality material frequently occurs in Uinta Basin collections.

Sheep Creek quartzite is a light colored material that is known to have been important to inhabitants of the north slope of the Uinta Mountains. This material is a well-cemented, fine-grained quartzite that occurs in a variety of colors. Deposits of this material were extensively quarried in prehistory from near Sheep Creek Canyon and its drainages on the north slope of the Uinta Mountains, approximately 50 km from Ashley Creek (Johnson and Loosle 2002:39–40). Sheep Creek quartzite represents about 36 percent of the total lithic material recovered at the Johnson Rockshelter.

Undifferentiated chert and basalt comprise smaller percentages of the assemblage. None of the major categories of chert material that outcrop in the Uinta Basin were represented in the collection. Basalt is not available locally and is rare in the Uinta Basin.

Debitage. A total of 137 pieces of debitage represent about 96 percent of the lithic material at the site. Each flake was weighed and measured for length, thickness, and width using the methods described in Andrefsky (1998:97–100). Debitage was sorted into flaking stages following the standards as described in the Intermountain Antiquities Computer System (IMACS) User's Guide (1992).

No lithics in the primary stages of reduction were recovered, and 88 percent of the debitage were tertiary. The debitage is almost equally divided between non-local Tiger chert (42%) and Sheep Creek quartzite (37%). The fairly high proportion

of these materials compares well with the frequency at the Merkley Butte site (42UN1816), the only other professionally excavated site on Ashley Creek and located about 1.5 km downstream from the Johnson Rockshelter. Merkley Butte represents one of the latest and largest Fremont village sites investigated in the Uinta Basin. Located on a butte overlooking Ashley Creek, the site contained as many as 25–30 residential structures from an occupation that dates to about A.D. 1160 (Loosle and Koerner 1998).

The distribution of material types at Merkley Butte and Johnson Rockshelter has some similarities. At both sites Tiger chert constituted the most common material type, 56 percent at Merkley Butte and 42 percent at Johnson Rockshelter. At Merkley Butte, 43 percent of the debitage consisted of Sheep Creek quartzite, and at Johnson Rockshelter, Sheep Creek quartzite made up 37 percent of recovered debitage. All Sheep Creek quartzite flakes at Merkley Butte were tertiary, and 78 percent are tertiary at Johnson Rockshelter. Flake size by weight is comparable as well. The average Sheep Creek quartzite flake weight at Merkley Butte was 2.5 g, and at Johnson Rockshelter it was 2.8 g. These are fairly high when compared to sites on the north slope, closer to sources, where the average weight of debitage is around 1 g (Loosle 2000:287). All of the chipped stone tools at Johnson Rockshelter were made of Tiger chert, but only 33 percent at Merkley Butte. The single radiocarbon date obtained from Johnson Rockshelter places it 300 years prior to the occupation at the neighboring Merkley Butte site. The similarities between the Sheep Creek quartzite assemblages of the two suggests a similar procurement strategy, while the differences between the Tiger chert, especially in finished tools suggest some changes in Tiger chert use and procurement through time.

Stone Tools. A total of five chipped stone tools were recovered (Table 1), including a single Rose Spring corner-notched point. In addition to the projectile point, three bifaces (two complete and one fragment), a retouched flake, and a flake tool were recovered. These tools all appear to be made of Tiger chert (Figure 3).

Two pieces of groundstone were recovered from the site, both unifacial sandstone handstones. Additionally, a series of seven grinding slicks were recorded on a sandstone boulder near the opening of the rockshelter. The grinding slicks were likely what earlier expeditions to the site referred to as axe or tool sharpening grooves. Together, these features clearly indicate the presence of food preparation activities at the site.

Faunal Remains

The faunal remains analysis was conducted by Andrew Ugan of the Department of Anthropology at the University of Utah. A total of 645.0 g of bones was submitted for analysis, of which 213.8 g (33%) were identifiable. A variety of species were noted in the material (Table 2). Of the total, 48.3 g, primarily the larger bone, exhibited charring (Ugan 1998:Table 1). Cut marks were also noted on some specimens. Ugan concluded that:

> The faunal material from 42UN2580 is somewhat limited and little can be said about it. It contains the remains of a variety of large and small bodied mammals, birds, and a few reptile specimens. While the large bodied mammals are likely the result of human activities, the origins of the smaller specimens is open to debate. Limited evidence suggests that raptors may have been partially responsible for some of it (Ugan 1998:9).

Ugan (1998:2) argued that "in the absence of any measurement of aggregation affects, the computation of Minimum Numbers of Individuals (MNI's) is largely irrelevant and the information contained in the material can also be found utilizing NISP (Numbers of Identified Specimens); none of the material was sided and no attempt was made to determine numbers of individuals." Nearly 20 percent of the faunal remains were medium sized artiodactyl, which includes deer and mountain sheep. Since many of the smaller remains were

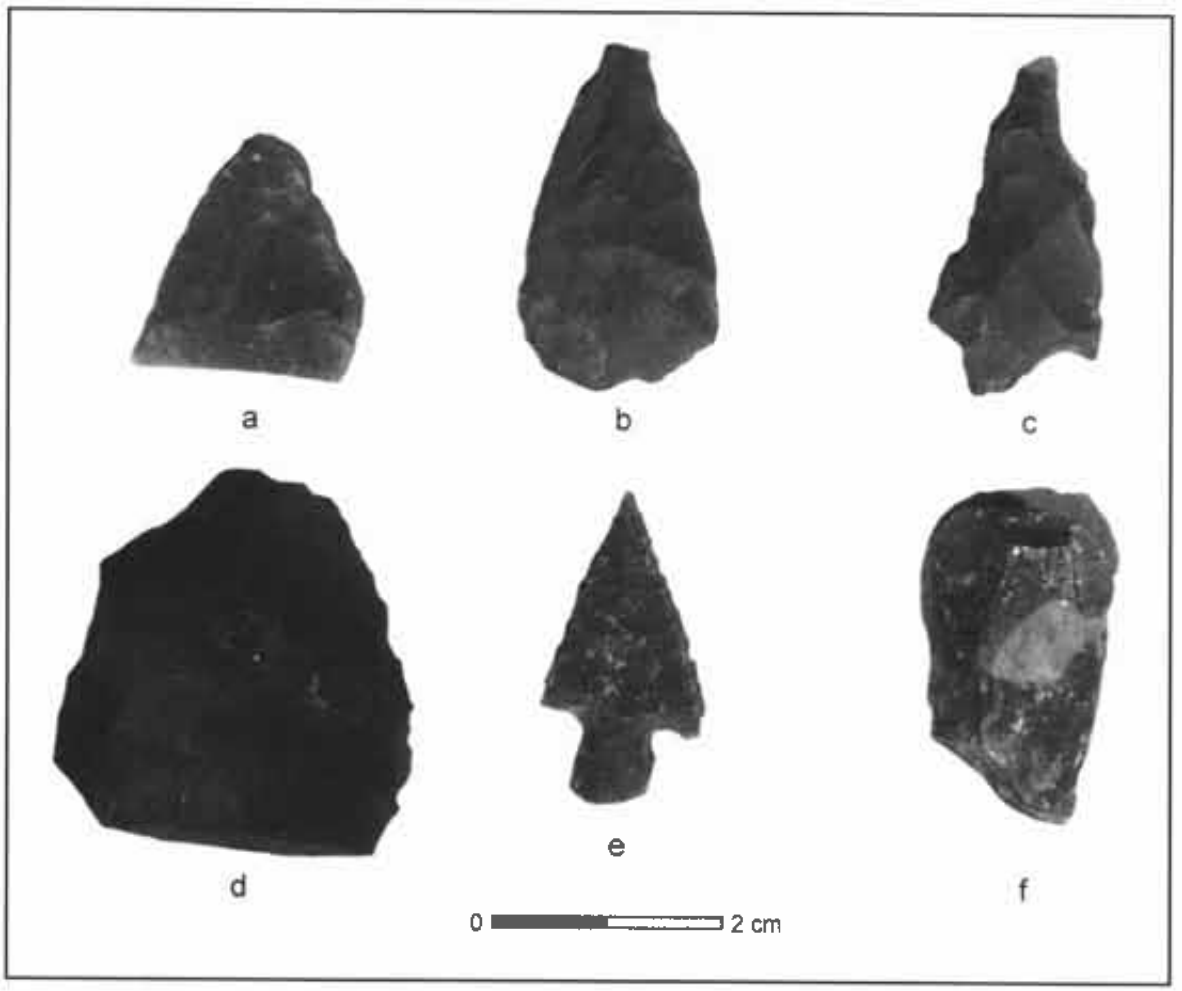

Figure 3. Tiger chert chipped stone tools.

probably introduced through natural processes, this suggests that larger mammals were a significant aspect of subsistence practices during this period.

Bear (*Ursus* sp.) remains have been recovered from several Fremont sites in the region including Dutch John (Loosle and Johnson 2000), McConkie Ranch in Dry Fork (Loosle and Horton 2000) and a ceremonial mask in the Utah Field House Museum (Janetski 2000). Most of these remains appear to have been gathered for personal ornamentation, ceremonial or religious purposes. The bear claw found at this site fits this same pattern. It is not clear from any of the contexts whether bears were actively hunted or scavenged for particular parts. Other pieces of bone were crafted into tools or ornamental items and are discussed below.

Bone artifacts

Seven bone ornaments were recovered and collected, representing three styles common to the Fremont culture (Figure 4). Beads were found in various stages of manufacture, suggesting the production of ornaments at the site. Three finished thin, flat disk beads manufactured from mammal long bones were ground and polished on all surfaces. A square disk bead pre-form was also collected in which the hole had been drilled, and incised grooves are visible where preforms had been snapped off on either side of the piece.

A bead blank made from a segment of bird long bone was also found with grooves on one end where beads would have been removed from cross-sections of the bone. Two finished bone pendants

Table 2. Summary of Site Faunal Remains

Species	NISP	%	Remarks
Unknown	5	3.6	
Order Anura (frogs/toads)	2	1.4	
Order Squamata (lizards/snakes)	2	1.4	clearly not viperids
Class Aves (birds)	3	2.2	
Family Phasianidae (grouse, quail, allies)	3	2.2	
Bonasa sp. (grouse)	2	1.4	
Bubo sp. (Great Horned Owl)	1	0.7	large bone, one rodent bone came from owl pellet
Class Mammalia	5	3.6	Includes 1 micro, 3 small, 1 medium sized
Sylvilagus sp. (jackrabbits/cottontails)	18	13.0	
Sylvilagus audobonii (Desert Cottontail)	9	6.5	all came from one specimen bag
Order Rodentia (rodents)	12	8.7	most probably deposited by raptors
Family Sciuridae (squirrels)	9	6.5	most are ground squirrels (Spermophilus sp.)
Eutamias sp. (chipmunks)	1	0.7	
Marmota flaviventris (Yellow-bellied Marmot)	4	2.9	
Spermophilus sp. (ground squirrels)	11	8.0	size suggests S. tridecemlineatus or S. lateralis
Cynomys leucrus (White-tailed Prairie Dog)	5	3.6	
Ammosphermophilus leucrus (White-tailed Antelope Squirrel)	1	0.7	
Thomomys talipoides (Northern Pocket Gopher)	2	1.4	
Onychomys sp. (Grasshopper Mice)	1	0.7	
Neotoma sp. (Wood rats)	2	1.4	
Neotoma cinera (Bushy-tailed Wood Rat)	9	6.5	
Microtus sp. (voles)	3	2.2	
Ursus sp. (bear)	1	0.7	claw
Order Artiodactyla (medium size)	19	13.8	2 specimens contained cut marks
Odocoileus sp. (deer)	2	1.4	probably O. hemionus (mule deer)
Ovis canadensis (big horn sheep)	6	4.3	
Total	138	100.0	

were also discovered, each a slightly different type. The smaller pendant, measuring 2.65 cm long, had a trapezoidal outline and was made from a section of mammal long bone. Decorative incising is clearly visible in the form of hatch marks along the sides and bottom edge of one side of the pendant. The second pendant measures 8.83 cm long (though the very top of the ornament is broken off) and is made from a portion of the skull of a medium to large sized mammal, most likely deer (Shane Baker, personal communication, 1997).

Finally, a bone awl or needle represents the only utilitarian bone artifact recovered. It measure 5.73 cm long and was made from a segment of mammal long bone that had been split longitudinally and ground along one edge into a point. The lower half of the tool shows polish, probably from use.

In addition to bone remains, a small piece of worked hide was collected in the disturbed fill of Pit 8.

Botanical Remains

Domesticates. The most abundant material collected at the Johnson Rockshelter was corn cobs. Well over 100 cobs were recovered, though preservation of the cobs was generally poor. None of the cobs retained their kernels, although a few loose kernels were recovered. Corn in the Fremont culture area differs from other varieties in its high degree of denting in the kernels. Such denting is particularly pronounced in corn found at sites

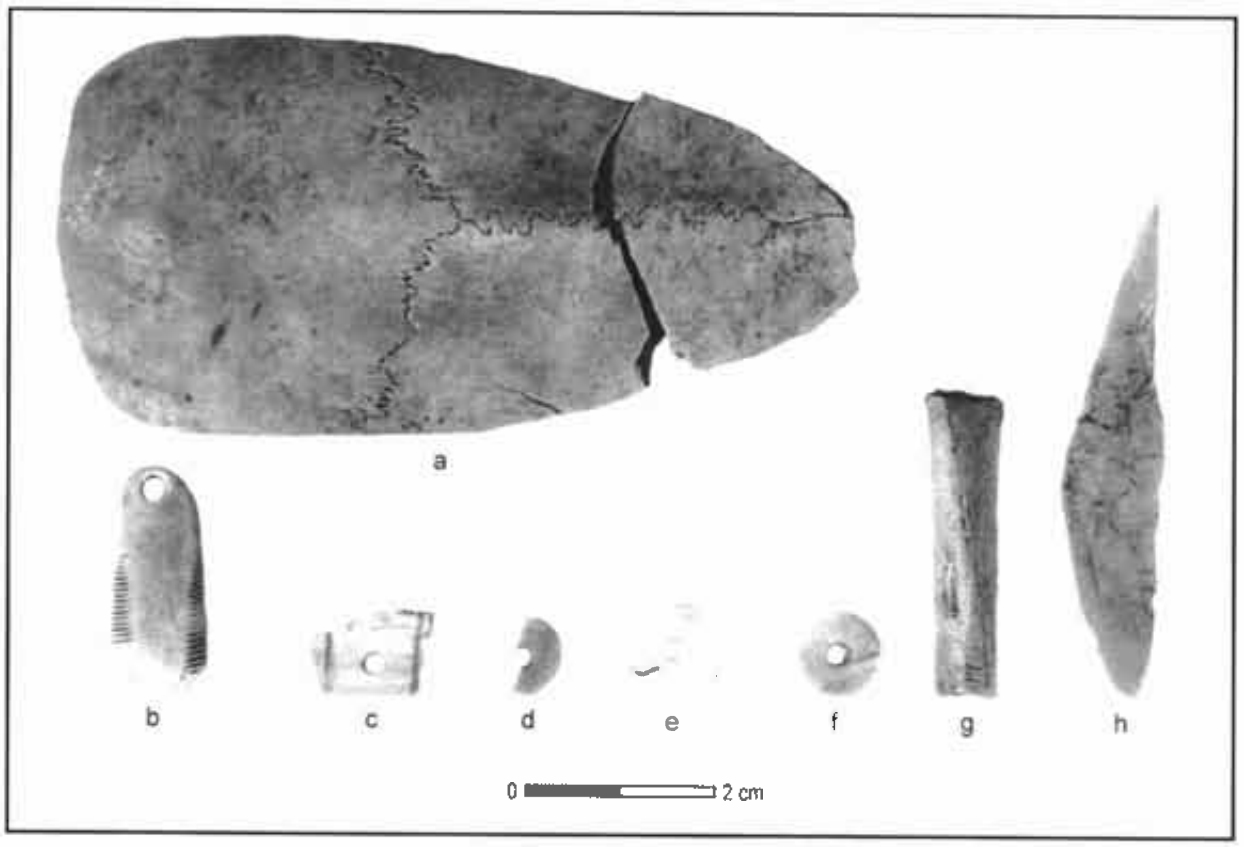

Figure 4. Bone artifacts recovered from the site.

within the Uinta Basin, resulting in "beaking," or pointed/hooked kernel tips. This variety of corn, known as Fremont Dent, is also characterized by large, tapering cobs and row counts ranging around 14 (Winter 1973:444). Winter (1973:445) notes that based on a comparison of corn from eleven Fremont sites, those from sites in southern Utah had consistently higher frequencies of eight-rowed corn as compared with collections from sites in central and northern Utah.

Unfortunately, there was a not a large enough sample from the Johnson Rockshelter to effectively quantify beaked and dented kernels, though the handful of kernels that were noted did exhibit characteristic denting. The vast majority of cobs came from disturbed pit fill. Aside from the absence of kernels, however, the cobs collected from the Johnson Rockshelter fit comfortably within the attributes associated with Fremont Dent variety, as seen in Table 3. Length measurements were taken only on the 40 cobs that had discernable top and stem ends. In addition, about 30 percent of the cobs exhibit some level of charring.

Several rind fragments of pumpkin or squash (cucurbita sp.) and two partial bean (Phaseolus vulgaris) seeds were also recovered from the fill.

Botanical artifacts

A small fragment of basketry and a piece of a snare were recovered from Pit 8. A cedar bark ring in remarkably good condition was collected from the north side of Pit 8. The fragrant oil of cedar is a well-known pest repellent, so it is not surprising that cedar bark rings have been found in a variety of Fremont storage locations (Merkley and Johnson 2002:230, DeVed and DeVed 1994, 1995).

Table 3. Summary of Recovered Corn Cobs

No. of Rows	No. of Cobs	% of Total	Shape of Cob	No. of Cobs	% of Total
8	15	12.6%	Tapered	29	76.3%
10	24	20.2%	Cigar	9	23.7%
12	55	46.2%	–	–	–
14	16	13.4%	–	–	–
16	9	7.6%	–	–	–
Total Cobs	119	–	–	–	–
Avg. No. of Rows	11.7	–	–	–	–
Avg. Length	8.1 cm	–	–	–	–

Clay Artifacts

A very small number of clay objects were recovered at the site, and no ceramic vessels or sherds were found. The base of one small, unfired clay figurine was found in the lower, undisturbed fill of Pit 5 (Figure 5). The fragment measures 3.73 cm long, 2.05 cm wide, and less than 0.72 cm thick. It has a trapezoidal outline and except for possible feet knobs lacks human features. The backside of the figurine has a deep basketry imprint, a common trait of Fremont figurines. Analogs to this figurine fragment can be drawn from some of the more elaborate Fremont figurines found elsewhere in Utah, which exhibit bodies with well-modeled facial and anatomical features. Headdresses, necklaces, pendants, shoulder ornaments, and skirts are artfully formed from carefully appliqued pellets on figurines, which in the case of the Pillings Collection from Range Creek, Utah, can measure 12-15 cm in length (Jennings 1978: 187, 200–205). In particular, it echoes traits of the central figure in the Old Woman Site figurines pictured in Jennings (1978:200, Figure 190).

Another basal figurine fragment found in Pit 8 is very atypical for the Fremont. This figurine more closely resembles an unfired adobe brick than traditional figurines. A single remaining foot knob is the only anatomical feature on the otherwise straight-sided block (Figure 6). The lower third of the figure has been painted with black paint on the front surface. A middle band appears to be unpainted, while traces of red paint are visible at the break and may have covered the upper portion of the figurine. It measures 6.5 cm wide at the shoulder and thickness ranges from 2.3 cm at the center to 3.5 cm at the foot knob. Incomplete length is 10.4 cm.

Other clay materials included a roughly round, unfired clay ball measuring about 2 cm in diameter. It is difficult to assign any cultural significance to this particular item, though very smooth, spherical stone balls of varying sizes have been found at a number of Fremont sites. The connection is dubious but worth noting. Additionally, numerous large jacal or clay fragments were encountered during the course of excavation, many of which had imprints of branches or logs, suggesting they were once part of a superstructure. More about this jacal will be discussed in the next section.

Storage Pits

The storage pits are the central features of the site and were the focus of excavations (see Figure 2). All of the pits were dug into the sandstone floor of the rock shelter to depths often exceeding a meter. The entire interior of the rockshelter appears to have been converted into storage space. The upper portions of the pits, as well as the entire surrounding floor of the rockshelter, had prepared clay surfaces. This, along with the volume of the pits, suggests substantial energy investment in the construction of these storage features. Only Pit 7 and a portion of Pit 5 appear to have been undisturbed from previous excavations. It appears the interior of the rockshelter had been remodeled at least once during prehistory. Subsequent activity at

Figure 5. Base of small figurine. Note basketry impression.

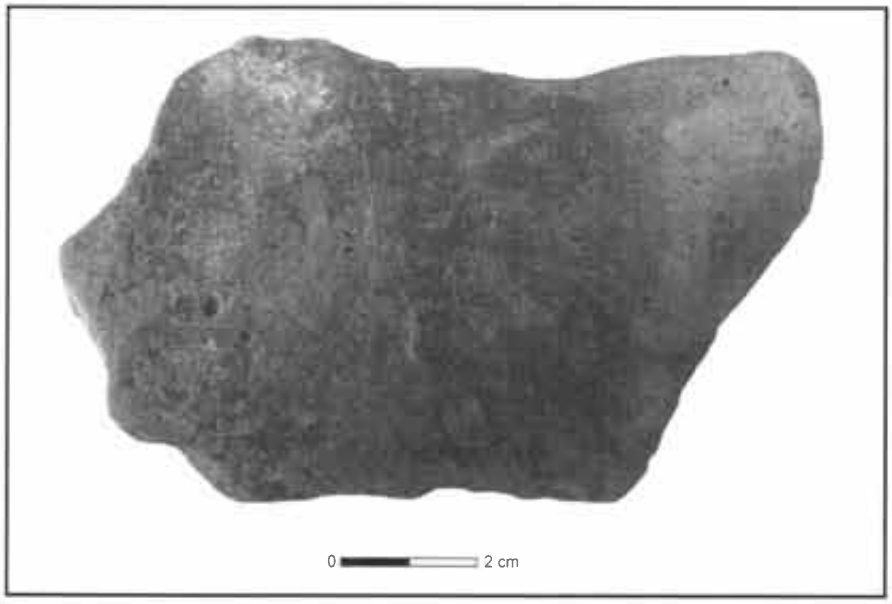

Figure 6. Front of unusual clay figurine. Note black paint on foot knob.

the site has damaged several of the pits. The north end of Pit 5 has been destroyed, but it was not clear if it was from prehistoric or historic activity. The upper portion of Pit 8 had been widened, probably during historic excavations and it continued to deteriorate during our excavation. A large amount of jacal was noted during the excavation, including quantities found in the undisturbed areas of the site. Patches of jacal were also noted on the rockshelter walls. In spite of the amount of clay with branch impressions, no branches or pieces of wood from these jacal structures were ever found. It appears that the rockshelter once contained a large number of small surface wattle and daub features. At some point these were all destroyed and probably scavenged for their wood and then the large subterranean storage features were constructed.

The attributes of each storage pit are summarized in Table 4. Because pit walls were irregular, measurements and volumes should be considered estimates. Although pits are characterized as bell-shaped or slab, they were very asymmetrical and often a combination of both styles. Figure 7 is a profile of Pit 1 that is a classic bell-shaped pit outline. Heavy sandstone slabs were sometimes used to create the downslope wall

of a pit as seen in Pit 3 (Figure 8). Small tunnels connected several of the pits, a practice noted at the Hayes site in Red Canyon (Loosle 2002). Some of the tunnels were dug through bedrock, while several others were lined with clay.

Discussion

A number of factors complicate the interpretation of the Johnson Rockshelter within the context of Fremont storage strategies. Among them, the degree of agricultural commitment among the Uinta Fremont remains a matter of vigorous debate. Marwitt (1970) and more recently Yoder (2005) have argued that a commitment to a farming economy and full-scale sedentism should be reflected in the efforts expended in constructing above ground storage features. In Marwitt's (1970) seminal classification of Fremont cultural variation in which he proposes five regional manifestations of Fremont (Uinta, Parowan, Sevier, Great Salt Lake, and San Rafael), he notes the dearth of surface storage structures in the Uinta Basin. This leads him to suggest, with little other substantiation, that the Fremont in the Uinta Basin were less committed to agriculture than elsewhere in the culture area. Similarly, Yoder (2005) posited that Uinta Basin storage facilities indicate a high degree of mobility. The majority of his data, however, is from the periphery of the Uinta Basin (Red Canyon and northwestern Colorado), where, on the margins of agricultural areas, we might expect to find a higher degree of mobility (Knoll and Loosle 2006).

Closer attention to Uinta storage features provides evidence for a stronger Fremont investment in agriculture than has been previously considered. Deep bell-shaped pits found at sites such as the Johnson Rockshelter required substantial effort to dig into the sandstone bedrock without the use of metal tools. Talbot and Richens (1996:16) mention in their discussion of similar storage pits found at the Steinaker Gap site that given the 1–2m depth and small openings of the pits, the original excavators would have had to dig around their feet and pass loads of dirt over their heads and out of the pits. In such cases, storage was clearly not an idle pursuit. The energy expenditures of digging a series of deep pits into bedrock and preparing the surface suggest a commitment to agricultural storage. Ethnographically, these underground storage pits were often sealed and left for extended periods of time.

The use of bell-shaped storage pits in Utah dates back to the spread of domesticated crops around A.D. 1. Late Archaic or early transitional Fremont sites such as Steinaker Gap (Talbot and Richens 1996) just east of the Johnson Rockshelter, the Elsinore Burial site (Wilde and Newman 1989) in south-central Utah, the Confluence site (Greubel 1998) in central Utah, and at sites at Sandy Ridge near Moab (Richens and Talbot 1989) date to between A.D. 1–500. Though the presence of corn and other food materials leads to the conclusion that the primary function of the pits was storage, larger pits were occasionally used for interment as well. Storage pits in a variety of shapes are found at Basketmaker II sites in the Southwest that date to the same time period, and also express food storage and interment activities (Wills 1988). However, no human remains were recovered in the bell-shaped pits at the Johnson Rockshelter. Yoder (2005:26) argues that during the period from A.D. 550 to 950 there was a steady rise in the number of storage features across the Fremont area with a mix of underground and above ground features, suggesting the Fremont became more sedentary after A.D. 950. If this pattern was followed in the Uinta Basin, perhaps during the late Fremont period the rockshelter no longer functioned strictly as a storage site, but was occupied by more sedentary farmers performing other activities in the cool recess. The single radiocarbon date obtained from the Johnson Rockshelter comes from near the end of Yoder's middle period and fits the pattern he notes across the state, though additional direct dating of materials and features is needed to address this scenario.

As Wills (1988:38) observes, the adoption of domesticated resources is not without its

Table 4. Storage Pit Attributes

Pit	Shape	Opening (cm)	Max width (cm)	Depth (cm)	Lining	Connecting Tunnels	Volume (m^3)	Condition	Contents
1	bell	75	145	105	clay/bedrock		0.8	disturbed	squash rind, bone, debitage, corn cobs
2a	basin	50x103	108	46	clay/bedrock	to 7 and 2b	0.24		modern debris all levels, jacal fragments, juniper bark, charcoal
2b	irregular	200x90	200	70	cultural fill/ bedrock	to 2a	1.3	disturbed	juniper bark, corn cobs, modern trash
3	vault	110x220	220	100	slabs/clay/ bedrock		2.4	disturbed	jacal fragments, juniper bark, corn cobs, debitage, squash seed
4	vault	120x90	120	missing	clay/bedrock		0.9		debitage, a disk bead, corn cobs, faunal bone, jacal
5	bell	150	220	110	clay/slabs	to 7	1.2	partially disturbed	stone tools, figurine, handstone, beads, awl, pendant, most of debitage, jacal, corn cobs, squash rind and seeds, juniper bark, faunal bone, charcoal, modern trash
6	basin	15	15	12	bedrock		negligible	disturbed	jacal, charcoal, corn cobs, corn husks, squash seeds, debitage, juniper bark, coprolites
7	vault	80	120	95	slab/bedrock	several, some sealed	0.9	largely undisturbed	corn cobs, jacal, charcoal, debitage, faunal bone, groundstone, pictographs, two smaller interior pits
8	bell	90	190x220	110	clay/bedrock		1.5	disturbed	corn cobs (many burned), debitage, beads, flake tool, cedar bark ring

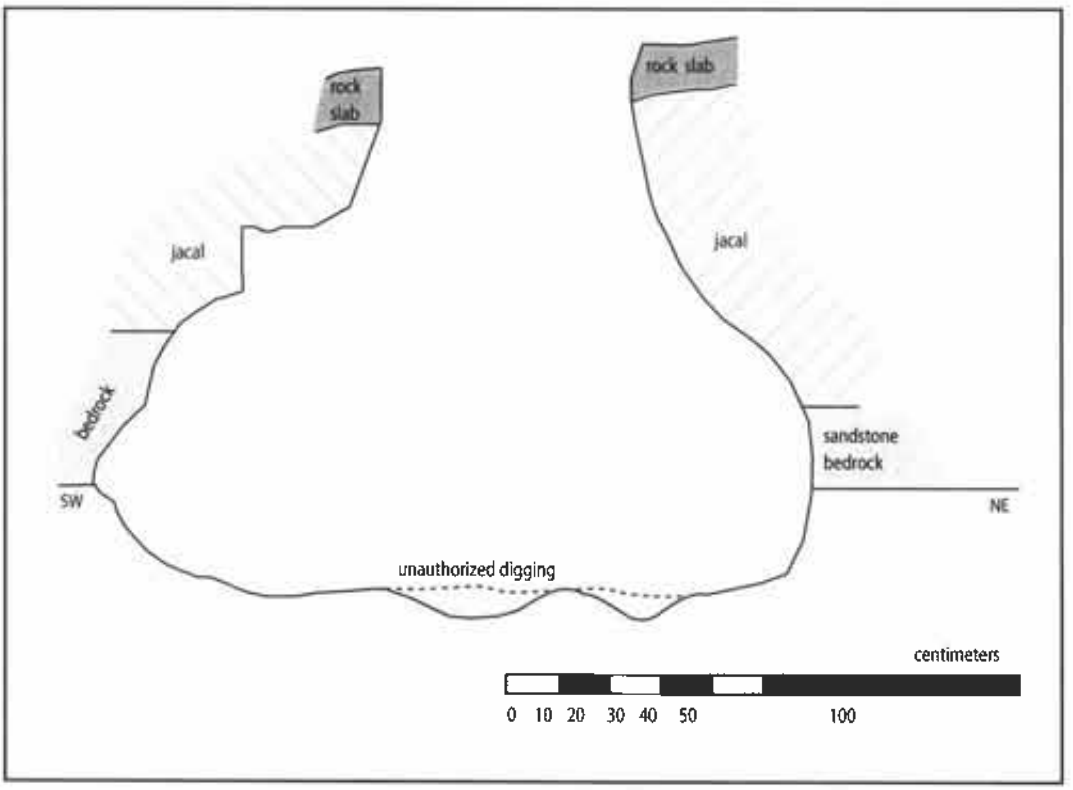

Figure 7. Profile of Pit 1.

risks, which demand "several minimum strategic commitments." In addition to managing seasonal workload associated with horticulture, maintaining the harvested crop is also of prime concern. However, as Wills (1988:38–39) notes:

> The storage of domesticates is not as simple as caching the seeds. In the evolution of annual domesticated plants, humans have selected species that tend to germinate when planted, or in other words, that do not remain dormant for unpredictable lengths of time...(Harlan et al. 1973:319).
>
> Increasing the predictability of germination at planting has obvious advantages, but at least one disadvantage. Increased susceptibility to moisture and temperature allows seeds to germinate while in storage if those variables are not adequately controlled. Smith (1985:60) suggests that this increased need for seed maintenance may have been a factor in the construction of subsurface storage pits in the prehistoric midwestern United States.
>
> Storage of corn in above ground facilities is well known, especially in the Southwest, but maintaining cool arid dry conditions seems to be a common goal in all regions in where corn is grown. Where below ground storage of corn is documented, it apparently covaries with a need to hide stored resources or with periodic abandonment of the storage location...where mobility is important, subsurface storage may be required because of an inability to monitor the stored resources.

Thus there are at least two primary concerns addressed by subsurface storage—preventing the crop from germinating prematurely and protection from invaders during periods of mobility.

The human ecology described by Talbot and Richens (1996), and informed theoretically by Wills (1988), to understand storage behavior at the Late Archaic/Early Formative site near Steinaker Reservoir may also apply to the interpretations of foraging and horticultural strategies in the Uinta Basin later in the Formative period. Relying on

Figure 8. Overview of Pit 3. Note large slabs on downhill side of the pit.

ethnographic information on Great Plains semi-sedentary horticulturalists, Talbot and Richens compare strategies apparent in the Uinta Basin to the Hidatsa, Pawnee, and Mandan. These groups all lived in circular, semi-subterranean houses and constructed bell-shaped storage pits to store maize, squash, and other foods. These groups were sedentary farmers during the spring, summer, and fall and were mobile bison hunters during the winter. Cultigens were carefully stored in the fall to provide food resources and seed stock for the groups when they returned to their villages in the spring (Forde 1963; Wilson 1917). Yoder (2005) uses Young's (1996) model to reach a similar conclusion and proposes the same general model for the Fremont. Ethnographically, people use off site subterranean storage to help conceal and protect their food stuffs because they are seasonally absent. This is critical because spring is considered the poorest season: winter stores are depleted, animals are in their poorest condition, and wild plants have not yet begun to produce seeds or other edible parts.

Hidatsa, Mandan, and Pawnee storage practices involved the construction of large, bell-shaped pits often to depths of 2m. Pits were located alternately within habitations, within villages, and outside villages in deep, well-drained sediments. Hidatsa pits were made and filled by women who lined the cavity with dried grass. Corn and other foodstuffs were then packed in and covered with another layer of grass, a circle of hide, small logs, and earth and ash. The positions of the pits were concealed as much as possible to guard against plundering of the villages while they were unoccupied during the hunting season. The greater part of the stored food was then consumed in March after the Hidatsa had returned from winter hunts (Forde 1963:256-257). Pits were used for storage until moisture and deterioration spoiled them, at which point the people filled them with refuse and/or used them for human interment.

> The pattern that emerges is a picture of groups whose settlement and subsistence systems revolved around sedentary corn agriculture for three seasons out of the year, but who then shifted to a mobile hunting strategy during the winter. At least a portion of the harvested crops were kept protected during the winter months in deep storage pits, possibly at times watched over by older or otherwise incapacitated group members who were left behind (Talbot and Richens 1996:229).

The hypothesis of Fremont seasonal mobility is consistent with data from intensively investigated foraging sites in the Browns Park area, including 42DA393 (McKibbin 1992) and 42DA485 (McKibbin and Rood 1992). These sites were interpreted as late winter or early spring foraging sites as evidenced by faunal remains, which included bones of immature and fetal animals, and highly fragmented large mammal remains indicative of bone grease processing and marrow extraction. Material culture traits

typically considered characteristic of the Fremont culture (maize and Uinta grayware ceramics) were also recovered, which, within a foraging context, could be evidence of late fall/winter migrations by Fremont farmers into upper Green River drainages to exploit winter ranges of game animals. These foragers could have brought with them processed maize as a supplemental food resource. Ceramics could have been manufactured at the winter base camps, though given the seasonal demands of ceramic production it is more likely that pots were carried in small quantities to the camps as needed from farmsteads or villages in the Uinta Basin (Spangler 1995:498).

The range of activities reflected in the artifact assemblage from the Johnson Rockshelter is another dimension of the site that warrants explanation. The presence of maize, squash, and storage and grinding features are consistent with behaviors predicted to occur at a storage site and traditionally associated with women's activities. Clearly, however, maize grinding was not the only activity occurring at the site. Bead production and lithic reduction are two other activities conspicuously represented in the assemblage. Binford's (1978) ethnoarchaeological research among Nunamiut Eskimo hunters showed how behavioral dimensions such as activity structure, technological organization, modes of trash disposal, and spatial organization impact the formation of the archaeological record. The rockshelter surely fits into Binford's definition of a special-purpose site, however, intrasite functional variability is suggested by the variety of artifacts present. Given the view of the Ashley drainage afforded by the elevated location of the rockshelter, the Johnson Rockshelter may also have been useful as a hunting stand not unlike the Mask Site, in which Nunamiut hunters, to pass the time, exhibited a range of behaviors not specifically related to hunting (Binford 1978). Similarly, materials recovered at the Johnson Rockshelter may be the result of tool maintenance activities (i.e. lithic reduction) or production (i.e. bead making) by hunters taking advantage of the site's viewshed. However, too little is known specifically about the gendered activities of the Fremont to rule out that bead making, lithic reduction or other activities were not simply engaged in by women during the course of food processing at the site. Another possibility is that the repeated excavations at the site have mixed the materials from earlier or subsequent occupations.

Detailed interpretations of local storage practices are hampered by the fact that few of the large Fremont sites in the interior of the Uinta Basin have been systematically excavated or dated. Although the Johnson Rockshelter would be an outstanding location for habitation, no hearth features or evidence of residential features were uncovered. It is possible, even probable, that further surveys will reveal the presence of a village within close proximity to the storage site, which would lend invaluable social and economic context to the behaviors documented at the site. Indeed, private landowners have suggested the presence of possible domestic structures across Ashley Creek, though they have yet to be confirmed through archaeological reconnaissance.

Conclusion

Limited attention has been given specifically to storage practices of the Fremont, but it is clear from ethnographic evidence and from archaeological sites such as the Johnson Rockshelter that storage behaviors have much to offer in elucidating the logistical decisions faced by horticulturalists. Such issues will ultimately broaden the nature of Fremont research beyond ethnogenesis by addressing the means by which people interacted with a climatically and geographically diverse landscape.

Storage features reflecting early farming activities in the Uinta Basin date back around A.D. 1. Since that time, pits, and in some cases surface structures, have most commonly been found either in direct association with settlement sites (e.g., Caldwell Village), or in remote locations away from population aggregates and out of plain sight (e.g., Mantle's Cave). The Johnson Rockshelter

represents an interesting variation on Uinta Basin Fremont storage strategies known from sites elsewhere in the Uinta Basin. The relatively wide variety of remains, including lithic debris, bead blanks, clay figurines, and grinding slicks suggests that the rockshelter was the locus of a range of domestic and/or craft production activities during part of its history.

However, it is difficult to ascertain the context of these activities until a thorough evaluation of the archaeological resources in the immediate vicinity of the Ashley Creek drainage has been conducted. Specifically, the domestic activities suggested by artifacts and features at the site, the lack of visible hearths (despite the presence of charcoal), and the close proximity to arable land and expansive rock art panels all suggest that a habitation site was present in the vicinity. The ca. A.D. 880 timeframe of occupation and extensive off-site subterranean storage seems to support Yoder's (2005) hypothesis that between A.D. 550 and 950 the Fremont were semi-sedentary, perhaps seasonally abandoning their residences after the maize harvest for hunting or other procurement trips. Located as it is on private land, the Johnson Rockshelter, and the Ashley Creek drainage system in general, represent not only laboratories with high potential for developing and exploring theories of Fremont settlement and subsistence habits, but also the hope of strengthening the relationships of trust between archaeologists and private landholders.

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Archaeological Outreach with Kids along the Wasatch Front

Phoebe Eskenazi and Ronald J. Rood

Because the science of archaeology draws upon so many different disciplines, it is a perfect mechanism to teach young people about all aspects of science, math, the arts and character. Doing archaeological field and laboratory work with 4th – 6th grade elementary students not only exposes them to archaeology but it can also enlighten them to a whole range of ideas and endeavors using archaeology as a backdrop. Exposing kids to anthropology and archaeology ensures future stewards for the resource and at the same time, serves to excite their minds about science and the arts. Working with kids on an archaeological site is not easy and it is not for everyone but we believe it is a focal point for public outreach efforts.

The Antiquities Section has long had a positive association with young people through outreach and educational efforts. ZiNj Magazine, Utah Prehistory Week, School Presentations, Career Days, along with ongoing efforts to bring kids into the field for hands-on experiences are just some of the ways we, as a State Agency, provide ownership and foster stewardship for Utah's archaeological resources.

At the same time, professional archaeology is doing a better job of connecting with the public. The public that funds archaeological research is indeed interested in archaeological research. In a recent study conducted by the Society for American Archaeology (SAA), 73% of respondents who identified themselves as having a low interest in archaeology felt that K-12 students should learn about the work done by archaeologists and archaeology in their school curriculum (Ramos and Duganne 2000). In the same study, nearly 10% of respondents reported archaeology as being an important aspect of today's society. In a 1999 study conducted in British Columbia, Pokotylo and Guppy (1999:401) found the general public to be "highly interested in archaeology and concerned about protecting archaeological sites."

In addition, a number of archaeologists have in recent years begun to think about the science of archaeology and how it can be used as a teaching tool for elementary, middle, and high school students in a wide array of subject matters. In "The Archaeologist as Global Educator," Messenger and Enloe see archaeology and education as natural partners. Archaeologists want to promote public awareness and support for their work, and educators want students to become "creators, explorers, discoverers, interpreters, and meaning-makers" (Messenger and Enloe 1991). Specifically, the hallmark publication *Intrigue of the Past* (Smith et al. 1997) provides well constructed lesson plans for 4th and 7th grade teachers to introduce archaeology while teaching reading, math, science, critical thinking, etc. Other work, namely discussions by Few et al. (1995), Selig (1991), Smith and McManamon (1991), Smith et al. (1997), Jameson (1997), and Smardz and Smith (2000) offer specific ways to teach kids and the general public about archaeology.

A survey conducted in Southeastern Utah concerning public opinions and notions about archaeology shows the need for improving public perception and education, as only 35% of

respondents reported archaeology is relevant and important (Younker-Koeppel 2006). We suspect there is broader public support for archaeology in Utah as there seems to been continued support for state laws that protect archaeological sites and in support of legislative action to strengthen protection of archaeological sites on state lands and in the case of human remains, private lands.

Public Outreach in Archaeology and the Antiquities Section

For many years, interested members of the public have had opportunities to work with Antiquities Section archaeologists on field and lab projects. The Utah Statewide Archaeological Society (USAS) had its beginnings in the early 1960s and continues to this day to be an integral part of the Antiquities Section efforts.

The Focus on Kids – The Mushroom Springs Site

During the spring of 1999, the Utah State History and the Antiquities Section was presented with a very unique opportunity to grow and enrich public outreach in archaeology. During the construction of a spring development to bring water to the historic Fielding – Garr Ranch on Antelope Island, an archaeological monitor for Utah State Parks discovered a buried archaeological site that became known as 42Dv79, or the Mushroom Springs Site. The site was extensive, and although a significant portion of the site was unfortunately destroyed, substantial intact deposits remained. Utah State Parks asked the Antiquities Section for assistance and we helped with some of the initial testing of the site using USAS volunteers and several 4th grade students who had been volunteering in the archaeology laboratory. After the archaeological testing, supervised by Utah State Parks archaeologist William Latady, Utah State Parks evaluated the site as significant and eligible for nomination to the National Register of Historic Places under criterion D (Latady 2000).

Utah State Parks and the Antiquities Section formed a partnership to accomplish several goals:

1. Mitigate the adverse effects to the Mushroom Springs Site through archaeological investigation.
2. Prepare a research design to guide the archaeological work.
3. Use this site and the excavations as a field laboratory for public outreach, research, and education for the public at large; especially for elementary age students.
4. Run the project so that there was NO COST to the student participants.

The Mushroom Springs Archaeological Field School was initiated in 2000, with supervision by the Antiquities Section and Utah State Parks. Participants included individuals from USAS, the general public, and several 4th and 5th grade students from various schools in the Salt Lake City area. The field work was short, involving one week of subsurface testing and mapping. Field work during 2001 was also short, with student volunteers spending only a few days working in the main excavation area. In 2002, however, the field school partnered with Neuman Elementary School in Salt Lake City and partnerships were expanded to include the Colby School in Park City, and Our Lady of Lourdes School in Salt Lake. We were able to work closely with Danielle Patterson, one of the original authors of *Intrigue of the Past* (Smith et al. 1997) to assist with the project and we initiated several new components to the field school including a stronger writing component. We had students keep journals in which they wrote about their daily experiences on the site. We also had the students write research questions, questions they wanted answered about the site. For example, one student wrote a research question about why the bone was broken into such small pieces while another wrote a question about the lack of any artifacts in the grid he was working in.

After two seasons off, we ran an expanded field school for kids in 2006. In a unique partnership with Escalante Elementary School in Salt Lake City, we ran a three-week program that included both field and laboratory work. Students from

Escalante were invited to enter an essay contest to determine which students could attend the summer program. Three one-week sessions in the field were set up and a total of 28 4th and 5th grade students participated. The program included:

1. Writing research questions about the site.
2. Daily journals and writing assignments.
3. Wide ranging tasks in the field (photography, mapping, notes, giving tours)
4. Expanded lessons in geology, zoology, and wetlands ecology.

The writing example shown below demonstrates how this student was able to take the archaeological data (fire-cracked rock, broken pottery, broken animal bone, stone tools) and turn those artifacts into a story about daily life for a child living 1000 years ago:

> Is it morning already? Another day of hauling rock for the fires. Oh well, we'll have lots of bone grease for winter food. I hope the hunters get more antelope today. Making bone grease is hard work but I like helping my mom crack the bones and put them into the pot. My brother likes taking the hot rocks from the fire and putting them in the pot. The hissing noise is funny and the water really boils up. My brother is learning how to make arrowheads but he's not very good. He keeps breaking them. He gets mad and it is funny. I like coming to the island even though it is hard work hauling rocks and making bone grease. Soon we'll cross the lakes in our little boats and go back to the big village by the river for the winter [*A. Rogers, age 12*]

In 2007, with a continuing partnership with Escalante Elementary and with many return students from 2006, the field school was moved to the Prison Site (Yentsch et al. 2008) near Draper, Utah for three weeks. Unfortunately some of the field work was cut short, but the students under the direction of volunteer educator Phoebe Eskenazi (Sacred Spaces Consulting) worked in the laboratory and pursued several different avenues of research (Eskenazi and Rood 2007).

For example, the Prison Site is archaic in age and dates to a time when people in Utah were hunters and gatherers. To gain some insight into hunter-gatherer life ways, the students interviewed Dr. Kevin Jones about his work with modern hunters and gatherers in South America. The students also created a mural about their work on the site and in the laboratory.

Building upon the work of Ms. Patterson, we designed our curriculum to fit into the Utah State Standards (Figure 1).

Running an Archaeological Field School For Kids

As strong advocates for more public participation in archaeology, we would recommend including young people in your own archaeological education programs. That being said, working with children does require some special skills and may not be for everyone. Further, some archaeological sites or projects may not be appropriate for children. With that in mind, projects using public funds should consider ways to include younger participants in a safe manner to further our educational efforts.

Selecting Students

If you run an ad in the newspaper or through the schools for an archaeological opportunity, be prepared for hundreds of applicants. We would recommend forming a partnership with one school or youth group so your efforts can be focused and to provide some level of control. Organize an essay contest with clearly defined expectations so the students must do a bit of research on their own.

Staffing

When using a real archaeological site for any type of educational outreach, no matter if you are teaching adults, children or college students, you must have an appropriate level of staff help. In our work, we've typically had one professional archaeologist or educator for every 5 student participants. In our situation, we were able to

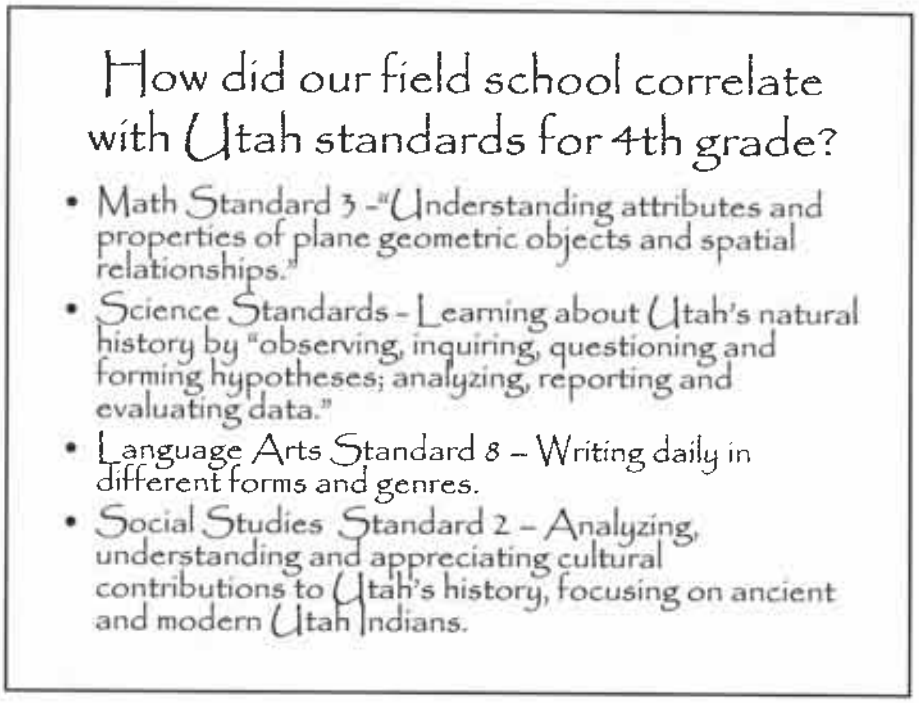

Figure 1. Utah Standards for 4th Grade

tap into volunteers from USAS (Utah Statewide Archaeological Society) and former students to serve as mentors.

The Site

Using a real site is preferable in our opinion. "Mock Digs" generally turn into treasure hunts and students will realize what they are doing is not real. Working on a real site alongside real professional archaeologists fosters an attitude of ownership and contribution. Any site used for a field school must be logistically appropriate for children and safe. Clearly a discovery site along a pipeline during pipeline construction would not be appropriate.

Funding

Our program is funded through the Antiquities Section, and the Mushroom Springs work was partially funded through a cooperative agreement with Utah State Parks. Funding through creative Section 106 compliance or through education grant programs may be available. Federal funds may be available through the "Take it Outdoors" and "Get Outdoors Day" programs through federal agencies.

Curriculum

Just like a research design, having a well thought out curriculum is a must for any archaeological field school. Just having children picking artifacts from the screen and calling it public education is not going to work. The curriculum guides your day and actually will assist you, the archaeologist, in making good decisions on how to best provide the best educational experiences for the students.

In our program, the curriculum has four basic but important attributes. These are:

1. Direct Instruction – The teacher communicates the objectives of the lesson to the students.
2. Modeling behavior – The teacher demonstrates the process(es) involved.
3. Experiential learning – The students practice or engage in the lesson through hands-on involvement.

4. Feedback - The teacher provides response and evaluation to the student.

Overall Curriculum Features

The first morning of the field school was spent in the office going over a few basic concepts, rules, and making sure the students understood our overall goals. An introduction to the archaeology of Utah using slides (PowerPoint) and artifact examples was done in a classroom setting. Artifacts from the site were examined and handled by the students along with some instruction on what types of information those artifacts can tell us about the people that lived at the site. Basic information about the fieldwork process was discussed; for example, what is a site number? How do you fill out the bags? What is an FS number? These concepts are introduced, but the students will learn more about record keeping in the field.

On the afternoon of the first day, we travel to the site. There we again go over the basics, the rules, and the morning's work. We review what the archaeologists think about the site, what we've learned so far, and what we might learn in the future. We ask them to write in their own notebooks three things they want to learn about the site. Fieldwork begins on day 2.

Typical field day (morning):

- Students are transported by van from State History to site at 9:00 a.m.
- Students are briefed on the objectives for the day.
- Specific jobs are assigned: distributing tools, clipboards and pencils, reloading gear, etc.
- Students are paired with excavation partners – a novice excavator works with a returning and/ or more experienced digger.
- Students take turns screening, labeling bags, writing field notes.
- Lunch break at noon; "shade" and water breaks throughout the morning.
- Students return to State History building around 2:00 p.m.

Typical lab (afternoon):

- Students wash, sort, count artifacts.
- Students do data entry in field notebook and on computer.
- Students (with supervision) use the existing collections to expand their understanding of material collected that day.
- Students record and share their experiences and reflections through prose and poetry.
- Students create a mural which documents their field and lab experiences. The mural evolves throughout field school.
- Teachers lead students in semantic mapping (also called "webbing") – a process to develop descriptions, categories, and associations of terms.
- Students take 20 minute break.
- Students are picked up around 4:00 p.m.

Lessons Learned

Schedule plenty of breaks in the day to encourage drinking adequate water, eating nutritious snacks, and having recess time. Build flexibility into every lesson. Be aware of the "teachable" moment. Example: The porta-potty was trashed by vandals, and we discussed how we should treat the situation. Have back-up plans in the event of rainy weather or illness on the part of any of the teaching team. Be prepared to deal with children becoming ill at the site or at the lab. Engage the students…ask for their thoughts regarding the culture they're discovering. Use older students as mentors if possible. In our experience, 4th and 5th grade students responded positively to lessons being taught by 8th and 9th grade mentors. For the archaeologist, partner with a professional educator.

The Future

As an archaeologist and an educator, we see the value in teaching kids about Utah's archaeological past. Not because we want them to become archaeologists, but because we want them to feel ownership. The students we have worked with over the years have become stewards of the past,

Figure 2. Minoka writing notes within the grid units at Mushroom Springs.

Figure 3. Casey filling out the Field Specimen Log at the Mushroom Springs Site.

and hopefully, gained an experience not forgotten in this age of video games, text messaging, and reality television. We do not worry about these students ever vandalizing an archaeological site or illegally collecting artifacts. They have an appreciation because they have ownership. They have been in the field and they know that a tiny piece of bone or a broken pottery sherd is much more than just an object from the past. They know that an artifact is like a page from a book (Figures 2 and 3).

Using an archaeological site as a backdrop for teaching kids about scientific processes, math, and working cooperatively works well because the students are engaged 100% of the time. Children that have an intense interest in archaeology think archaeology is cool and will grow up to be adults that have an investment in archaeology. Along with archaeology, they gain a broader appreciation of science, history, the arts, and the world around them (Figure 4).

We are able to do these projects because of the dedication to public outreach by the Antiquities Section. With limited financial support from partners like Utah State Parks (Mushroom Springs) and by cooperating with other projects that have been funded (The Prison Site) we have been able to run several years of successful public outreach for kids.

Summary

An archaeological field school for children is an experience which is worthwhile on several levels. Educationally, it is both a context and a vehicle for holistic, hands-on learning. At our 2007 field school, science, math, social studies, and language arts connected seamlessly as children examined fire-cracked rock, measured and established grids, handled material culture, and responded to all of these through poetry and prose. Socially, a field school program engenders cooperation while promoting cultural understandings and sensitivities —and by extension— responsible stewardship of land and culture. A good field school experience can help grow informed, engaged and compassionate citizens. The world needs many such individuals, and we are convinced that public archaeology has contributed, and will continue to contribute, to that goal.

Acknowledgements: We would like to thank all of the students who have participated in this program and a special thanks to Abram Sorensen and Nikel Taylor who served as student mentors at Mushroom Springs

Figure 4. One of the Mushroom Springs crews from 2006 including student assistants.

and at the Prison Site. We appreciate the thoughtful comments on an earlier version of this paper by Charmaine Thompson, Byron Loosle and David Yoder. Go dig with kids, you won't regret it!

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The Use of 3-D Laser Scanning in Mapping a Petroglyph Site

Misti Haines and Joelle McCarthy

Rock art sites can be notoriously difficult to record. Recording large sites can consume massive amounts of time, shifting light can make photos and even sketches difficult, and two dimensional maps don't accurately capture the three dimensional spaces. As an experiment to combat these issues, Fillmore Field Office BLM integrated 3-D laser site mapping into a 2006 National Public Land Day rock art recording project. Ensuring that the three dimensional data could be utilized as a meaningful mapping tool involved experimentation with the ArcMap and ArcScene software. Eventually, a successful solution using a hyperlink command to link traditionally recorded panel data to three dimensional locations was reached. However, this process still needs refinement and will likely evolve as more data and better technology becomes available.

Petroglyphs are among the most alluring and provocative traces prehistoric people left on the landscape. The inherent mystery of rock art leaves interpretation as open to the amateur as to the expert and makes the images an invaluable resource in appealing to the public to protect archeology. Unfortunately, interest in rock art sites can leave them vulnerable to damage, making preservation by record essential.

Conventional methods of recording rock art can consume vast amounts of time and produce only partially satisfactory results. Recorders typically attempt to capture site and panel information with plan maps, elevation drawings, photographs, sketches, string-grid drawings, and narrative descriptions on IMACS rock art attachments. These techniques are hampered by human interpretation, ever shifting light, and time constraints. Ultimately, translating three dimensional data into two dimensions can never tell the whole story of a rock art site.

In 2006, Fillmore Field Office (FFO) worked with M2 Technical Services to record surfaces at a rock art site in three dimensions with a laser scanner. Our results were not perfect, but they do suggest exciting possibilities for future rock art recording (Figure 1). As with any new technology, some aspects were successful beyond what we had hoped, while others presented entirely new, and currently insurmountable (by us), challenges.

Devils Kitchen Petroglyph Site

Devils Kitchen Petroglyph Site (42MD85) is located a few miles west of Fillmore, Utah. The site is well known by the public and receives visitation from local Boy Scout troops, ATV groups, and sightseers every year.

Devils Kitchen is a complex site. The rock art is situated on a basalt outcrop that caps a northwest-southeast trending ridge. At the toe of the ridge, petroglyph panels are located on all faces of the boulders. Further up the ridge petroglyphs are oriented vertically on the face of the outcrop. The 127 panels indicate Archaic, Fremont, Paiute, and historic use of the site. Before this project, we had a one page site record from the 1940's, no map, and no photographs of the Devils Kitchen site.

Figure 3. URARA volunteers recording rock art panels at NPLD 2006.

Figure 4. Ken Mears of M2 Technical Services setting up laser scanner.

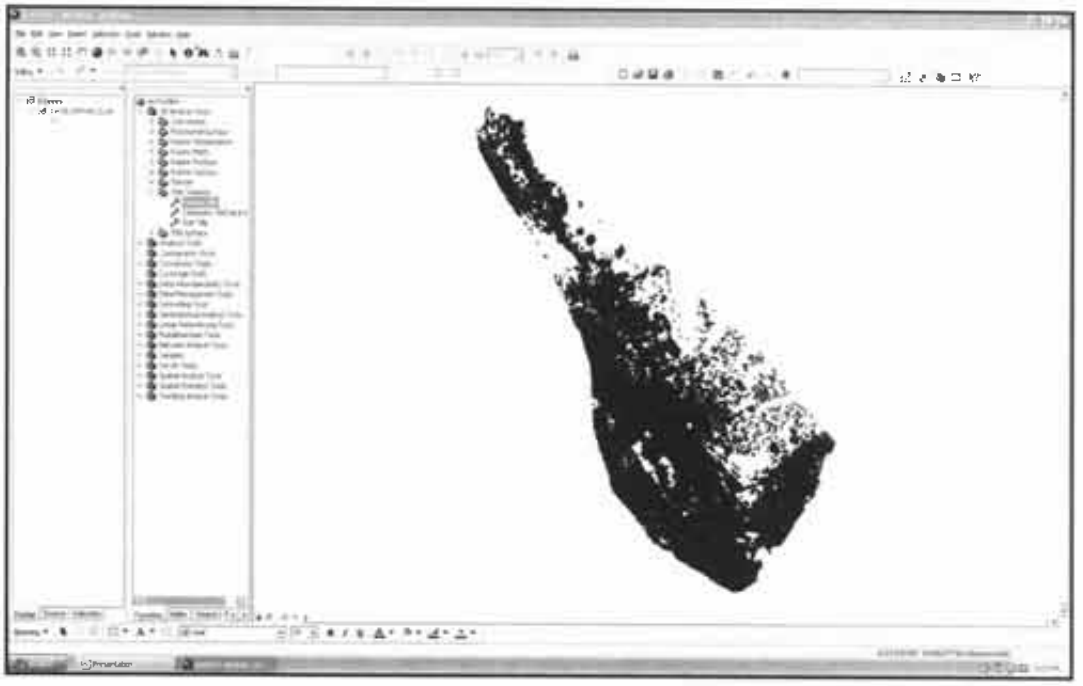

Figure 5. 1,000,000 point 'cloud' displayed in ArcMap GIS.

that displayed the points as a "cloud." The point cloud was geo-referenced based on GPS points taken at the scanner and target locations and then projected. M2 provided us with clean point data in the form of a Digital eXchange Format (.dxf) file. The post-processing process took M2 about two days and would typically cost about $80 an hour.

Translating into the GIS environment

We accessed the .dxf file in ArcGIS by adding it as a layer. The .dxf had 5 features: polygon, polyline, multipatch, annotation, and point. Because the data we were interested in consisted entirely of points, we removed the other features.

In order to convert the .dxf point file into a format that we could manipulate, we exported the data as an ArcMap Shapefile. The new Shapefile contained about 1,000,000 points, each with geo-referenced x, y, and z coordinates (Figure 5). In order to see these points in three dimensions, we brought them into the ArcScene program. We then edited the Shapefile by removing some "outliers" and other points which we anticipated might cause problems in our three-dimensional map.

Creating a 3-D site map

Next, we needed to convert 1,000,000 individual points into one useful shape, called triangular irregular network, or TIN (Figure 6). A TIN is basically a web of triangles drawn between adjacent points to create a contiguous surface, like a three-dimensional version of connect-the-dots.

Creating a TIN in ArcMap involves two steps. First, we made a new empty TIN. Then, we opened it for editing and added the point Shapefile data. The amount of time it takes to populate a TIN with data is determined by the amount of data involved and the speed of the operating system. In this case, populating the TIN took half an hour on our fastest computer (3 GHz, 2 GB RAM) and overnight on our slower ones (1.66 GHz, 2 GB RAM).

Once the TIN was created we brought it into ArcScene and noticed some glitches. On the slower computers, the TIN was unwieldy at best, and would occasionally crash the computer immediately upon opening. The TIN represented some sheer cliff faces as tall geometric "spikes", rather than a rough organic surface. This might be

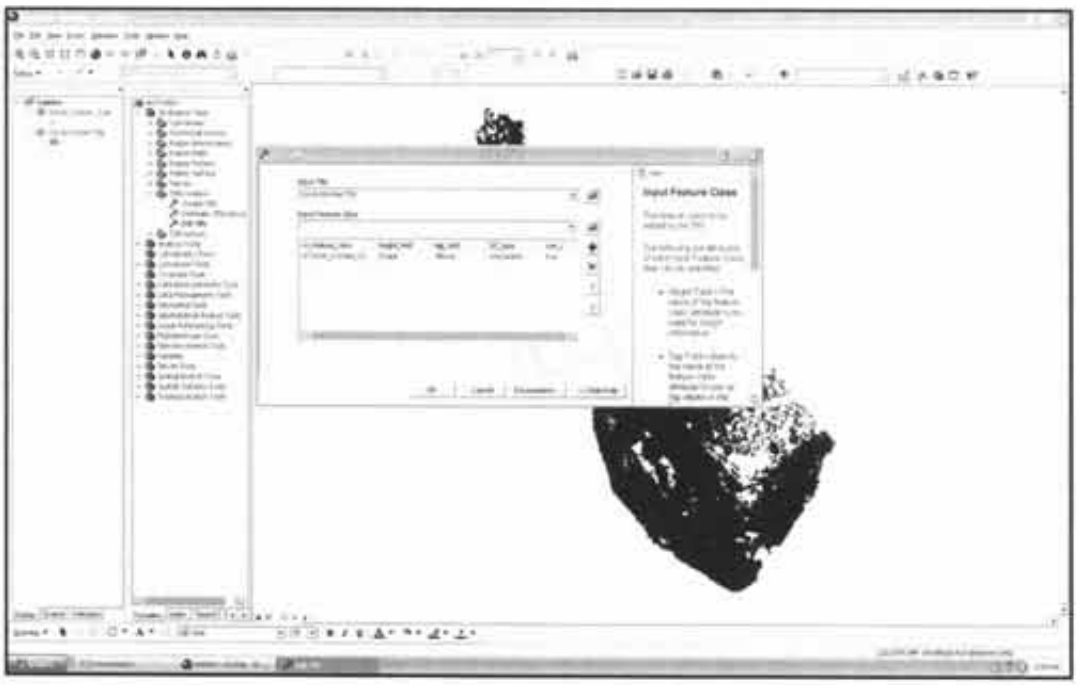

Figure 6. Building the TIN in ArcMap GIS.

related to the orientation of the TIN, but we have yet to resolve the issue.

On the other hand, we now had an accurate three-dimensional representation of the surface of Devils Kitchen, down to a very fine resolution (Figure 7). We could look over, under, and even through the rocks. We could see relationships between panels and boulders clearly, and did not have to contend with vegetation obscuring line-of-sight. The fine-grain scans provided objective representations of panels without distortion. The public outreach potential was apparent on the first virtual fly-though.

Integrating field data into the map

At this point, we had a great visual representation of our site area, but it lacked substantial relationship to the panel data URARA had collected. In order to make this map a useful tool for furthering our understanding of Devil's Kitchen, we needed a way to link the data we had collected in the field into the 3-D map.

An early attempt at this process involved simply adding graphic labels into the ArcScene map. We attached the labels to graphic points which we placed in the vicinity of the GPS panel locations. The graphics had to be placed individually, and they did not link to any GPS data.

We hit upon a superior solution when we found a hyperlink command for ArcScene on the web. First, we hyperlinked the panel photos to the GPSed panel points in ArcMap (Figure 8). From there, it was as simple as opening the hyperlinked panel point Shapefile over the TIN, selecting the "information" icon, and double clicking the desired point from the panel file (Figure 9 and 10). Voila, the linked information comes up, making this a truly interactive three dimensional site map. The ArcScene hyperlink utility, including a short demonstration movie, is currently available at http://arcscripts.esri.com/details.asp?dbid=12615.

The hyperlink could be used to bring up site forms, photos, or any other data in a Microsoft Word or .pdf format (Figure 10). The data is directly linked to the GPS points collected in the field, and all of the data for a panel is effectively integrated into a single three-dimensional map. A limitation of this method is that the hyperlinks could only point to one location at a time, and if the data was moved, the link was effectively broken.

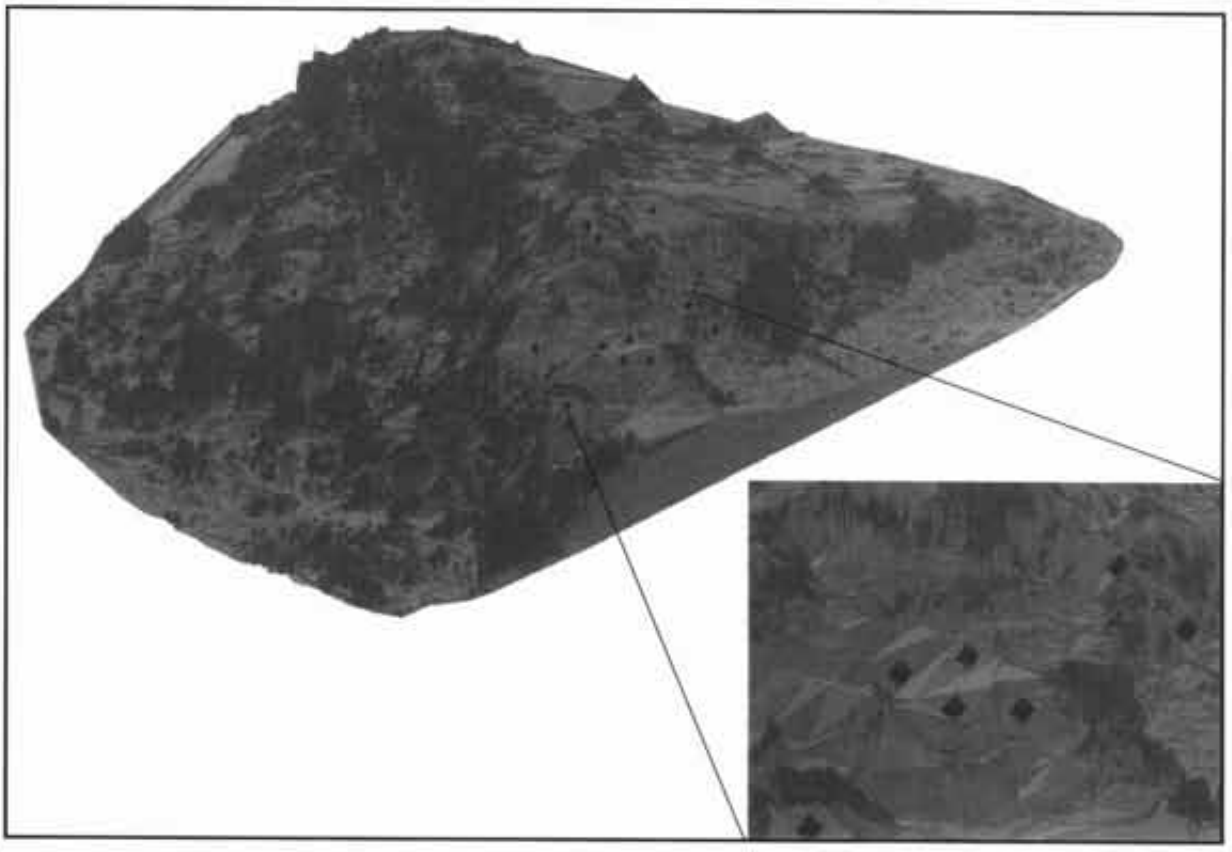

Figure 7. Elevation view of TIN with close-up view of rock art panel points.

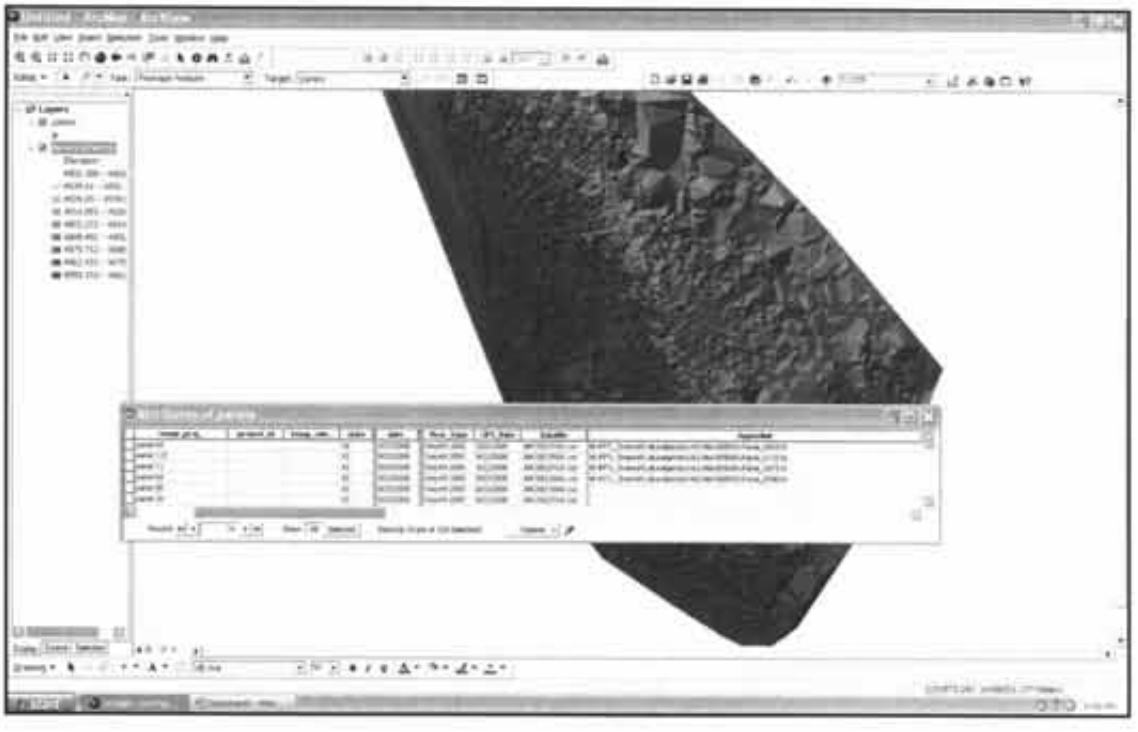

Figure 8. Adding hyperlink data to panel points in ArcMap.

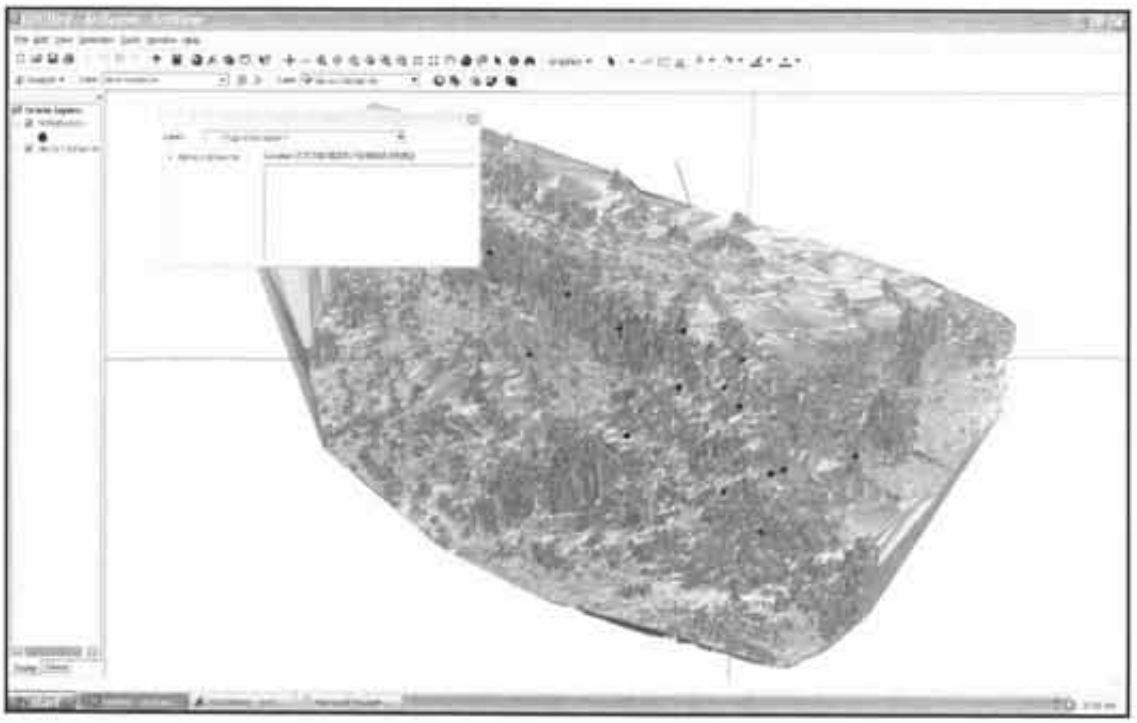

Figure 9. Using "information" tool on hyperlinked panel points.

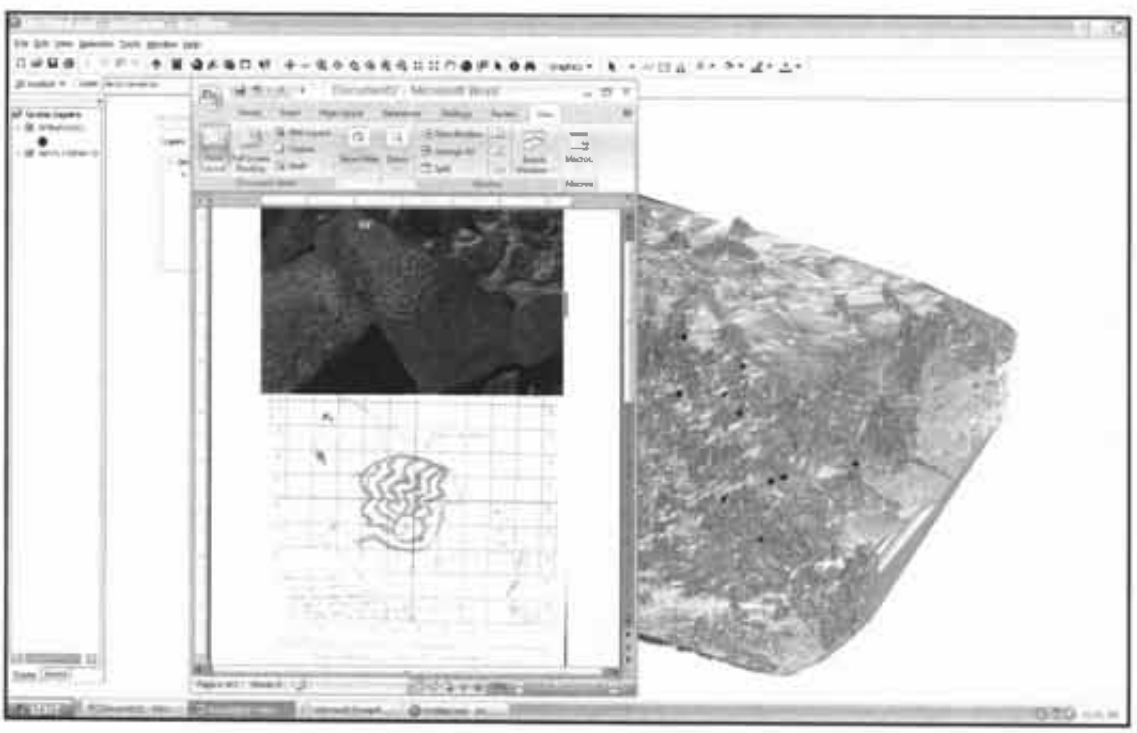

Figure 10. TIN displayed in ArcScene with hyperlinked rock art panel data.

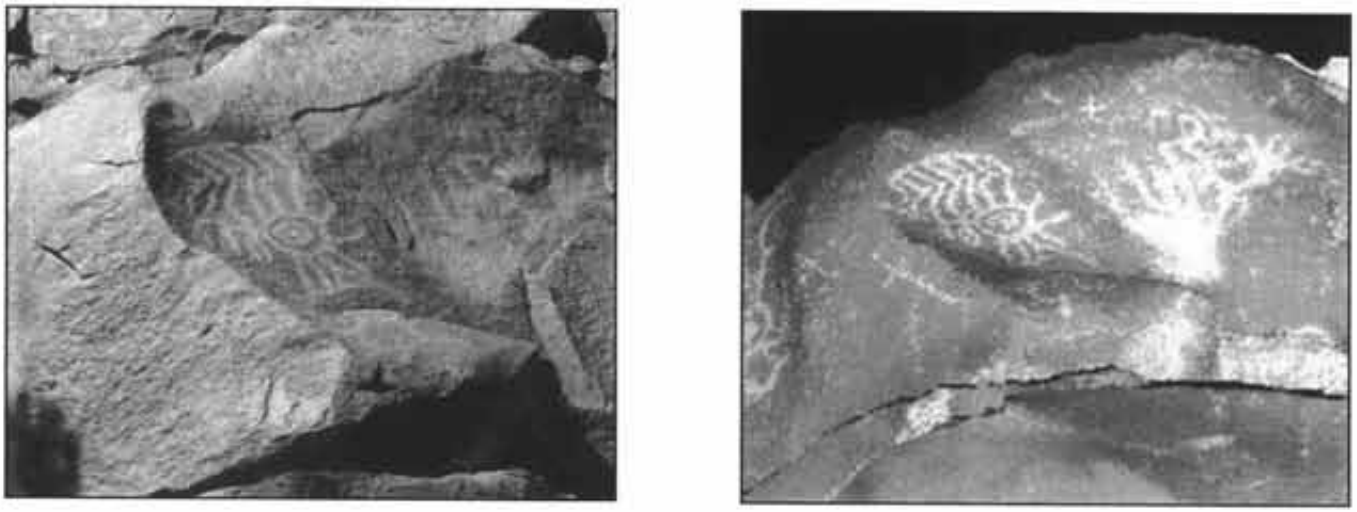

Figure 11. Photo and laser scan image of rock art panel #47 (Courtesy M2 Technical Services).

Results

Overall, we were very pleased with the results of this exercise. The goal of creating a three dimensional map, accessible in ArcGIS, was met and data collected in the field was integrated into the map in a meaningful way. We achieved accurate panel locations with objective panel images (Figure 11). We look forward to sharing these results with a broader public through presentations, public outreach, and perhaps even some linked animation clips on our website. Eventually, we hope to incorporate the information into a virtual tour.

The enormous size of the files and their effects on various computers is not yet resolved in our office setting. We do not have a way to make the data truly portable or available to the public. Other considerations include archiving the data so that it won't become obsolete in the face of ever-evolving software, the expense of bringing in a scanning professional, and physically accessing the site with the bulky scanner equipment.

We look forward to overcoming some of these challenges in the future, especially as we now have 2007 scans of the Cottonwood Wash and Mountain Home sites. M2 has completed successful scans of rock art for other agencies, including a detailed scan of pictographs for the National Park Service. The 3D laser scan process has proven itself as an accurate and economical approach to rock art recording. We now need innovative solutions to take full advantage of this powerful tool.

Acknowledgements: We would like to thank Ken Mears of M2 Technical Services for introducing us to the exciting world of three dimensional laser scans, going above and beyond to get the work done, and unending patience with our technical questions. We would also like to thank URARA for three great years of rock art recording for FFO. You make us look good! Our friend and colleague Dawn Elkington, GIS-girl extraordinaire, was unable to contribute to this article as we had planned. She held our hand and laughed us through this project as she did through many crises and celebrations, and she is missed.

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A Shaman's Pipe/Sucking Tube from the Great Salt Lake Region

Mark Stuart

A large stone pipe or tube comprised of 15 individual fragments was found near Plain City, Utah by Joseph Skeen in the mid to late 1800s. The object was passed down through the Skeen family until it was examined by the author in 1988. A proposition is made that the large cigar shaped artifact may be a shaman's sucking tube reminiscent of artifacts found in southern Idaho and Wyoming.

The purpose of this article is to document and describe a rare and unusual artifact that came into my possession a number of years ago. The artifact is a Shamans pipe or sucking tube. Although this type of artifact is widespread throughout North America it is fairly rare in good archaeological contexts.

Discovery

Joseph Skeen was one of the original founders of Plain City, Weber County, Utah. He originally came from Lehi, Utah County, Utah where he had heard of the "Big Plain", northwest of Ogden City, from citizens who moved south during the so-called Utah War of 1857-1858 (Hunter 1944). Skeen heard of a plain that extended for miles covered with rich native grasses and sage brush 4 to 10 feet tall where the people of Weber County would graze their livestock. Upon settlement of the area in 1859, part of the Skeen farm included the land south and west of Plain City on the north bank of the Weber River. The ground was sandy but fertile due to the occasional flooding of the river during the spring.

The stone pipe reported here was found in pieces when the land was first cleared of vegetation and leveled for agricultural purposes. At the time of the discovery, Skeen reported the pipe was in pieces that were found in close proximity to each other with all visible fragments collected (R. L. Miller, personal communication 1988). The fragments were carefully pieced together by his wife Charlotte. The pipe then resided in a china cabinet which was passed down through several generations of the Skeen family. I obtained the stone tube from Joseph's great-great grandson when his grandmother passed away in 1988 and the old china cabinet was cleaned out. The pipe was about to be thrown away when the great-great grandson retrieved it from the garbage and gave it to me.

Description of the Site

R.L. Miller, a Skeen descendant, farmed the old family homestead until the late 1960's when the land was sold for residential development. The land would become the Glenhill and Pioneer subdivisions of the rapidly growing town of Plain City. On a visit with Mr. Miller in 1988 at his home in Ogden he showed me 7 complete oval one hand manos, 28 loaf shaped two hand manos, two long roller pestles, and a large ground slate object of unknown use he had collected from the site during his farming days. When asked about projectile points he said he didn't have many because they were hard to see from a tractor. He

also showed me three Desert Side Notch projectile points and a Rosegate Corner Notch point all made of obsidian. He related that at one time he had two complete grinding bowls that I assume were metates. Mr. Miller also mentioned that his farm was completely void of stone except for what he called "Indian Rocks". I suspect these items are pieces of fire cracked rock (FCR) from hearths and/or roasting pits.

George East, an early settler in the area related that as a boy he could remember the Shoshone Indians annually camping on the low sand hills on the Big Bend of the Weber River south of Plain City (R. L. Miller, personal communication 1988). He stated they would ride their horses into the expansive wetlands to the west to hunt, fish and collect wild plants and seeds. His descriptions of these camping places match the pipe locality.

A quick reconnaissance of the Glenhill and Pioneer subdivisions revealed that little of the site remains undeveloped. The only artifacts visible on the surface were one end scraper made of brown striped tiger chert from Southwestern Wyoming and a few pieces of FCR along a newly constructed fence line. Conversations with several of the area residents revealed they had occasionally found projectile points and grinding stones in their gardens and yards. One resident showed me a few Desert Side Notch projectile points and a broken quartzite blade. These artifacts suggest a Late Prehistoric occupation although earlier occupations are likely.

Description of the Pipe/Sucking Tube

The stone pipe or tube (Figure 1) was assembled from 15 large fragments. Four small pieces were not recovered but their absence does not distract from the overall appearance of the artifact. Older looking impact fractures are located 5.5 cm from the proximal end and may indicate that the tube was purposefully broken as these breaks are much different from the few fresh plow marks. Because the fragments were in very close proximity when found (as if in a pile), it is possible that they may have once been in a bag or container of some kind.

The tube is cigar shaped, 21 cm long and 3.5 cm wide at its mid point tapering to 2.5 cm at each end. At the proximal end, a 0.3 cm carved ridge separates the mouth piece from the rest of the body. The mouth piece is slightly polished and worn from use. At the distal end a circling groove has been carved.

The pipe is made from beautiful mottled gray-greenish volcanic stone which comes from an area north of Spokane, Washington (Dr. Richard Moyle, Weber State University Geology department, personal communication). Dr. Moyle reports that when first quarried the stone is soft and easily carved, but hardens over time. The outside of the tube is well smoothed, but bears some striations which may be from the shaping process. Some of the small pits in the stone have traces of red coloring and suggest that at one time the tube may have been coated with red hematite or ochre. It appears that the tube was drilled from both ends meeting a little bit off center in the middle. Overall, the pipe is a beautiful piece of prehistoric craftsmanship and was probably a highly valued possession of the owner.

> The size, shape, and lack of staining suggest the pipe/tube was not used for smoking, but may be a shaman's sucking tube. Sucking tubes were employed by medicine men or shamans in treating sick patients. The tubes were used in either blowing upon the patient or in pretending to suck the illnesses out of a patient's body and then spitting out a small object such as a small frog, stone, or piece of bone (McGuire 1899: 386-390; Mails 1972:112-115 and 123).

Comparisons

Tubular stone pipes and/or sucking tubes have been documented over much of western North America and only a brief regional comparison is mentioned here. Frison describes six broken and refitted carved stone pipes or tubes recovered at the Coal Draw site in the southern Big Horn Basin of Wyoming (Frison and Van Norman 1993). In addition there were pieces of five others and an unbroken pipe stem. Several different types of

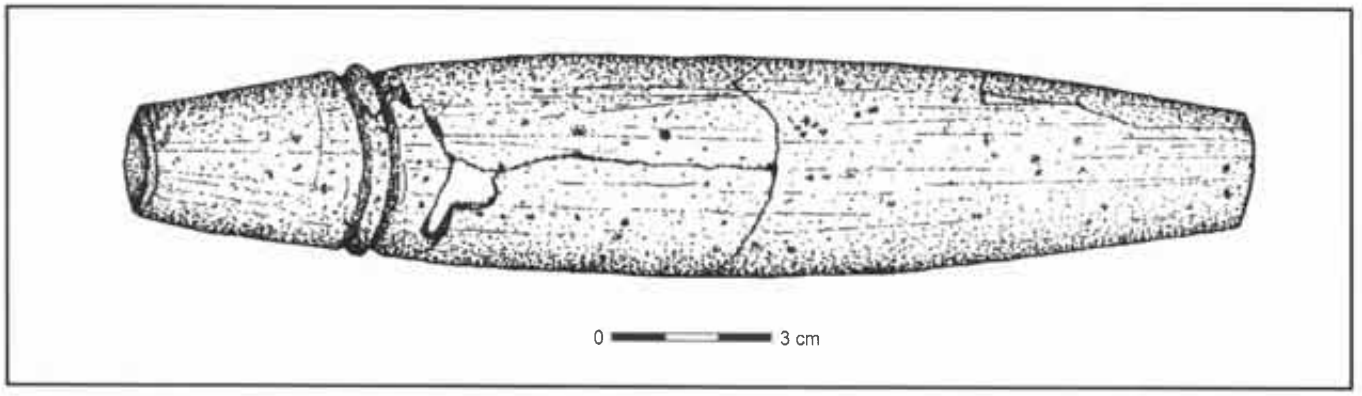

Figure 1. Drawing of the pipe/sucking tube.

carvable stone were represented, none of which appeared to be found locally. Frison indicates that the pipes/tubes may have been associated with a human burial at the base of a large Dinwoody style petroglyph panel. He also suggests that the artifacts were ritually broken while inside containers such as pipe bags and that they were not removed afterward.

Two pipes/tubes were found close together on a beach bordering the American Falls Reservoir in southeastern Idaho less than 100 miles from the Plain City pipe. The largest was made of fine grained off white stone (Butler 1968) and is 17 cm long with a localized dim red stained pattern. The other tube was made of dark steatite and was shorter than the first. From the dimensions given, Butler suggests the tubes were Shamans sucking tubes rather than smoking pipes. An undecorated pipe or tube of fine grained mudstone 9.4 cm in length was recovered from the burial of a young adult female in the Snake River Canyon in Idaho. Age of the burial was estimated to be between AD 700 and AD 1300 based on artifact types (Gruhn 1960).

Closer to Plain City, a small tubular stone pipe was recovered in a cave on Promontory Point in the Great Salt Lake. Residue inside the barrel of the pipe, however, indicated that it was used for smoking (Steward 1937:80). In the Great Salt Lake wetlands, carved stone pipes of steatite and other materials occasionally occur and almost every private collector can produce one or two broken and/or complete specimens. These other pipes may have been used for smoking, as most are much smaller than the Plain City pipe and are stained.

Discussion

Archaeologists have established the existence of wide spread trade routes across much of North America. As far back as the early Holocene, Pacific coast shell beads and obsidian were being traded across the Great Basin (Hughes and Bennyhoff 1986). It is also assumed that much of this trade involved perishable items such as food, hides, etc. Ethno-historic accounts mention several major inter-tribal centers located at the Dalles on the Columbia River and the Mandan Villages on the Missouri River, with minor centers at Camas Meadows near Boise, Idaho, the Great Salt Lake region of Utah, and the Green River in Southwestern Wyoming (Hughes and Bennyhoff 1986). Through these trade centers moved shells, obsidian, food, hides, salt, and in historic times, horses, human slaves, guns, and pipes of Catlinite and various stone. Could it be that a pipe or sucking tube made of stone obtained from the area north of Spokane, Washington found its way into the Great Salt Lake region through one of these exchange routes? Although we may never know for sure, this appears a possible explanation.

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Book Reviews

House of Rain: Tracking a Vanished Civilization across the American Southwest. CRAIG CHILDS. 2006. Little, Brown and Company, New York, NY. xiv + 496 pages, photos, bibliography, glossary, and index. $24.99 (cloth), $14.99 (paper), ISBN-13:978-0316608176.

Reviewed by Steven Simms, Utah State University

Craig Childs writes about deserts by telling stories about what most people think deserts have little of—water. Perhaps best known for his book *The Secret Knowledge of Water*, this time Childs employs water to carry a remarkably perceptive argument about the Anasazi. This is not a scholarly book about everything Anasazi. It is about ancient perceptions of landscape and place, as seen through Anasazi mobility. *House of Rain* is a narrative that ranges from desert adventures to conversations with archaeologists, to syntheses of a lot of complex information without ever being dry and academic. The story begins in Chaco Canyon and follows a metaphorical group of migrants north to Mesa Verde, on to southeastern Utah, and like the Anasazi, inexorably south. But unlike most of the Anasazi, Childs keeps them moving right on in to northern Mexico. He does this not to rehearse the well-worn argument of Mesoamerican connections. Childs obviously reads enough archaeology, but more importantly talks with enough archaeologists to know better than this. He is making the case for an expansive sense of place held by the ancient inhabitants of the Southwest—one that transcended the ethnic diversity, the subcultures, and even the episodes of violence.

Skeptical at first of yet another "pop" book on the Anasazi, but impressed by Childs previous work, I decided to pursue this read not as a literal recitation of fact, but in the abstract to look for something deeper. *House of Rain* is science and nature writing that conveys a sense of what some scientists suspect and feel, but cannot or will not engage in their technical reports and journal articles. Childs makes the case that the scale of human perception of the Southwestern landscape was far more encompassing than one of small-time farmers in this or that valley who didn't get out much except to "trade" for "exotics." He argues that mobility was so embedded in world view that it was an expected fact of life. Migration, not just mobility, was based on extensive geographic knowledge beyond the places where each individual personally experienced, but that was known and woven together by a social tapestry of kinship, alliance, and violence.

Some, especially some Southwestern archaeologists, may quibble with details in the book and even its larger claims – but more so if they read literally rather than metaphorically. Childs tips his hand early that metaphor is his intent by pointing out that peoples and cultures don't vanish, but civilizations do. He is quite aware of the links between the ancient and the modern tribes. He is also attuned to the perils of using the term Anasazi in a politically correct world—and knows that the currently popular moniker of Ancestral Puebloan does not go over with everyone; listen to what some Navajo think about the term. But Childs is writing for the non-specialist, and he is realistic enough to know that the American public still calls them "Anasazi."

Many archaeologists will recognize that Childs is attuned to archaeology beyond those archaeologists he includes in the book. The work of Stephen Lekson comes to mind, who reminds us that our scales of analysis are often too small (Lekson 1996) and that migrations were socially organized, frequent, and substantial (Lekson 1999). Aspects of Childs narrative evoke the work of Margaret Nelson and Michelle Hegmon who remind us that abandonment is not a failure, but a successful way of life (2001). Childs braves the dangerous waters of speculation by playing out in narrative form, what many Southwesternists suspect, but for various reasons, articulate less than they perhaps should.

House of Rain is an ambitious book that wants to tell something big and abstract about the Anasazi—something much more than a popular message about ancient maize farmers, their pottery, and houses, or generic homage to their sacredness, their celestial knowledge, and the astronomical alignments of their architecture and rock art. There is more to the Anasazi than the never-ending production of photographic coffee table books and of guide books describing how to get to remote places that would be better left remote.

House of Rain has already generated controversy. Five anthropologists associated with the American Museum of Natural History wrote a letter to the Editor in the May 2007 issue of the *SAA Archaeological Record.* They only read an excerpt from the book, but claimed Childs "insults the descendents of the ancient people who are the subject of the narrative." They seek to disassociate the book from the archaeological profession. Another letter by a prominent Southwestern archaeologist followed in the September 2007 issue of the *SAA Archaeological Record.* It defended Childs book and reminds archaeologists that we often "do a poor job of representing ourselves to the public." I agree, and think we are not as effective when we admonish and preach rather than teach.

Archaeology needs books like *House of Rain,* and needs archaeologists to help spread the subtle messages found in books like this—after all, it is archaeologists who nursed many of these understandings even if we are slow to articulate them.

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Colorado Prehistory: A Context for the Southern Colorado River Basin. Edited by WILLIAM D. LIPE, MARK D. VARIEN, and RICHARD H. WILSHUSEN. 1999. Colorado Council of Professional Archaeologists. 518 pages plus annotated bibliography, 58 maps and illustrations. $42.00 (paper), ISBN-10:0874807115.

Reviewed by Jody J. Patterson and Keith R. Montgomery, Montgomery Archaeological Consultants, Inc.

Although the primary purpose of the work, like the others in the series, is to provide an environmental and prehistoric context for a specific portion of Colorado, particularly in regards to assisting "archaeologists and others in evaluating archaeological sites with regard to criteria of the [NRHP] (pg.1)," it is also a veritable encyclopedia of information useful far beyond its geographical scope. The editors, who are amply qualified and knowledgeable about the subject of the book,

present a detailed and practical reference for those working in extreme southwestern Colorado, as well as immediately adjacent areas of the Four Corners region, including San Juan County, Utah. More specifically, the geographic focus covers the area between the Colorado-New Mexico Border as far north as Dove Creek, Co. and from the Colorado-Utah border east the edge of the San Juan Mountains. Given the nature of the book, we do not attempt to review or critique the information provided, but instead will comment on the value of the book in terms of its organization and usefulness to its stated purpose.

The format of the book is typical of prehistoric cultural contexts. The first three chapters consist of an introduction, a review of the past and present environmental setting, and a history research on the fundamentals of Southwestern archaeology, including the major institutional and cultural resource management projects that have occurred therein. The bulk of the book details the different prehistoric periods including the Paleoindian and archaic periods (Ch. 4), the Basketmaker II-III periods (Ch. 5 and 6), the Pueblo periods (Ch. 7-9), and the post-Puebloan occupation (Ch. 10). The last two chapters cover Native American concerns and issues and a general conclusions. In addition to the references cited, the editors include an annotated bibliography with synopses of not only major peer-reviewed works, but also numerous useful reports that are often lumped into the category of "gray literature."

The introductory chapter explains the editors' theoretical orientation and assumptions regarding their interpretation of the information to follow, allowing the reader to better comprehend their perception of the material and of the concepts they present. The editors refer to their orientation as "expanded processual," which calls the reader's attention to the fact that, in some instances, post-processual research foci and interpretations enter into processual approaches. Several of the assumptions made explicit by the editors include an empirical and positivist orientation, a rejection of a normative epistemology, and a general skepticism of the usefulness of traditional cultural histories beyond a heuristic level. The chapter also provides an outline of the editors' orientation toward cultural resource management as it pertains to conservation and public benefit.

Each period chapter is organized in a similar manner, which makes cross-referencing material from different periods an easy task. In each chapter the topics include a brief overview of research related to the chapter's temporal focus, a detailed chronology, a description of some of the major site excavations and their findings, a description of site types, an overview of the settlement system (including settlement, subsistence, and mobility patterns), and carefully considered ideas concerning pertinent research directions. The editors stay away from a cookbook approach to identifying and classifying sites based on artifact assemblages and feature characteristics relying instead on an examination of spatial variability settlement systems throughout southwestern Colorado and surrounding areas. This variability underlies their call for additional data requirements and their discussion of research issues needing further examination and study. Data needs and research issues vary considerably from one period to the next, and correlate directly with the amount of previous research. For example, data needs for the Paleoindian and Archaic periods focus on the identification of additional sites to augment the relatively scant number of known sites. By identifying additional early sites, it will be possible to more fully delineate general temporal trends, regional variation, and early transitional phases. In contrast, the data needs and research foci for the P III period include topics such as demographic fluctuation, the empirical testing of mobility models, and further data and hypothesis-testing concerning conflict and warfare during this period.

Chapter 11, titled "Native American Issues and Perspectives" is the most enlightening chapter. The chapter is a broad overview of Native American issues as they pertain to various federal laws—e.g., NAGPRA, NEPA, and AIRFA. In addition, it covers

the implications of these laws to cultural resource management and problem-oriented research, ideas and approaches to conducting consultations, and the synthesis of disparate perspectives (indigenous vs. scientific) of the archaeological record. The chapter also presents the results of interviews conducted by Crow Canyon personnel with four members of the Crow Canyon Native American Advisory Board. In these interviews, not surprisingly, the subjects emphasize the early importance of collaboration between archaeologists and Native Americans; they address research topics that are of significance to Native peoples, and stress the need to avoid disturbing or excavating human remains and associated objects. Overall, the results of the interviews suggest that archaeology can play a meaningful role in preserving Native American culture. This section flows seamlessly into the last section of the chapter that presents a Native American view on cultural and linguistic preservation and the role archaeology (and literacy) could play in preserving various Native American traditions and language.

The final chapter, "Concluding Comments," reviews major temporal patterns of demography, land use, subsistence, and material culture. The editors list potential studies and practices useful from research and land-management perspectives and make recommendations concerning public and Native American participation in the process of archaeology and the conservation of the record.

The editors have produced a volume that is well organized, insightful, and practical as a reference and context. Although it has been 10 years since the book's release, it remains the most comprehensive resource available for the area. The book offers ideas, perspectives, and approaches that could greatly benefit archaeological investigations in southeastern Utah.

Utah Archaeology Index 1988 – 2004

*The articles, reports, notes, photo essays, comments, and book reviews for the Utah Archaeology issues from 1988 to 2004 are listed here. The official abstract was included whenever possible. However, because the 'comments' section is often very short, no abstracts were listed for these pieces. Also, some 'notes' section abstracts were pieced together by the editors from article introductions. When such was the case an * follows the title.*

1988

ARTICLES

Fluted Projectile Points in Utah

James M. Copeland and Richard E. Fike

The locational and morphological characteristics of 43 Clovis and Folsom projectile point specimens from 40 locations in Utah are described. Morphologically, they fall well within the range for specimens from other sites outside of Utah. While the number of finds argues for the presence of Late Pleistocene and early Holocene human populations in Utah, a direct association with extinct megafauna remains has not yet been verified.

Changes in Anasazi Perceptions of Household and Village Space at Nancy Patterson Village

James D. Wilde and Charmaine Thompson

Illuminating changes in Anasazi household units, made up of associated habitation and storage rooms, as well as socio-religious structures such as kivas, was the primary aim of research at Nancy Patterson Village. The focus on households representing the two most intensive occupations at the site, during late Pueblo I and early Pueblo II, and then again during middle to late Pueblo III, allowed a detailed look at prehistoric uses and perceptions of space. We argue that an open posture, possibly related to a commitment of interaction at the household, community and regional levels, characterized the first major occupation. Evidence from the Pueblo I/II household and nearby open socio-religious structure can be extrapolated to the village, suggesting Nancy Patterson's role in interacting or controlling communication and transportation up and down Montezuma Canyon. This is compared to an apparent contraction of household space, limiting it to increasingly defined interior areas during the middle to late Pueblo III occupation. The latter suggests a decreasing commitment to community and regional interaction, giving the impression of a group of closed, withdrawn households, forming a poorly integrated community that was abandoned near the end of the thirteenth century.

REPORTS

An Unusual Cache of Painted Bison Bone From Box Elder County, Utah

Mark Stuart

The purpose of this article is to document a cache of painted bison bone in the Joseph Pauli collection of Ogden, Utah. Joseph or "Joe" Pauli was a hobbyist of many interests who made several large collections of specimens including rocks and minerals, historic Mormon and Chinese items and both prehistoric and historic Indian artifacts. I interviewed Mr. Pauli and examined his collection

in 1981. Mr. Pauli passed away in February of 1988 and his heirs have retained possession of the collection. Many of these Indian artifacts were collected during the winter months, when snow made agricultural pursuits impossible. During this time, Mr. Pauli and several associates would make random excavations into the numerous caves and rockshelters in the Promontory-Blue Creek area at the northeast edge of the Great Salt Lake (Figure 1). These non-professional excavations covered a period of time from the 1930 to the early 1950. After about twenty years of collecting, Pauli had accumulated an extensive collection of artifacts, ranging from the more common stone, bone and pottery artifacts to many perishable and unusual items. These artifacts represent thousands of years of prehistory in the Great Salt Lake region. Some of the more interesting artifacts in the Pauli collection are painted bison bone artifacts described here.

Utah Radiocarbon Dates I: Pre-1970 Dates*

David B. Madsen and Dyan Rowe

The following compilation of radiocarbon dates is ultimately derived from an extended personal search for the "Texas dates" from Danger Cave. As part of a recent research project at the site, we attempted to correlate existing dates with newly run dates from the site and continually ran across obscure references to a set of dates which had not been published in any of the original work or in the many subsequent archaeological and paleoenvironmental studies based extensively on the Danger Cave chronology. In short, it became evident that publication of a list of radiocarbon dates from Utah, together with a commitment to update that list on a regular basis, was a necessity.

The Loa Obsidian Cache

Joel C. Janetski

In 1977 two residents of Loa, Utah, were hiking on a ridge above Road Creek north of their home town, when they observed a shining reflection from under one of the thousands of basalt boulders that cover the ridge. Upon closer inspection they discovered a cache of large obsidian artifacts which they carefully removed. The existence of these artifacts was brought to the attention of the Office of Public Archaeology at Brigham Young University who contacted the discoverers and received permission to study the cache. In February of 1987 the authors visited Loa and photographed, sketched, and took small samples of each artifact for sourcing. Later, authors Wilde and Janetski visited and recorded the site where the cache was located.

BOOK REVIEWS

Anthropology of the Desert West – Essays in Honor of Jesse D. Jennings, reviewed by Robert B. Kohl

The Pinenut Site: Virgin Anasazi Archaeology on the Kanab Plateau of Northwestern Arizona, reviewed by David R. Wilcox

1989

ARTICLES

Giving Form to the Formative: Shifting Settlement Patterns in the Eastern Great Basin and Northern Colorado Plateau

Richard K. Talbot and James D. Wilde

Analysis of over sixty radiocarbon and tree-ring dates from structures at Five Finger Ridge, in central Utah, suggests that periods of increased and decreased building and occupational activity characterized the history of the site. Similar analysis of dates from reported Fremont sites in Utah, Colorado, and Nevada shows nearly identical patterns, representing periods of increased and decreased human settlement activity throughout the Fremont area. This temporal pattern is translated into a spatial analysis of settlement,

showing periods of aggregation and disaggregation at particular sites. In addition, the patterns provide evidence of expansion and contraction of long-term occupation sites from a central "core area" along the Great Basin/Colorado Plateau Transition Zone. This diachronic view of flux in Formative settlement patterns provides a new perspective of Fremont culture history and socio-economic adaptations.

Redefining Fremont Subsistence

Nancy D. Sharp

Both description and explanation of Fremont subsistence have proved elusive for several reasons, including the typological emphasis of earlier approaches, and a lack of reliable subsistence data from Fremont sites. Recently developed theoretical and analytical frameworks establish the relevance of extant faunal data to understanding Fremont subsistence, and the possibility of more detailed interpretation and comparison of Fremont faunal exploitation. These positive developments are balanced by increasing awareness of the range of cultural, taphonomic, and recovery processes affecting faunal assemblages. The problems and potential of current approaches are illustrated by comparison of faunal data from 17 Fremont sites, and an examination of the small artiodactyl assemblage from Nawthis Village in central Utah.

Implications of Early Bow Use in Glen Canyon

Phil R. Geib and Peter W. Bungart

The concept of a Proto-Fremont, terminal Archaic culture is proposed to distinguish in situ populations occupying portions of the northern Colorado Plateau from contemporaneous, but culturally unrelated, Basketmaker II populations of the southern Colorado Plateau. One key difference between these groups was early (ca. A.D. 100) use of the bow by the ancestral Fremont, while the ancestral Anasazi continued to employ the atlatl. The time lag for diffusion of bow technology to the Anasazi could be attributable to competitive relationships. The bow might have been the competitive advantage that allowed local ancestral Fremont populations to maintain occupancy of their traditional territories in the face of expanding Basketmaker II agriculturalists. In order to understand the Archaic-Formative transition on the northern Colorado Plateau, it is important to know whether local Archaic populations existed at the time that agriculture was introduced. The processes involved in this transition and the particular nature of its historical expression depends on whether farming was transferred to Archaic populations or involved the spread of cultural systems already somewhat dependent on agriculture.

REPORTS

Bone Whistles of Northern Utah

Dann J. Russell

The Great Salt Lake Fremont peoples made extensive use of the bone refuse from various wild game they hunted as is evident from the numerous bone awls and other tools that have been recovered. Knives and saws made from deer and mountain sheep scapulae are also fairly common, although they are rare in other parts of the state. In addition, Great Salt Lake Fremont sites are somewhat unusual in that they contain large numbers of bison and waterfowl bones. From the latter the Fremont made bone whistles, an artifact considered to be characteristic of this variant (Marwitt 1970:145).

42MD300, An Early Holocene Site in the Sevier Desert*

Steven R. Simms and La Mar W. Lindsay

Two radiocarbon dates retrieved in 1985 from 42Md300, a site in the Sevier Desert of western Utah (Figures 1 and 2), indicate that typologically early cultural material was probably deposited between 7,700 and 9,500 years ago and possibly

between 7,710 – 10,430 years ago. The significance of 42Md300 has been well established, and validated by inclusion on the National Register of Historic Places. However, when the site was nominated its chronology was entirely dependent on typological cross-dating. Given the broad time span suggested by the artifacts from the site, some attempt to obtain absolute ages seemed appropriate prior to more intensive investigation. This paper reports on fieldwork conducted in 1985 by Simms, which was designed to ascertain bracketing ages for the cultural material at the site. All the material appeared to be eroding from one stratigraphic zone which suggested the possibility of obtaining samples of shell and sediment for radiocarbon dating from deposits bracketing the level of origin of the cultural material.

The Lime Ridge Clovis Site

William E. Davis

In 1985 Abajo Archaeology conducted archaeological investigations at the Lime Ridge Clovis site, located 15 kilometers southwest of Bluff, Utah. The site, designated 42SA16857, is the first known Clovis Utah site on the northern Colorado Plateau documented with chronologically distinctive artifacts (W. Davis and Brown 1986; Green 1978).

Sandy Ridge: An Aceramic Habitation Site In Southeastern Utah

Lane D. Richens and Richard K. Talbot

The Sandy Ridge site (42Sa18500) is located in the northeastern portion of Dry Valley, south of Moab, Utah and the La Sal Mountains, at an elevation of 1,860 m (6,100 feet). This area is dominated by low sage and grasses, with pinyon and junipers abundant only around mesa edges and on mesa tops. The site was first encountered in 1987 during seismic exploration in the area. While cutting a road down a high narrow ridge top extending outward from a high and imposing, steep-walled sandstone mesa (Figures 1 and 2), the bulldozer operator noticed a small metate fragment and very light ash-staining in the cut. An archaeologist from the Office of Public Archaeology (OPA) at Brigham Young University visited and recorded the site. Two small test pits were dug into the ash-stained area to confirm cultural depth. Upon receipt of an ARPA permit in late spring, 1988, excavation was initiated at the site. Ultimately, excavation revealed a rather large circular pit house containing at least one very large bell-shaped pit and several small subfloor pits. A large, partially slab-lined hearth was also present as were numerous artifacts. Macrobotanical samples retrieved from the floor and subfloor features indicated high percentages of Cheno-Ams and another plant type tentatively identified as St. Johnswort. In addition, charcoal samples submitted for radiocarbon dating indicated that occupation occurred at about A.D. 200.

A Preliminary Report of Archaeological Excavations at Antelope Cave and Rock Canyon Shelter, Northwestern Arizona

Joel C. Janetski and James D. Wilde

Archaeological research on the Arizona Strip generally and the Uinkaret Plateau specifically has been sparse (see Altschul and Fairley n.d. and Westfall 1987 for reviews). The reasons for this are not clear but are likely related to the geographical and political isolation of the region. The majority of the recent work done in this portion of the Arizona Strip has been survey related to development activities such as transmission line and road construction (e.g., Davis 1982; Moffitt et al. 1978; Wade 1967) and Bureau of Land Management (BLM) surveys related to mineral and range programs (Aline LaForge, personal communication 1989). Excavations at Antelope Cave have been the exception (see section below on Antelope Cave). In 1983 Brigham Young University (BYU) entered into a cooperative agreement with the BLM, Arizona Strip District, to assess several sites deemed significant by BLM personnel and to complete analyses of

data recovered from Antelope Cave in the 1950s. Research interests behind these investigations consisted of fundamental questions related to chronology, subsistence and settlement. The tests at Antelope Cave and Rock Canyon Shelter have been made under this ongoing agreement and with these general issues in mind. The data presented here are preliminary only. Complete data sets and stratigraphic profiles will be included in the final reports currently in preparation.

REVIEWS

The Practical Archaeologist and the Archaeologists Handbook, reviewed by Robert B. Kohl

1990

ARTICLES

Fremont Transitions

Steve Simms

A historical preoccupation with defining the Fremont has outgrown its usefulness. The concept is a stereotype, routinely confusing the variables of material culture, techno-economic patterns, language, and ethnicity. This presents a naive and reductionistic scenario of prehistoric cultures to the reading public. Acknowledging Fremont unity, variability in the material culture of the time can be examined from a behavioral rather than cultural perspective. On-going study in northern Utah of the Fremont transition into archaeological obscurity and the subsequent Late Prehistoric period provides a context to examine a more dynamic approach. A working model illustrates the approach to the transition as an ecological phenomenon. Also, the relationship between the Fremont and the "Numic spread" hypothesis begs for critical examination and may be approachable with new evidence in the form of human skeletal remains form the Great Salt Lake.

Virgin Anasazi Architecture: Toward A Broader Perspective

Richard K. Talbot

A review of Virgin, Kayenta, and Mesa Verde Anasazi architecture suggests temporal and spatial variability in structural shape and the occurrence of certain internal features. This variability indicates that Virgin area architecture, although at times slow to develop, is generally much more dynamic internally than previously thought. It also suggests an adherence to the broad patterns of regional architectural change. Temporally variable economic and social requirements or pressures probably had the greatest impact on Virgin architecture. Placing Virgin Anasazi architecture in a regional context provides a better perspective on its origins and development.

Barrier Canyon Style Pictographs of the Colorado Plateau. Part One: Hypothesis and Evidence for the Existence of Post Circa A.D. 1300 Panels

Steven J. Manning

The date most commonly accepted for the creation and temporal span of the Barrier Canyon Style rock art of the Colorado Plateau is the Archaic period (ca. 7500-1500 B.P.) (Schaafsma 1986:225). A hypothesis is developed here that states many of the Barrier Canyon Style panels were constructed in circa A.D. 1300 to 1600. The Barrier Canyon Style may have developed or been introduced onto the Colorado Plateau in the Archaic period, but evidence advanced to date supporting this theorization is based upon conjecture and inference. Evidence for the extension of the Barrier Canyon Style, nearly to the Pueblo Historic Period, was initially indicated by the presence in the panels of elements strongly suggestive of fox pelt pendants. The fox pelt pendant, a characteristic feature of

the Kachina Cult of the southwestern Pueblos, has not been found in any archaeological context in the Pueblo area before circa A.D. 1500. It is believed that the Kachina Cult entered the Anasazi culture from the Jornada Mogollon between A.D. 1325 and 1350. The fox pelt pendant, apparently appearing about 150 years later, may have been incorporated into both the Kachina Cult of the Anasazi-Pueblo culture and the existing Barrier Canyon Style at about the same time. This appears plausible because of the proximity (and possible overlap) of the Barrier Canyon Style province with that of the Pueblo IV Anasazi. Evidence to support concurrent acceptance is the absence of any object comparable to the fox pelt pendant in all known rock art in Utah from all time periods except the Barrier Canyon Style. Additional detailed evidence is presented that supports the hypothesis. Included in this evidence is the first reported presence of bows and arrows in the Barrier Canyon Style, an apparent temporal relationship between the Barrier Canyon Style artists, and the early historic Pueblo artists, and parallels of the Barrier Canyon Style with the Kachina Cult.

REPORTS

Limited Excavations At Bighorn Sheep Ruin (42SA1563) Canyonlands National Park, Utah

Susan M. Chandler

Bighorn Sheep Ruin (42Sa1563) is a late Pueblo II-Pueblo III Anasazi cliff dwelling. The site is in the National Register of Historic Places Salt Creek Archaeological District of Canyonlands National Park, southeastern Utah. Bighorn Sheep Ruin has 28 structures along a relatively narrow ledge in a low alcove. Next to Big Ruin, it is the largest cliff site in the park. Bighorn Sheep Ruin was first recorded in 1930 as LS 14-11 by the Clafin-Emerson Expedition, led by Henry Roberts (Gunnerson 1969). The University of Utah rerecorded the site as 42Sa1563 in 1965 (Sharrock 1966). Nickens and Associates of Montrose, Colorado, performed limited stabilization at Bighorn Sheep Ruin in April 1985, under contract to the National Park Service, Rocky Mountain Region. Todd R. Metzger served as Stabilization Project Director. Susan M. Chandler and Gary M. Matlock directed the limited archaeological excavations conducted at the site as part of the stabilization effort. Reports detailing the stabilization activities (Eininger and Chandler 1986) and excavation results (Chandler 1988) are on file at the National Park Service, Midwest Archaeological Center, Lincoln, Nebraska.

A Wickiup Site in Box Elder County, Utah

Roy Macpherson

While conducting an archaeological survey of the Lake Bonneville shoreline (U-88-US-152bsp), a site featuring the remains of four wickiup structures (42Bo555), was discovered. The site is located in the Grouse Creek valley, 14.5 km south southwest of the town of Grouse Creek, Utah.

A Crookneck Wooden Staff from San Juan County, Utah

Nancy L. Shearin

On 20 December 1980 a crookneck wooden staff was discovered by Fred Blackburn, White Mesa Institute, Blanding, Utah, in a tributary canyon, northeastern drainage of Grand Gulch, San Juan County, Utah. This paper reports the location, collection, and curation of this well-preserved crookneck staff. The prehistory of similar artifacts from the Southwestern archaeological record is reviewed along with a historic account of ceremonial use. Implications concerning the function of the artifact with respect to cultural interaction, trade, and rock art motifs are discussed.

The Nine Mile Canyon Survey: Amateurs Doing Archaeology

Pamela W. Miller and Deanne G. Matheny

In the fall of 1989, fifty-one volunteers worked under the supervision of four professional archaeologists for five weekends to record cultural manifestations in Nine Mile Canyon, Carbon County. The project was conceived and organized by amateurs who obtained funding to hire the professionals. The leaders among the amateurs are graduates of Level III of the Utah Avocational Archaeologists Certification Program (UAACP). Many of the other participants have completed levels I and II of the program. In this article we briefly review the history and goals of the Nine Mile Canyon Survey and the results of the first season's work. The background of the certification program and the use of volunteers and certified amateurs on an archaeological project is discussed. We consider the value of such participation from the point of view of both amateur and professional archaeologists. The Nine Mile Survey 1989 was an interesting test of the certification program and the experience that we gained may be useful to others who are planning similar projects.

A Fluted Point from Clear Creek Canyon, Central Utah

Vonn Larsen

A fluted projectile point fragment was found near the juncture of Clear Creek and Single Creek Canyon in central Utah on July 16, 1989. Although fragmented, the point appears morphologically similar to Clovis styles found in Utah (Copeland and Fike 1988, Davis 1989). Sourcing of the artifact was pursued with the approval of the United States Forest Service (USFS) on whose property the point was found. After sourcing and photographing, the point was sent to Bob Leonard to be housed at the Fremont Indian State Park near Richfield. A few days after the discovery, Bob Leonard, the Fish Lake Forest archaeologist, and Jeri DeYoung, an archaeologist trainee with the United States Forest Service from Weber State University, accompanied me to the site location. Later I was informed that the point was found within the boundaries of a previously recorded site (42Sv1779). Trail Mountain Rockshelter (Janetski et al. 1985) is located 100 m to the south and a number of other sites are in the area (Robert W. Leonard, personal communication 1989).

COMMENTS

Evidence of Arrow Points from Basketmaker II Sites in Southwestern Colorado

Alan D. Reed

Pre-Formative Cultural Affiliation in Glen Canyon: A Response To Reed

Phil R. Geib

Comprehensive Rock Art Literature Search through the files of the Division Of State History, a Summary

Steven J. Manning

REVIEWS

Cultural Resource Inventory and Testing in the Salt Creek Pocket and Devils Lane Areas, Needles District, Canyonlands National Park, Utah, reviewed by Owen Severance

Archaeological Data Recovery at Three Prehistory Sites Located Along State Road 313, Grand County, Utah, reviewed by Kevin T. Jones

Archaeology of the Eastern Ute, reviewed by David B. Madsen

The Great Journey, reviewed by Bob Kohl

1991

ARTICLES

Paleo-Indian Occupation in the Eastern Great Basin And Northern Colorado Plateau

Alan R. Schroedl

A review of Paleo-Indian data from throughout Utah suggests that there were differences in the lithic technology and settlement and subsistence patterns between Paleo-Indian groups in the eastern Great Basin and the northern Colorado Plateau. Discussions of Paleo-Indian terminology, projectile point types, and evidence of subsistence patterns are presented. Differences between the Paleo-Indian occupation in the eastern Great Basin and the northern Colorado Plateau are discussed.

REPORTS

Sand Dune Side-Notched: An Early Archaic Projectile Point Type of the Northern Colorado Plateau

Phil R. Geib and J. Richard Ambler

Tipps et al. (1989:89-92) recently designated a tentative early Archaic point type for the Northern Colorado Plateau: Sand Dune Side-notched. The type was proposed to provide a named category for a shallowly side-notched dart point recovered from the surface of Salt Pocket Shelter (42Sa17092) in Canyonlands National Park, Utah (Figure 1), and for three similar points recovered from Sand Dune Cave in southern Utah (Lindsay et al. 1968:44), hence, the type name. The purpose of this report is to present additional data about this proposed point type, specifically with regard to temporal placement, geographical distribution, and production technology.

Split-Twig Figurines, Early Maize, and a Child Burial in East-Central Utah

Stephen C. Jett

Archaic Period figurines made of willow and other split twigs, found in caves in the Greater Southwest, have not only received the attention of scholars but have also captured the popular imagination to a significant degree (see Agenbroad 1990:27; Jacka and Jacka 1988: 102-03; Jett 1987; Jones and Euler 1979:1-4; Kelsey 1987:95, 97; Smith and Turner 1975:23; Schwartz [1989]:17-23, back cover; Thybony and Bean 1988:6). Split-twig figurines have appeared on postcards, one has become the cover logo of *The Journal of Ethnobiology* and another the logo of the Museum of Northern Arizona Collector's Club. The effigies have inspired such diverse popular objects as andirons at Grand Canyon National Park and women's earrings (Plateau Expressions 1989). And at the behest of a Flagstaff, Arizona, crafts dealer, some Havasupai have been making replica split-twig figurines during the last few years. One also may mention pictographs recently discovered on the northern side of the Grand Canyon that look very much like split-twig figurines (Allen n.d.:Figure 8b; Mary Allen, personal communication 1988; Schaafsma 1990). Despite the interest and activity of the archaeological community (see references in Jett 1987; Pierson 1980; and Schroedl 1988), none of these objects has been reported in any kind of specific archaeological context or associated with other diagnostic artifacts in a way that could reveal much about the cultural affiliations or functions of the objects. Some years ago it was proposed that most of the figurines from Arizona, California, and Nevada date from the second and third millennia B.C., and were used in sympathetic hunting magic, while those from the Utah Canyonlands region wer4e children's toys, dating from around the time of Christ (Schroedl 1977). However, the evidence for the latter use was circumstantial and the conclusions speculative.

Preliminary Report on Aspen Shelter: An Upland Deer Hunting Camp on the Old Woman Plateau

Joel C. Janetski, Richard Crosland, and James D. Wilde

During the summers of 1989, 1990, and 1991 archaeologists from the Office of Public Archaeology (OPA) at Brigham Young University in cooperation with the United States Forest Service excavated at Aspen Shelter (42SvI365) in central Utah. Support for the project was also provided by volunteer efforts from members of the Utah Statewide Archaeological Society from several chapters. This work was done under the direction of OPA archaeologists Joel C. Janetski and James D. Wilde. Crews worked for six weeks in 1989, three weeks in 1990 and two weeks in 1991. The site contained evidence of sporadic use as a hunting camp from about 4,000 years ago well into the Fremont era. The lowest cultural level contained two basin-shaped house floors-the earliest remains of domestic structures yet found in Utah.

Archaeological Evidence of Prehistoric Fishing at Utah Lake

Rick J. Hunter

Utah Lake in the eastern Great Basin, has long been known as a major fishery that was important to prehistoric peoples. However, we have little in the way of prehistoric fishing gear to support this statement. This is surprising, especially when compared with western (Lahontan) Basin fisheries such as Pyramid and Winnemucca lakes, where archaeologists have documented an abundance of prehistoric fishing equipment (cf. Tuohy 1990). Utah Lake, however, has only recently become the focus of researchers studying various wetland subsistence strategies. The principal objective of this paper is to serve as an introduction to ongoing research geared toward understanding the fishing technologies employed at Utah Lake in the prehistoric past and to present examples of early fishing gear recently recovered from lake edge sites.

Experiments on Artifact Displacement in Canyonlands National Park*

Ralph J. Hartley

The present study reports an empirical investigation of artifact behavior in Canyonlands National Park in southeastern Utah. The park lies within the Canyonlands physiographic division of the Colorado Plateau, formed by the drainage system of the Colorado and Green rivers (see Hunt 1974; Stokes 1977). The area is characterized as having a cold, middle-latitude, semi-arid climate. Most of the soil is shallow, dry and without distinct horizons. Many areas have less than 20 inches to bedrock although some areas are deeper. Eolian deposits cover several areas in this region. Eight different microenvironments that vary in geomorphological position, but which are influenced by similar climatological factors were chosen for experiments on the displacement of lithic materials. These field experiments took place in the Island-in-the-Sky district of the park. This mesa north of the confluence of the Colorado and Green rivers lies at an elevation of 1,500-1,800 m.

Further Experiments in Native Food Procurement

Kevin T. Jones and David B. Madsen

Over the last decade, a number of experimental studies on the costs and benefits of collecting and processing a variety of native food resources have been conducted in the Great Basin and adjoining areas (e.g., Fowler and Walter 1985; Jones 1981; Larralde and Chandler 1980; Madsen and Kirkman 1988; Simms 1984). The goal of most of these is to collect data on resource return rates-the amount of edible food or energy that could be obtained in a given amount of time. These values are expressed as a ratio, such as calories per hour. Return rates for

different resources can be compared and ranked, giving insight into the energetic efficiency with which various resources can be harvested. Most of this work is guided by foraging theory and related models (see Charnov and Orians 1973; Pyke et al. 1977; Simms 1987; Smith 1983; Stephens and Krebs 1986). Experimental return rates are now available for 30 collected resources from the Great Basin, and estimated return rates for a variety of hunted resources have also been produced (Simms 1984). Many of these rates are based on a single, or few experiments of limited duration and in a limited array of circumstances. We know, however, that a range of variation in the productivity, nutritional content, ease of harvesting, individual gathering and processing ability, and other factors is present (e.g., Madsen and Kirkman 1988). This variation is to be expected, and is an important facet of data to be considered when using return rate in modeling subsistence. We encourage additional experimentation on native resources, including resources for which information is currently unavailable. In the following sections we present some information relevant to understanding the range of variation in some Great Basin resources. We report on experimental gathering of the Mormon Cricket (*Anabrus simplex*), and present the results of additional experiments on cattail (*Typha latifolia*) rhizomes and Indian Ricegrass (*Oryzopsis hymenoides*) seeds.

NOTES

Fluted Projectile Points in Southwestern Utah*

Robert B. Kohl

Copeland and Fike (1988) published their comprehensive paper, *Report on Fluted Points in Utah*, in *UTAH ARCHAEOLOGY* 1988. Their research of published and unpublished reports and interviews with professional archaeologists and some private collectors identified 43 Clovis and Folsom projectile points in the state. Only two Clovis and three Folsom points were recorded in southwestern Utah, most of them in Bureau of Land Management files and few in private collections. The Jennifer Jack-Dixie Chapter of the Utah Statewide Archaeological Society initiated a project to seek out privately-held Paleo points within an approximate 65-mile radius of St. George. A grant was awarded to the chapter by the Utah Division of State History for the project with 50 percent or more of the grant amount to be matched by local cash outlay. With the exception of hourly rate paid for the drawings, all other time was voluntary.

Some Calibrated Radiocarbon Dates from Utah County, Utah*

Donald W. Forsyth

Over the last 45 years archaeologists at Brigham Young University have sporadically undertaken a number of excavations on the east side of Utah Lake in the region near the modern airport and in the southern portion of Utah Valley near Goshen, Utah. The results of these excavations have only been partially reported, primarily in master's theses (Christensen 1947; Green 1961; Mock 1971; Richens 1983); however a few preliminary reports or articles (Green 1964; Forsyth 1984; 1986) have also been published. However, since there were few chronometric dates for these sites, I decided to take a number of the samples and send them to Beta Analytic Inc. for assay in order to try to establish a chronological framework for the sties on the basis of something other than cross-dating with other Fremont sites. The sites for which dates were obtained are 42Ut110 and 42 Ut111 (two of the Hinckley Mounds) 42Ut102 (Woodard Mound), 42Ut150 (Smoking Pipe), Spotten Cave (42Ut104), and 42Ut271 (Seamons Mound). The results of the C14 analyses are given in Table 1.

Antiquities Section, Division of State History, List of Reports with 1991 Project Numbers

Kevin T. Jones

All archaeological organizations holding an antiquities permit issued by the Antiquities Section and who carry out archaeological projects in the state are obliged to: (1) obtain a project number from the Antiquities Section and (2) submit a report on the work done. The following is a list of reports received by the Antiquities Section, Division of State History, for projects with 1991 available to researchers holding a current Utah Antiquities Annual Permit.

REVIEWS

Wetland Adaptations in the Great Basin, edited by Joel C. Janetski and David B. Madsen, reviewed by Mark E. Stuart

The Student's Guide to Archaeological Illustrating, reviewed by Robert B. Kohl

Indian Givers, reviewed by Robert B. Kohl

1992

ARTICLES

The Lobed-Circle Image in the Basketmaker Petroglyphs of Southeastern Utah

Steven James Manning

In the Anasazi Basketmaker area of southeastern Utah there exists a distinctive, enigmatic, petroglyphic image that has often been discussed, but not identified. The image consists of a round-to-oval shape from which there is a rounded-rectangular extension or lobe. The shape exists both in the rock art and in physical objects. A method for determining theoretical interpretation for rock art images is proposed and then applied to arrive at a meaning for the image. The image occurs in a variety of contexts that suggest the image is associated with fertility. It is proposed that the image is a representation of a uterus. Further, Southwestern architecture has an overall form nearly identical to the lobed-circle image. This suggests the existence of ideological ties between the shape of these structures and the uterine image. The analysis also suggests that many rock art panels are mythological in nature.

Finding A Date: Some Thoughts on Radiocarbon Dating and the Baker Fremont Site in Eastern Nevada

James D. Wilde

Conventional radiocarbon dating is a standard procedure in archaeology. It is a straightforward technique of counting radioactive particle emissions from the nucleus of unstable carbon isotopes and using the average number of emissions to calculate time elapsed since an organism died. Its use in archaeological contexts requires much care and thought because many factors of contamination, old wood, fractionation, and context can skew the results. In addition, its statistical nature keeps it less precise than most archaeologists would like. I explore the nature of conventional radiocarbon age assessment and ways of making it more precise by analyzing ten C14 age assays from a Fremont structural site near Baker, Nevada. The suite of ages suggests that the site was occupied in the late twelfth and early thirteenth centuries. High quality corn ages, however, suggest that its major occupation occurred during the thirteenth century, and that it was probably used into the fourteenth century.

The Fremont: A View from Southwest Wyoming

Craig S. Smith

Examining the archaeological record at the boundary between traditional archaeological cultures, especially those of different subsistence adaptations, can provide new insights concerning cultural behavior. Archaeological excavations at 48Ut199 and 48Sw97 have provided an opportunity to examine the relationship between the partly horticultural Fremont of the northern Colorado Plateau and eastern Great Basin, and the hunters and gatherers of southwest Wyoming during the Late Prehistoric period (1,500-650 B.P.). Investigations at these and other sites in southwest Wyoming have yielded apparent Fremont pottery together with the remains of typical southwest Wyoming hunter and gatherer campsites. These sites may represent camps of hunters and gatherers coming into the southwest Wyoming area from the south and west to obtain food, especially bison. The information from southwest Wyoming provides additional evidence concerning the diversity of the Fremont and suggests that fairly mobile hunting and gathering was included among the wide range of adaptive strategies followed by the Fremont.

REPORTS

Late Basketmaker Archaeology on the Middle Virgin River, Washington County, Utah*

Shane A. Baker and Lorna Beth Billat

During the early part of 1987, the Office of Public Archaeology (OPA) at Brigham Young University (BYU) completed a data recovery program at five archaeological sites along the Virgin River in Washington County, Utah. The project area lies in the heart of the Virgin Anasazi Culture area, a region that can still be characterized as poorly understood. The work completed by BYU on the State Route 9 (SR-9) Project contributed crucial data at a time when a number of significant projects were coming to completion in the region. This surge of research included several projects completed during the late 1970s and early 1980s, which together constitute the first substantial investigation of Virgin Anasazi riverine sites to be conducted since the 1960s. These include investigations at the Red Cliffs Site (Dalley and McFadden 1985), Greensprings (Westfall et al. 1987), the Little Man Sites (Dalley and McFadden 1988), and a number of sites in the Quail Creek Reservoir project area (Walling et al. 1986). The SR9 Project sites add an important piece to this growing picture of prehistoric adaptations in the St. George Basin and surrounding area.

Archaeological Sites around a Dry Lake in Southwestern Utah

Roy Macpherson

Archaeological sites dating to the late Paleo-Indian or early Archaic period have been recorded in numerous locations in the Great Basin in association with ancient playa or dry lake features (Aikens and Madsen 1986; Copeland and Fike 1988). Interest in sites of this age led to the investigation of a southern portion of Tule Valley in southwest central Utah because of its geographical similarity to pre-Archaic sites in eastern Nevada (Willig and Aikens 1988; Beck and Jones 1988; Hutchinson 1988; Price and Johnston 1988) and its proximity to the well-studied, pre-Archaic site 42Md300 (Simms and Lindsay 1989) in the lower Sevier Valley. This specific area was surveyed because the U.S. Geological Survey maps indicated a small depression or dry lake bed at an elevation of 5,180 ft, which is above the highest level of Lake Bonneville (Currey et al. 1984). Although the dry lake associated sites reported here cannot be specifically classified as pre-Archaic because of lack of diagnostic artifacts or datable materials, the sites have useful archaeological information.

Deformity and Left Hip Fusion in a Prehistoric Great Basin Skeleton

Carol J. Loveland, Denise Furlong, and John B. Gregg

Medical doctors writing in the nineteenth century documented many cases of a condition that frequently caused hip joint destruction and the fusion (ankylosis) of the patient's hip and femur. In these reports inflammatory hip joint disease, with or without fusion, was usually ascribed to trauma, a birth defect, pus forming bacterial infection, or tuberculosis (Bryant 1873; Dorsey 1813; Erichsen 1878; Gibson 1827; Good 1829; Keen and White 1893; Kellogg 1905). Senior orthopedists (Robert VanDemark, personal communication 1990) and surgeons (Howard Shreves, personal communication 1990), who practiced during the pre- and early antibiotic era, describe the severe pain experienced by individuals affected by inflammatory hip disease. Affected individuals often drastically modified their posture in an attempt to alleviate their pain, and, in the process, many have induced permanent skeletal deformity. Despite the frequent mention of hip deformity and fusion in early medical literature, surprisingly few cases are described in paleopathology literature, and only one other case has been reported from the New World (Bennike 1985; Bennike et al. 1986; Bennike and Bro-Rasmussen 1989; Janssens 1989; Jarcho et al. 1963; Ortner and Putschar 1981). This paper reports the first instance of spontaneous extensive hip joint destruction and bony fusion (ankylosis) in a pre-Columbian skeleton from the Great Basin.

Salvage Excavations at the Burch Creek Site 42WB76 Weber County, Utah

Mark E. Stuart

In March of 1988, members of the Promontory-Tubaduka Chapter of the Utah Statewide Archaeological Society (USAS) tested an open sand dune site on private land in South Ogden City, Weber County, Utah. The project conducted under the direction of Dr. Steve Simms and Ms. Pam Higgins of Weber State University, focused on areas of the site being destroyed by construction activities. Earlier survey work by chapter member Mark Stuart, noted both Fremont and Late Prehistoric artifacts. A Pinto point and a Humboldt point hinted that the site may contain Archaic materials as well. A preliminary report of these excavations has been published in the UPAC Newsletter (Stuart 1988) and a final site report published by the Promontory-Tubaduka Chapter of USAS (Stuart et al. 1992) is on file with the Division of State History, Antiquities Section, Salt Lake City.

NOTES

Human Scalps from Eastern Utah

Julie Howard and Joel C. Janetski

Over the past several years the Bureau of Land Management (BLM) in Moab and the Museum of Peoples and Cultures at Brigham Young University (BYU) have obtained collections of prehistoric materials that include human scalps. These items have come from both the Uinta Basin and the Moab area of eastern Utah. Similarities in the scalps and associated material cultural suggest regional affinities, perhaps with the Southwest. The function of these important but highly sensitive artifacts is unknown at the moment, although intriguing insights are available in the ethnographic literature on the Pueblos.

An Atlatl from Snow Canyon State Park

David B. Madsen

In early January 1985, hikers discovered the partial remains of a human burial and an associated wooden artifact in a lava tube in Snow Canyon, Washington County, Utah. The burial was sent to the Office of the Medical Examiner for analysis and the artifact was forwarded to the Antiquities Section for examination. Since the artifact is a

virtually complete atlatl and the number of atlatls from Utah are rather rare, I here report the limited amount of descriptive information available from these analyses.

An Unprovenienced Split-Twig Figurine from Cowboy Cave*

Nancy J. Coulam

This note describes a split-twig, animal figurine found eroding from the back dirt of Cowboy Cave by patrolling National Park Service Maze District rangers. Split-twig figurines are constructed of a single, long, thin twig or branch that is split down the middle, bent, and folded to create a miniature animal. They were first discovered in the Grand Canyon, where they were believed to be associated with Early Archaic Pinto points, but analysis of Cowboy Cave demonstrated that, at least in the Green River region, split-twig figurines are associated with Gypsum points and the Late Archaic (Schroedl 1976, 1977).

The Broadbent Cache Site

Lora Broadbent

On September 2, 1989, Arden and Lora Broadbent were camped in the Ashley National Forest west of Flaming Gorge Reservoir in an unnamed valley by some perennial springs. Nearby was a long ridge of sandstone outcroppings. During the course of observing deer habitat, the Broadbents discovered an unusual cache of 35 large, side-notched, stemmed projectile points hidden in crannies in a small rockshelter in the outcroppings. The purpose of this paper is to document this rare and unusual cache of projectile points.

Harpoons from Utah Lake

Ron Martin and Joel C. Janetski

Information about prehistoric fishing gear has been relatively scarce for the eastern Great Basin including Utah Valley where fishing has been described as an important activity (Janetski 1990, however, see Hunter 1991). This paper describes several bone harpoons that have been collected from archaeological sites in Utah Valley by members of the Utah County Chapter of the Utah Statewide Archaeological Society. The following section briefly describes each of the sites where the artifacts were collected as well as the harpoons from those sites.

An Obsidian Cache from the Great Salt Lake Wetlands, Weber County, Utah

Ann Cornell, Mark E. Stuart, and Steven R. Simms

A cache of 88 primary and secondary obsidian flakes was excavated from a small subsurface pit at a Late Prehistoric site near the edge of the Great Salt Lake north west of Ogden, Utah. The site was discovered by the two lead authors and excavated by them during investigations sponsored by Utah State University. Here we describe the site context, excavation findings, lab analysis, and chemical sourcing of the obsidian. Information on similar caches is also provided, and the implications for interpreting past life in the Great Salt Lake marshes are briefly discussed.

Antiquities Section, Utah Division of State History, List of Reports with 1992 Project Numbers

Evelyn Seelinger and Kevin T. Jones

All organizations who conduct archaeological projects in the state are obliged to: (1) obtain a project number from the Antiquities Section, Division of State History and (2) submit a report on the work done. The following is a list of reports received by the Antiquities Section, for projects with 1992 project numbers. These reports are on file, and are available to qualified researchers.

REVIEWS

Slide Showmanship, reviewed by Robert B. Kohl

Encyclopedia of Native American Tribes, reviewed by Robert B. Kohl

1993

ARTICLES

The Past as Commodity: Consultation and the Great Salt Lake Skeletons

Steven R. Simms

Flooding of the Great Salt Lake exposed dozens of human remains beginning in 1987. A consultation process commenced to assess ownership, plan action, discuss scientific analyses, and seek state legislation for repatriation. This case study finds: consultation has no end, merely punctuations of decision; claimants to the past are myriad and dynamic; avocational and professional archaeologists must not be alienated from the process because without them more, not fewer Native American skeletons will be destroyed; relative to preservation, less value is placed on learning about the past, despite the fact that preservation has value only in light of potential knowledge to be gained; the most exciting analyses are those requiring modification of bone, and the most far-sighted stance is to stand up firmly for scientific study; burial vaults offer the best solution for curation, but unless costs are controlled, politicians will be unwilling to fund them.

What can Great Basin Archaeologists Learn from the study of Site Structure? An Ethnoarchaeological Perspective

James F. O'Connell

Prehistoric site structure is commonly seen as a promising source of information about past human behavior. Ethnoarchaeological studies indicate that research on site structure may require costly adjustments in conventional approaches to data recovery, with no commensurate increase in real knowledge except under narrowly defined circumstances, none of which are common in the Great Basin. Nevertheless, it should still be pursued whenever possible, partly to assess the validity of predictions based on ethnoarchaeological analogies, partly (and probably more importantly) as a means of controlling differences in assemblage composition related to the widespread practice of size sorting in secondary refuse disposal.

REPORTS

Estimating Load Size in the Great Basin: Data from Conical Burden Baskets*

K. Renee Barlow, Penny R. Henriksen, and Duncan Metcalfe

Archaeologists working in the Great Basin have recently begun to investigate the costs and benefits associated with transporting plant resources and the probable effects of these costs and benefits on plant procurement strategies. Jones and Madsen (1989) predicted maximum expected transport distances for a variety of Great Basin resources, Zeanah (1992) evaluated the effects of transport costs on the optimal location of residential camps, and Barlow and Metcalfe (1995; Barlow 1990; see also Metcalfe and Barlow 1992) suggested that transport distance should determine the types and quantities of plant parts returned to camp by central place foragers. A critical assumption common to these models is that an individual's success (calories per hour) in collecting resources and transporting them back to a base camp is constrained by the amount of resource that can be carried in a single load (Metcalfe and Barlow 1992; Orians and Pearson 1979). For food resources, the energetic benefit of a load is simply the amount of edible resource or calories in the transported load. Two variables

determine this quantity: (1) the caloric value of the resource load per unit weight or volume, and (2) the weight or volume of a load of the resource. The caloric value of plant food per unit weight or volume varies between resources, and also with the proportions and caloric values of the different plant parts in the resource load. Elsewhere two of us (Metcalfe and Barlow 1992) have suggested the circumstances in which foragers are expected to increase the caloric value of the transported load by field processing, or removing parts of relatively low utility at the resource patch. The other variable that determines the benefit gained by returning a load of resource to a central place is load size.

Why Should it Matter if I take another Potsherd? The Impacts of Contemporary Artifact Collecting at Anasazi Villages

William B. Fawcett

During a recent survey of the Muddy Creek Orderville area in Kane County, Utah, a team from Utah State University encountered 20 Anasazi villages on which thousands of undecorated potsherds lay on the surface, but only a handful, if any, decorated sherds remained. We suspected that years of artifact collecting had stripped these sites of the decorated potsherds. This article examines a statistical method for estimating the impacts of collecting the decorated sherds from archaeological sites. First I examine the statistical relationship of decorated to undecorated potsherds at an excavated sample of Virgin Anasazi villages. The derived regression formula then is used to estimate the number of decorated sherds that once existed on the surface of 20 villages in the Muddy Creek-Orderville area. The accuracy of these estimates is supported by introducing other predictors of vandalism, developed in studies with more visible vandalism and interviews with collectors. I conclude with a discussion of ways to incorporate these findings into regional studies, directing the results in a positive fashion beyond another cautionary tale.

Fremont Corn Agriculture: A Pilot Stable Carbon Isotope Study

Joan Brenner Coltrain

Great Basin archaeologists have long debated the role of corn agriculture in Fremont subsistence. Standard approaches to dietary reconstruction, including plant macrofossil and pollen analyses, have proven inconclusive. Here I report the results of a recent stable carbon isotope study designed to address this issue. Results suggest that corn may have been an important component of Fremont diet in certain contexts.

Investigating the Spatial Structure of Lithic Scatter Sites from an Ethnoarchaeological Perspective: Examples from Utah and Nevada*

Betsy L. Tipps

Information derived from ethnoarchaeological studies of modern hunter-gatherer site structure can improve interpretations of shallow, open lithic scatters by helping us predict the types and locations of features, facilities, and refuse deposits that might be present on a site, select field methods that will adequately uncover extant site structure patterns, and better understand the function, duration of occupation, and occupational history of some lithic scatters. Data from one site in northern Nevada and one site in eastern Utah are used as examples of how information derived from ethnoarchaeological studies of hunter-gatherer site structure can improve archaeological site interpretations.

Salvage Excavations at the Fire Guard Hearth 42WB54 Weber County, Utah

Mark E. Stuart

The purpose of this paper is to document the results of salvage excavations at the Fire Guard Hearth, 42Wb54 Weber County, Utah and report one of the first C14 dates from an upland site east of the

Great Salt Lake. Excavation of this feature was undertaken by the Promontory/Tubaduka Chapter of the Utah Statewide Archaeological Society as part of their ongoing research into the archaeology of the Great Salt Lake region of Northern Utah. The project was under the direction of Dr. Bill Fawcett of Utah State University with Mark Stuart serving as field supervisor. Chapter members who participated were Gary and Carl DeMastrie, Bill and Sara Yates, Steve Hansen, Ann Cornell, Jason Jones, Lisa Pringle, Richard James, and Sarah Halverson. They donated a total of 45 hours in the completion of this project. Their labor of love is greatly appreciated.

Running Antelope: A Paleoindian Site in Northern Utah

Dann J. Russell

The Western-Stemmed Tradition of lanceolate projectile points is represented by a variety of styles. One style of this tradition is called a Haskett. The purpose of this report is to present information on a recently discovered Paleoindian site containing this style of the Western-Stemmed Tradition, next to present information on Haskett points and site locations where they have been found, and then to speculate on the value and relationship of this new site to these other Haskett sites.

Some Enigmatic Stations of the Pony Express and Overland Stage between Salt Lake City and Nevada

David M. Jabusch and Susan C. Jabusch

Since its inception in 1860, the Pony Express has been an important part of the opening of the west to the American public. However, prior to the 1970s, there was little serious scholarly work on it. In conjunction with the nation's bicentennial, several serious studies were conducted in the 1970s, including Bluth (1978), Fike and Headley (1979) and Berge (1980).

NOTES

Cultural Affiliation and Age of the Broadbent Cache Site

Alan R. Schroedl

In a recent Utah Archaeology, Broadbent (1992) describes a cache site in Daggett County, Utah, that contained 39 projectile points and 1 biface. These artifacts were apparently stored as a cache in one of the cracks in a large rock outcrop in a rockshelter in a high mountain valley near Sheep Creek at about 8,280 ft. The artifacts were analyzed and measured by James C. Wood and Gene Titmus who apparently did not offer any typological identification. Broadbent suggests that these points might be typeable as the Sand Dune Side-notched type (Geib and Ambler 1991; Tipps and Hewitt 1989). Although there are some superficial similarities between the Broadbent cache points and the Sand Dune Side-notched points, the points from the cache are not morphologically similar to Sand Dune Side-notched points. The Sand Dune Side-notched point, an Early Archaic point type, is generally narrower, smaller, and more symmetrical, and appears to be geographically restricted to the highly dissected Canyonlands section of the Colorado Plateau in southern Utah and northern Arizona (Betsy L. Tipps, personal communication 1993). Morphologically, the projectile points pictured by Broadbent (1992:Figure 4) are best classified as Mount Albion Corner-notched points, the defining point type for the Mount Albion Complex centered in the southern Rocky Mountains province (Benedict1978a).

REVIEWS

Games of the North American Indians Volume 1: Games of Chance, and *Games of the North American Indians Volume 2: Games of Skill*, reviewed by Robert B. Kohl

Of Blood and Stone: Investigations into Southeastern Utah Archaic, reviewed by Robert B. Kohl

The Sagebrush Ocean: A Natural History of the Great Basin, reviewed by David M. Jabusch

Northern Anasazi Ceramic Style: A Field Guide for Identification, reviewed by Mark Bond

The Main Ridge Community at Lost City: Virgin Anasazi Architecture, Ceramics, and Burials, reviewed by Douglas A. McFadden

Quest for the Origins of the First Americans, reviewed by Roy McPherson

The Desert's Past: A Natural Prehistory of the Great Basin, reviewed by Dave N. Schmitt

1994

ARTICLES AND REPORTS

Cowboy Cave Revisited

Alan R. Schroedl and Nancy J. Coulam

Cowboy Cave, a stratified Archaic cave site in southeastern Utah, has been a cornerstone in defining the Archaic occupational chronology of the Colorado Plateau. A review of the radiocarbon dates in relation to published artifact descriptions and unpublished feature data allow for a clarification of the site stratigraphy and sequence of occupation. Prehistoric occupation in Cowboy Cave was restricted to three periods, the Early Archaic, the Late Archaic, and the Terminal Archaic, each with a constellation of diagnostic artifacts. Although the site functioned primarily as a spring/summer seed processing locale, for a short period during the Early Archaic, it also functioned as a winter base camp. Some general observations about cave site excavations on the Colorado Plateau are also presented.

From Here To Antiquity: Holocene Human Occupation on Camels Back Ridge, Tooele County, Utah

Dave N. Schmitt, Monson, W. Shaver III, and Jeffrey M. Hunt

The results of limited archaeological investigations at an open lithic scatter and neighboring cave on Camels Back Ridge are presented. The location of nearby remnant features of Pleistocene Lake Bonneville suggests that Camels Back Ridge was accessible during the latter part of the post-Provo regression approximately 13,000 B.P. Basalt artifacts recovered from the lithic scatter may signal a Paleoindian occupation, and artifact types and radiocarbon analyses indicate that the cave was occupied periodically from ca. 7,500 B.P. through the Fremont Period. Given their setting, antiquity, and the presence of occupation surfaces in the cave, the sites offer a unique opportunity to investigate the types and distribution of artifacts and ecofacts spanning 7,500 years of intermittent occupation in an uncharitable desert environment.

Fremont Settlement and Subsistence Practices in Skull Valley, Northern Utah

Shelley J. Smith

Excavations were conducted at 42T0504, a small site in Skull Valley, northern Utah, which dates to the Early/Mid Fremont time period. Situated on a long dune-like feature, the site contains evidence of an ephemeral brush structure, shallow pits, and a suite of nested clay-lined pits. Fremont pottery, corn, ground and flaked lithics, fire altered rock, and daub fragments were recovered. The site is interpreted to be a locus for late-summer/early fall seed gathering by small mobile groups of people who had access to corn, either through trade or part-time horticulture. The environment, probably locally moister than today, resulted in perennial water in the playa adjacent to the site. 42T0504 represents another example of Fremont subsistence and settlement diversity.

Archaeological Salvage Investigations at a Fremont Site in the Jordan River Delta

Dave N. Schmitt, Steven R. Simms, and Gabrielle P. Woodbury

Salvage excavations at site 42SL197 in west Salt Lake City retrieved stone tools, butchered bison bone, ceramics, and human skeletal remains. Although the deposits had been disturbed by recent construction activities, recovered artifacts and ecofacts, and human bone analyses provide some useful information on human subsistence and settlement. Radiocarbon analyses of human bone collagen indicate that the site witnessed at least two occupations during the Fremont Period, and stable carbon isotope studies suggest that domesticates comprised a portion of the diet. Site content and context suggest that 42SL197 represents a farming base or habitation site tied to a larger horticultural complex.

Probable Metastatic Carcinoma in a Prehistoric Great Basin Skeleton

Carol J. Loveland and John B. Gregg

A 30–35 year old female recovered in 1990 from site 42WB48, Weber County, Utah, was carbon-dated at 1020±70 B.P. Major portions of the skeleton proximal to the elbows and knees exhibited destructive lesions suggestive of metastatic carcinoma (cancer). Likely sources of the primary tumor are discussed. This remarkable anomaly, rare in ancient populations, establishes the possible presence of certain diseases in the prehistoric Great Basin.

A Biface Cache from 42BO796 in Northwestern Utah

Roy Macpherson

A cache of ten complete and three fragmentary chert bifaces was found during a BLM archaeological survey in northwestern Utah. The ellipsoidal-shaped bifaces were knapped from white to gray chert and had a mean size of 10.3 cm by 5.8 cm by 1.6 cm thick. The bifaces were found within a larger site, 42B0796. This paper reports details on the bifaces including site location and setting, archaeology of the area, cache description and characteristics, a comparison of this cache to others, and some interpretive comments.

NOTES

Aspects of the Virgin Anasazi Tradition in the Grand Canyon

Robert C. Euler

When viewed from Grand Canyon on the southern boundary of the Virgin Tradition, there appear to have been slight differences between them and those of the Kayenta Tradition between A.D. 1100–1150. While architectural differences are notable, ceramic variations are not always easy to discern. This paper suggests that sites of the Virgin Tradition are not generally found east of Kanab Canyon, but attempts to establish fixed boundaries are not intellectually productive.

The Pectol/Lee Collection, Capitol Reef National Park, Utah

Lee Ann Kreutzer

Recovered by local collectors in the early decades of this century, the archeological museum holdings of Capitol Reef National Park are mostly without provenience or other documentation. Nevertheless, they are a significant resource that may be useful to researchers studying the Fremont and later occupations. The complex story of the artifacts' history, their local, family, and Mormon religious significance, of NAGPRA compliance issues, and of the likely loss of the entire collection from public domain raises a number of issues pertinent to archeology, social history, and museum studies alike. Collection history and a small part of the collection are described here.

The Prehistoric Baskets from the Leo C. Thorne Collection, Part 1

C. Lawrence DeVed and Rhoda Thorne DeVed

The following descriptions and accompanying photographs of baskets from the Leo Thorne collection by C. Lawrence and Rhoda Thorne DeVed are an important contribution to knowledge of basketry from in and around the Uinta Basin. Archaeologists have known about the collection for some time and have been anxious to learn more about the extraordinarily diverse basketry.

REVIEWS

After the Ice Age: The Return of Life to Glaciated North America, reviewed by Robert B. Kohl

The Mythology of North America, reviewed by Robert B. Kohl

Native American Myths and Legends, reviewed by Robert B. Kohl

Creations Journey—Native American Identity and Belief, reviewed by Robert B. Kohl

In the Shadow of Fox Peak; an Ethnography of the Cattail-Eater Northern Paiute, review by Robert G. Elston.

1995

ARTICLES AND REPORTS

The Keystone Azurite Mine in Southeastern Utah

Nancy Coulam and Alan R. Schroedl

Over the past 25 years human skeletal remains have been sporadically discovered at the Keystone Azurite Mine in southeastern Utah. These finds have been cited in the popular literature as being 100 million year old human remains. However, an inspection of the mine, a review of the field notes, and interviews with participants, coupled with a review of prehistoric mining in the Greater Southwest, indicate that these finds are the remains of ancestral Puebloan miners dating to about the 6th or 7th century A.D.

The Rabbit Drive Throughout Time: Analysis of the North American Ethnographic and Prehistoric Evidence

Brian S. Shaffer and Karen M. Gardner

For Native American Indians living in desolate areas of the Great Basin and the Southwest, the rabbit drive was an important method for obtaining leporid (jackrabbit and cottontail) resources. Archaeologists infer that the rabbit drive was in use prehistorically, based primarily on ethnographic analogy and the recovery of game nets thought to be used in rabbit drives. No definitive archaeological rabbit drive sites have been identified, however, and most game nets were only recovered from storage contexts. Additional prehistoric rabbit drive data comes from an eleventh century Classic Mimbres Style III bowl from New Mexico. The bowl's motif clearly depicts a rabbit drive in progress. Comparison of the archaeological and ethnographic evidence indicates that rabbit drives were practiced over both a wide geographic area and long period of time using the same technology and basic group tactics as were recorded historically.

Site 42SA22396: A Prehistoric Hoe Procurment Site on Big Bench, Southern San Juan County, Utah

William E. Davis and Keith R. Montgomery

Investigations have been conducted on the lithic technology and geological chemical composition and distribution of a particular artifact assemblage located on Big Bench, southern San Juan County, Utah. Current research at Site 42Sa22396

demonstrates that a tuffaceous silty claystone with accretionary lapilli, occurring in the Jurassic Morrison Formation, was the preferred production material for a specialized type of prehistoric hoe.

NOTES

The Prehistoric Baskets from The Leo C. Thorne Collection, Part 2

C. Lawrence DeVed and Rhoda Thorne DeVed

Editor's Note: The following descriptions and accompanying photographs of baskets from the Leo Thorne collection by C. Lawrence and Rhoda Thorne DeVed are an important contribution to knowledge of basketry from in and around the Uinta Basin. Archaeologists have known about the collection for some time and have been anxious to learn more about the extraordinarily diverse basketry. Part 1 of the article is published in the 1994 issue of Utah Archaeology.

Antiquities Section, Utah Division of State History, List of Reports with 1995 Project Numbers

Evelyn Seelinger

All organizations who conduct archaeological projects in the state are obliged to: (1) obtain a project number form the Antiquities Section, Division of State History and (2) submit a report on the work done. The following is a list of reports received by the Antiquities Section, for projects with 1995 project numbers. These reports are on file, and are available to qualified researchers.

REVIEWS

Across the West: Human Population Movement and the Expansion of the Numa, reviewed by Robert L. Kelly

Accidental Archaeologist, reviewed by William B. Fawcett, Jr.

Holocene Archaeology Near Squaw Butte, Canyonlands National Park, Utah, reviewed by Owen Severance

1996

ARTICLES AND REPORTS

Virgin Anasazi Settlement and Adaptation on the Grand Staircase

Douglas A. McFadden

The Virgin Anasazi, although generally considered to be a single cultural entity, occupied a number of discrete geographical areas in southern Utah, northern Arizona and southern Nevada. One of the more varied and distinctive was the Grand Staircase section of the Colorado Plateau (Stokes 1977). Settlement data, based on recent intensive inventories, is presented and analyzed in terms of local adaptation to the Grand Staircase environment. High densities of architectural sites are located in a variety of different arable settings between 5,000 ft and 7,000 ft (1524 m to 2134 m) - the zone of prehistoric agriculture. These site clusters are interpreted to be dispersed communities that were occupied, probably discontinuously, from the early Basketmaker period into Pueblo III times. On the level of the individual site, Virgin architectural layouts and internal structure reflect a tendency to be complex and long lived; they were however, frequently abandoned and reoccupied. Rather than separate and unrelated occupations, these episodes are demonstrated to be part of the Virgin settlement pattern. It is suggested that this unique "Virgin pattern" reflects a specialized adaptation to the Grand Staircase. A model of residential mobility is proposed as a formal strategy that permitted shifting between multiple agricultural locales in response to climate change.

AMS Dating of Plain-Weave Sandals from the Central Colorado Plateau

Phil R. Geib

AMS radiocarbon dates on plain-weave sandals from caves of the central Colorado Plateau are reported. The sandals range in age from about 6900 to 3200 B.P. (ca. 5700-1450 cal. B.C.). The findings strengthen a case for both population and cultural continuity during the Archaic period, and support a related argument that middle Archaic breaks in the occupancy of several important shelters such as Cowboy Cave resulted from settlement pattern change and not regional abandonment. The dates demonstrate that living accumulations within some shelters of lower Glen Canyon resulted from Archaic foragers and not Puebloan farmers as previously claimed. Benchmark Cave, in particular, emerges as a site with an important record of hunter-gatherer occupancy during the middle and late Archaic.

The Hell'n Moriah Clovis Site

William E. Davis, Dorothy Sack, and Nancy Shearin

Site 42MD1067 is a single component Clovis site which represents a retooling station where projectile points were manufactured, and broken projectile points were replaced or resharpened. The site is located at what for a time was the southern margin of the regressive lake in Tule Valley near the end of and shortly after the Bonneville lake cycle. Geomorphic and stratigraphic evidence indicate that the most environmentally attractive period in prehistory for human exploitation in the general site area was between 13,950 and 10,000 yr B.P. During this period, resources associated with Lake Tule and with adjacent wetland/marsh environments would have been within close proximity to the site.

NOTES

Some Prehistoric Holes along Cliff and Cub Creeks, and at Dead Horse Spring, Uintah County, Utah*

C. Lawrence DeVed and Rhoda Thorne DeVed

In north eastern Utah there are few sites, except the numerous rock art panels, where a person can go and see something in place that the prehistoric peoples made and used. These "Indian holes" are such a feature, and we shall describe a few of them so that interested persons may try to located them. No attempt is being made to locate all of the sites in even the limited area discussed. For this report we discuss two types of sites with holes that can be identified—those called pattern sites—where clusters of holes seem to form a pattern that may have meaning, and individual holes that, though not always solitary, do not seem to have any sort of meaningful pattern.

Antiquities Section, Utah Division of State History, List of Reports with 1996 Project Numbers Assigned

Evelyn Seelinger

All organizations who conduct archaeological projects in the states are obliged to: (1) obtain a project number from the Antiquities Section, Division of State History and (2) submit a report on the work done. The following is a list of project numbers assigned by the Antiquities Section for projects with 1996 project numbers.

REVIEWS

Adventures in Stone Artifacts: A Family Guide to Arrowheads and Other Artifacts, reviewed by Ronald J. Rood

Steinaker Gap: An Early Fremont Farmstead, reviewed by Ronald J. Rood

1997

ARTICLES AND REPORTS

Winter Cattail Collecting Experiments

David B. Madsen, Lee Eschler, and Trevor Eschler

Cattail (*Typha latifolia*) rhizomes and shoots were experimentally collected and processed during late winter (January through mid-March) to examine their utility as winter food resource. Shoots are readily collected from warm water springs, but are generally inaccessible where marshes are frozen. They produce return rates of 500-600 Cals/hr., but are bulky and were most likely used as a dietary supplement. Cattail rhizomes were easily collected in fields by using a digging stick to pry off 6-12 inches of frozen soil above the rhizomes. The starch content of the rhizomes is at its highest from late fall until early spring when it begins to support new growth. Processing which employs simple mashing and boiling techniques produces return rates of 3000-4000 Cals/hr. When combined with other experimental data, the return rate range for cattail rhizomes is 200-5000 Cals/hr. Increasing experimental data indicate wide return rate ranges are a common characteristic of many food resources, suggesting the need for caution in applying diet breadth models in archaeological situations.

The Escalante Game Drive Site

Alan D. Reed

The Escalante Game Drive site (5DT192) is along the Gunnison River valley in west-central Colorado. Investigations at the site by the Chipeta Chapter of the Colorado Archaeological Society have documented at least 27 cultural features thought to represent components of a game drive system, as well as a broad scatter of stone and Euroamerican artifacts. Chipeta Chapter members conducted limited excavations at the site to salvage two prehistoric hearths threatened by erosion, resulting in the identification of two Late Prehistoric period components. The association between the hearths and the game drive features is unclear. Game drive features include stacked rock and brush fences, as well as circular enclosures thought to represent blinds. Through consideration of the site's topographic setting and the distribution of game drive features, a model of prehistoric game driving at the site is constructed. Game drive systems have been reported in low frequencies in Utah and Colorado, primarily in areas characterized by relatively high game populations, considerable local relief, and low vegetation.

A Comparison of Human Skeletal Remains from Virgin Anasazi, Kayenta Anasazi, and Parowan Fremont Archaeological Sites

Heidi Roberts

Human skeletal remains from archaeological sites representing three prehistoric cultural traditions, the Virgin Anasazi, the Kayenta Anasazi, and the Parowan Fremont, were examined. The objective of the study was to determine the extent of differences in the skeletal remains of the 125 individuals studied. Statistical comparisons of stature, robusticity, and cranial measurements show no statistically significant differences in skeletal metric traits. Preliminary results of the comparison of nonmetric traits show that Virgin Anasazi cranial nonmetric traits are more similar to a Mogollon series studied by Birkby (1973) than to the Parowan Fremont series. Paleopathological conditions were also compared. While most individuals in the three series were healthy, the prevalence of periostitis, osteitis, and dental hypoplasia was found to be highest among the Virgin Anasazi individuals. Two other pathological conditions frequently associated with iron deficiency anemia—porotic hyperostosis and cribra orbitalia—were most common among the Kayenta individuals and the least prevalent among the Parowan Fremont.

Steward Alcove: A Case of Superposition Dating of Barrier Canyon Style Rock Art

Nancy Coulam and Alan R. Schroedl

Pinus edulis needles adhering to a Barrier Canyon Style anthropomorph in southeastern Utah produced a radiocarbon date with a two-sigma calibrated range of A.D. 1400–1655. Because the sample was superposed over the pictograph, the pictograph must have been created before this date, perhaps as much as several hundred or even a thousand years earlier, The investigation of other cases of superposition could help shed light on the date range of the Barrier Canyon and other styles of rock art.

NOTES

Antiquities Section, Utah Division of State History, List of Reports with 1997 Project Numbers Assigned

Evelyn Seelinger

All organizations who conduct archaeological projects in the state are obliged to: (1) obtain a project number from the Antiquities Section, Division of State History and (2) submit a report on the work done. The following is a list of project numbers assigned by the Antiquities Section for projects with 1997 project numbers.

1998

ARTICLES AND REPORTS

The Confluence Site: An Early Fremont Pithouse Village in Central Utah

Rand A. Greubel

Archaeological investigations at the Confluence Site in Emery County, Utah, so named because of its proximity to the confluence of Ivie and Muddy Creeks, have revealed a preceramic occupation characterized by substantial habitation structures, large storage pits, bow-and-arrow technology, and reliance on maize farming. The site represents the most complete example of a preceramic Fremont village excavated to date in central Utah.

Carcass Corners (42WN1975): A Late Archaic Site in Wayne County, Utah

Daren D. Lupo and Kenneth L. Wintch

Archaeological excavations of Carcass Corners (42WN1975) revealed a subsurface structure associated with storage features. Radiocarbon dates from these features and other associated archaeological evidence show occupation some 2,400–3,800 years ago during the Late Archaic period. While the data recovered from Carcass Corners is modest, it is significant because the site represents a little-known time period that is transitional between Archaic and Formative economies. Furthermore, it adds to the small, but growing, database on open Late Archaic sites with habitation features.

42UN1816 – Merkley Butte

Byron Loosle and Darlene Koerner

In the early summer of 1990 members of the Uinta Basin Chapter of the Utah Statewide Archaeological Society (USAS) were hiking in the Ashley Creek area northwest of Vernal, Utah. While hiking on the steep slickrock areas west of the creek, they encountered a large vandalized Fremont site. The USAS members reported the activity to Bureau of Land Management (BLM) archaeologists. Jeanne Moe from the BLM state office visited the site in August 1990 and reported 17 possible pithouse depressions, a large number of artifacts, and abundant evidence of buried deposits. Efforts were made by BLM and Forest Service law enforcement officers to apprehend the individuals responsible for the vandalism, but video surveillance failed to

capture any additional activity at the site. Although no evidence was ever found to link anyone to the vandalism, the increased activity and interest in the site by local residents ended the vandalism activity for the present. After securing a grant from the Utah Division of State History, the Uinta Basin USAS chapter began salvage excavations in the fall of 1992 at the site we have named Merkley Butte site (42UN1816), after the family which homesteaded the area. The objectives of the excavation were to determine the extent of the vandalism and if possible excavate two pithouses for comparison to previously excavated ones in the Uinta Basin. Nearly 50 people participated in the six-week-long project, including individuals from the Forest Service, local USAS chapter, BLM, Northern Ute Tribe, Mesa College, and other local residents.

The Parowan Site and Mortonson's Site: A Preliminary Summary

Abraham Arnett

From 1954 to 1964, the University of California (Los Angeles) Department of Anthropology conducted archaeological field school excavations in the Parowan Valley of southeastern Utah. During this time, a number of sites were investigated, all corresponding to the Parowan variant of the Fremont culture (Marwitt 1970). These included Evans Mound, Paragonah, the Parowan Site and Mortonson's Site, as well as several unnamed sites in the valley. To date, one report of investigations at Paragonah (Meighan et al. 1956) and a brief article detailing the activities at Evans Mound (Alexander and Ruby 1962) constitute the only published materials pertaining to these excavations. Since the late 1960's, two Fremont habitation sites in the Parowan Valley (Evans Mound and Median Village) have been extensively investigated by the University of Utah (Marwitt 1970, Berry 1972, Dodd 1982). In consideration of the present data on the Parowan Fremont, the particulars of the UCLA excavations at the Parowan Site and Mortonson's Site, having remained in obscurity for more than thirty years, are now brought to light and placed into their proper contexts within Utah prehistory and Fremont archaeology. Investigations at Evans Mound have been numerous and extensive by both the University of Utah and UCLA. For this reason, the UCLA investigations at Evans Mound will be excluded from this discussion except for reference purposes.

1999

ARTICLES AND REPORTS

New Form for the Formative

Jacquelyn Massimino and Duncan Metcalfe

Analysis of 343 radiocarbon dates associated with the Fremont archaeological complex fails to support the findings of Talbot and Wilde's (1989) earlier study when realistic confidence levels are employed. Instead of a pattern punctuated by "peaks" and "valleys," our analysis produced variations of simple normal function: more or less uniform increase in frequency to a single peak, followed by a decline in frequency. No evidence was found for significant temporal breaks in any of the histograms. The study also considers the interpretation of radiocarbon determinations, specifically the relationship between hearth contexts and behavior, and possible implications for radiocarbon data patterns.

Ceramics and Mobility: Assessing the Role of Foraging Behavior and its Implications for Culture-History

Jason R. Bright and Andrew Ugan

Recent studies of Great Basin ceramics have focused on the relationships between mobility and degree of investment in ceramic manufacture (e.g., Bright et al. 1998; Janetski 1998; Simms et al. 1997). These studies have shown that a high degree of residential mobility results in decreased

investment of time and energy in the production of ceramic vessels, but have not tied this pattern to factors influencing mobility itself. We assume that degree of residential mobility is a result of foraging opportunities and decisions, and hypothesize that sedentism and consequent investment in ceramic technology should be greater where the structure of the resource base favors foraging for longer periods. Comparisons of ceramics from residential camps within the Great Salt Lake (GSL) wetlands to those from sites in Utah's west deserts and the Little Boulder Basin Area (LBBA) provide a test of this hypothesis. Investment in ceramic manufacture is highest in the GSL region, where foraging opportunities are available nearly year-round, and so residential moves are less frequent. Ceramic investment is lower in the more seasonal environments of the west deserts and LBBA. These results have implications for understanding variation in the timing of the appearance of low investment ceramics within the Great Basin.

Playa View Dune: A Mid-Holocene Campsite in the Great Salt Lake Desert

Steven R. Simms, Dave N. Schmitt, and Kristen Jensen

Test excavations at an extensive site in sand dunes on Dugway Proving Ground in northwestern Utah exposed a short-term camp featuring a use surface, hearths, primary refuse disposal, rabbit consumption, bi-polar core reduction, and large amounts of fire-cracked rock. Parched and charred Indian Rice Grass seeds indicate occupation in the early summer. A Humboldt projectile point is consistent with two AMS radiocarbon determinations ranging between 4,600–5,400 B.P. This case also speaks to issues of method and theory in archaeological testing: 1. The spacing among dune blow-outs suggests improvements in the design of testing strategies; 2. Test excavation can be part of the assessment of significance, rather than an adverse effect; 3. The test excavations stimulated experimental archaeology on the production of fire-cracked rock that refined estimates of the duration of occupation at Playa View Dune beyond those based on ethnographic analogy and traditional archaeological interpretation.

Inferring Intensity of Site Use from the Breakdown Rate and Discard Patterns of Fire-Cracked Rock at Playa View Dune

Kristen Jensen, Jill Jensen, and Celeste Clegg

Large quantities of fire-cracked rock (FCR) were encountered during archaeological survey and excavation of ancient campsites in the Great Salt Lake Desert in Tooele County, Utah. We propose the application of FCR as an indicator of intensity of activity at a site. A series of replication experiments were conducted to develop expectations about the amount of cooking that produces an assemblage of FCR. With five iterations of the experimental cooking cycle, the number of fragments increased by 600 percent and exhibited a 40 percent reduction in their effectiveness as boiling stones. Playa View Dune (42T0213) is a short-term campsite occupied for a length of a few days up to a month. An application of the experimentally derived breakdown rate to the FCR assemblage dramatically exceeds our expectations for routine cooking activity over a few days. As the interpretation of duration of occupation increases up to a month, so does the likelihood that the FCR represents routine cooking activity, thus a measure of high or low intensity of activity.

REVIEWS

Excavation of the Donner-Reed Wagons, reviewed by Sonia M. Evans and Timothy D. Evans

Man Corn: Cannibalism and Violence in the Prehistoric American Southwest, reviewed by Mark Stuart

Prehistoric Warfare in the American Southwest, reviewed by Kathleen Heath

2000

ARTICLES

Osteoarthritis, Mobility and Adaptive Diversity Among the Great Salt Lake Fremont

Emily Brunson

This study examines adaptive diversity in a prehistoric Fremont population from the Great Salt Lake wetlands, using the prevalence, severity, and patterning of osteoarthritis as a key to understanding mobility in this population. Findings suggest that a pattern of low residential mobility, supplemented by logistical activities of males existed across the sample. In relation to other groups from the Great Basin, the Great Salt Lake sample expresses slightly lower levels of osteoarthritis, although the difference is more apparent among the females. It is likely that they were slightly more tethered to residential bases than their Great Basin counterparts.

The Arroyo Site, 42KA3976: Archaic Level Investigations

Douglas A. McFadden

A recent flood episode in a minor tributary of Kitchen Corral Wash in central Kane County exposed extensive buried Virgin Anasazi deposits and features dating to the late Pueblo II/early Pueblo III period. Located stratigraphically beneath the Anasazi horizon were a series of charcoal lenses and surfaces that were investigated in profile only. Two of these surfaces yielded radiocarbon dates circa 3,800 B.P. Evidence is presented that suggest these underlying features represent a shallow Late Archaic pithouse that preceded later Formative developments.

THE AVOCATIONALIST'S CORNER

Osborne Russell Encounters a Wolverine

Dann J. Russell

As a student doing post-graduate studies at Weber State University in the mid 1970s, I remember looking at an oil painting in the Student Union Building by Farrell R. Collet of a mountain man having an encounter with a wolverine. I didn't give it much thought until several years later. Then, because of my interest in mountain men and current day reenactments of their rendezvous, I obtained a copy of a *Journal of a Trapper*, edited by Aubrey L. Haines. This book contained the journal of Osborne Russell, a trapper in the Rocky Mountains and eastern Great Basin during the early to mid 1800s. In my reading, I came across an encounter that Mr. Russell had with a wolverine on February 4, 1841. This event was apparently so significant to him that he devoted several pages to it. I later learned that Mr. Collet's painting was depicting this event documented in Osborne's journal. The painting is now on loan to the Weber County Commissioner's Office in downtown Ogden. Having been born and raised in Ogden within walking distance of the mouth of Ogden Canyon, and having spent many summers in the surrounding foothills, Osborne's description of the area caused me to reflect on my wanderings there. Since then a question has echoed through my mind. Where was Osborne Russell camped on February 3, 1841, the day before he faced the wolverine? To attempt to determine where he was on this day, his travels and activities just prior to this time will be examined from his writings. Russell often described his travels and surroundings in great detail. In so doing, not only will the examination point out possible locations where he had his encounter with the wolverine, it will point out that he was in the vicinity of locations known today in the Ogden Valley. Even more important archaeologically, it will point out some of the wildlife and Native Americans that made the Ogden Valley their home

in the early 1800s, and even climatic conditions that existed at this time.

Pottery Reconstruction

David Jabusch and Susan Jabusch

Avocational archaeologists seem fascinated by pottery reconstruction, but professionals are less so. This may reflect the contrast between non-professionals' interest in artifacts and professionals' focus on the information they represent. Published works on archaeological ceramics include detailed discussions on construction, curation and analyses, but no treatment of reconstruction (e.g. Olin and Franklin 1982; Shepard 1956). In any case, we have been privileged to gain experience with the reconstruction of pottery vessels while working at Petra, Jordan and in various Utah laboratories. This paper identifies some of the reasons for and against reconstruction, and describes some of the techniques we've learned over the years.

REPORTS

A Final Tabulation of Sites Recorded in the Greater Glen Canyon Area by the University of Utah During the Glen Canyon Project

Alan R. Schroedl and Daniel K. Newsome

The Glen Canyon Project was, and still is, the largest cultural resource management project ever completed in Utah. Jennings's (1966) summary of the Glen Canyon Project indicates that more than 2000 sites in southern Utah and northern Arizona were recorded by the University of Utah as part of the project between 1956 and 1963. A literature review, archival research, and a file search completed as part of a database compilation project demonstrate that fewer than 1700 archaeological and historical sites were actually recorded by the University of Utah between 1956 and 1963. More recent inventory data suggest that there were biases in the field recording procedures during the Glen Canyon Project. In the 1950s and 1960s, the University of Utah (UU), the Museum of Northern Arizona (MNA), the University of New Mexico (UNM), and the University of Colorado (UC), in cooperation with the National Park Service (NPS), performed archaeological and historical investigations in the Upper Colorado River Basin region in response to the threat of cultural resource losses posed by the construction of several dams in the region. This project was collectively and officially called the Upper Colorado River Basin Archeological Salvage Program (UCRBASP). The UC worked at Curecanti Reservoir, the UNM at Navajo Reservoir, MNA in Glen Canyon, and the UU in western and southern Utah, eastern Colorado, southwestern Wyoming, and northeastern Arizona. Most of the UU investigations were conducted in southern Utah in response to the plans for the construction of Glen Canyon Dam. The portion of the UCRBASP project conducted by the UU and MNA in southern Utah and northern Arizona became known colloquially as the Glen Canyon Project (GCP). In his final summary of the Glen Canyon Project, Jennings (1966:43) reports "the precise location of over 2000 [archaeological] sites is now known." However, a complete tabulation of sites recorded by the UU and MNA was never prepared during the GCP. In 1998, P-III Associates, Inc., compiled management data on all the archaeological and historical sites investigated by the UU on the GCP. MNA is currently compiling a similar database for sites originally investigated by its teams on the GCP.

Site 42DC823: Evidence for High Elevation Foraging in the Unita Mountains

Robyn Watkins

High elevation archaeological research in the Southern Rocky Mountains focuses on the evidence of game drives and hunting blinds (J. Benedict 1975; Cassels 1995; Hutchinson 1990). The occurrence of ground stone tools in the mountains, although noted (Black 1982:104-105; Buckles 1978: 247;

Metcalf and Black 1985:22) has not generated much research. Ground stone use is documented for prehistoric plant processing in lowland areas, but some archaeologists argue that ground stone was not used for plant processing in upland areas (J. Benedict 1991). In order to test if plants were being processed on high elevation ground stone, plant remains (pollens/phytolith/macrofloral) need to be found in association with the ground stone. Ashley National Forest archaeologists have recorded eleven sites with ground stone above 3,080 m (10,000 ft) during limited surveys. This report describes the evidence for high altitude plant utilization from test excavations done in 1999 at site 42DC823, located in the Uinta Mountains in northeastern Utah. Located at an elevation of 3,182 m (10,440 ft) in the Chepeta Lake drainage, the site is a large lithic scatter with ground stone and firepit/ hearth features. Originally, I hypothesized that plant remains from high elevation plants such as *Lewisia pygmae* and *Polygonum bistotoides* would be identified. Neither plant was identified, however, pollen analysis of a buried piece of ground stone and several features reveal interesting possibilities about the prehistoric use of the Uinta Mountains.

Early Archaic Square-Stem Dart Points from Southeastern Utah

Phil R. Geib

The third and final season of excavations at Old Man Cave in southeastern Utah (Geib and Davidson 1994) resulted in the unanticipated recovery of square-stem dart points in association with open-twined sandals from early Archaic deposits. These points are reminiscent of Gypsum or Gatecliff Contracting Stem points, which are securely dated to the late Archaic for both the Colorado Plateau and Great Basin, sometime after about 3000 cal. B.C. (see Holmer 1978, 1986; Tipps [1995:52] proposes a beginning date of about 3500 cal. B.C.). The points from Old Man Cave lack the tapered stem of Gypsum points and are thus morphologically distinctive. Nevertheless, had they been found in other circumstances, I likely would have assumed that they were late Archaic in age, characterizing them as sort of Gypsum variant. Indeed, the Old Man Cave specimens are virtually indistinguishable from some of the Gatecliff Contracting Stem points from Hidden Cave. Most significantly, the stemmed specimens from Old Man Cave retain evidence of hafting pitch identical to pitch remnants seen on the stems of Gypsum/Gatecliff points from cave sites (e.g., Holmer 1980a:Fig. 17i, m, n). The traces of mastic indicate that the Old Man Cave specimens, like Gypsum/ Gatecliff points, were "glued" to dart foreshafts instead of tied on with sinew. The square-stem points from Old Man Cave are associated with open-twined sandals, which are early Archaic diagnostics. To be certain of their temporal placement, two samples were radiocarbon dated: grass stems from around one of the points, and pitch on the base of another point. Radiocarbon dates on the grass stems of 7300±100 B.P. and 7340±60B.P. on the pitch confirm their stratigraphic assignment to the early Archaic. These points demonstrate that the practice of gluing dart points to foreshafts instead of tying them on with sinew began thousands of years earlier than previously thought for a portion of the Colorado Plateau. Given that several millennia separate the points reported here from Gypsum/ Gatecliff points, the technological shift to adhesive hafting seen in the late Archaic may still lack local precedent. This report describes and illustrates the points, presents the results of radiocarbon dating, and discusses some implications of the findings.

REVIEWS

Ants for Breakfast: Archaeological Adventures among the Kalinga, reviewed by Clay Johnson

Canyoneering: The San Rafael Swell, reviewed by Mark E. Stuart

Intermountain Archaeology, reviewed by Kae McDonald

Time, Trees, and Prehistory: Tree-Ring Dating and the Development of North American Archaeology, 1914 to 1950, reviewed by Michael S. Berry

Reply to Review by Michael S. Berry, by Stephen E. Nash

2001

PHOTO ESSAY

Culturally Modified Ponderosa Trees on the Ashley National Forest

Lawrence DeVed and Byron Loosle

For the last few years, members of the Uinta Basin Chapter of the Utah Statewide Archaeological Society have been recording an unusual site type that will soon be gone from the landscape. This article provides a description of culturally peeled trees on the Ashley National Forest that are probably the work of Native American people. These trees are an important link to the past, but are a disappearing resource. These ancient inhabitants will eventually die a natural death if they are not removed through logging, or damaged and killed by fire first. Club members Tim Sweeney, Leon Chamberlain, Lawrence DeVed, and Darlene Koerner have been studying these graceful giants. In a country where the evidence of former inhabitants rests lightly on the land, the culturally modified trees remind us that others passed this way before.

ARTICLES

Late Paleoindian Artifacts from Utah Valley

Joel C. Janetski

Late Paleoindian artifacts in the High Plains tradition are rare in the Great Basin. This paper reports Paleoindian style stone tools from Utah Valley in west-central Utah. These finds hold implications for: 1) the timing of human occupation in Utah Valley, and 2) Plains/Great Basin interaction during the terminal Pleistocene, early Holocene period (~9,000 B.P.). Interaction does not imply an intrusion of people nor do these artifacts necessarily equal the existence of a big-game hunting strategy in Utah Valley or the eastern Great Basin during this period.

Cultural Affiliation of Kachina Bridge Ruin

Nancy J. Coulam

Kachina Bridge Ruin, a storage site in southeastern Utah, has been called a San Rafael Fremont site based on the presence of adobe turtleback structures and triangular anthropomorphs painted on the inside wall of one of the turtleback structures. Based on new radiocarbon dates, the construction of the adobe structures at the site and the painting of the triangular anthropomorphs are now known to have occurred on or after A.D. 600–655, a time when upper White Canyon was occupied by Mesa Verde Anasazi, not Fremont. A literature review of turtleback structures and triangular anthropomorphs indicates that these traits cannot be considered diagnostic of the Fremont, and that Kachina Bridge Ruin is a typical Anasazi site for the region.

THE AVOCATIONALIST'S CORNER

The Ogden High Graffiti Rock

Dann J. Russell

To declare that rock art in the state of Utah is abundant is an understatement. One need only visit the many state and national parks throughout Utah or browse the literature sold at their visitor centers. One book documenting the best known of this art is the multi-volume set Petroglyphs *and Pictographs of Utah* by Kenneth B. Castleton M.D. Most rock art in the state can be attributed to prehistoric Native Americans, but not all. Dr. Castleton's book documents three panels that

appear to be historic (Castleton 1987:64, 91). Another panel not documented by Castleton, similar in appearance, is located near Ogden and referred to by some residents as the "Ogden High Graffiti Rock" (Sawatzki 1996:5). This article will document the panel, compare it to similar panels described by Castleton as well as other rock art in Utah, and explore the questions of how, when, and why they were produced.

A Tip On Stabilizing Ceramic Vessels

Barb Jolly and Roy Jolly

Jim Starr (Dixie-Jennifer Jack Chapter USAS) knows that patience and ingenuity are the prerequisites for ancient pot reconstruction. The St. George octogenarian has drawn attention throughout Utah with his innovative method using coat hangers to stabilize pots, instead of plaster of Paris. Starr retired in 1977 and began his career as an avocational archaeologist in 1990 by taking classes taught by Diana Hawks, BLM archaeologist. While working on the South Gate excavation, BLM archaeologist Gardner Dalley asked Starr if he would be interested in reconstructing pots. Since then, he has reconstructed approximately 40 pots, and each pot requires 40 to 50 hours to complete.

REVIEWS

A History of Dogs in the Early America, reviewed by Mark E. Stuart

Kachinas in the Pueblo World, reviewed by Jon R. Moris

The Art of the Shaman: Rock Art of California, reviewed by Steven R. Simms

Prehistory of the Carson Desert and Stillwater Mountains: Environment, Mobility, and Subsistence in a Great Basin Wetland, reviewed by David W. Zeanah

2002

DISCUSSION

The Link Between the Fremont and Modern Times

Nancy J. Coulam and Steven R. Simms

The lead article in this issue of Utah Archaeology "Fremont Basketry," by James Adovasio, David Pedler, and Jeff Illingworth, anchors a discussion with a dual purpose. The synthesis of decades of study directed at Fremont basketry will be useful for readers who seek understanding of the Fremont from as many vantages as possible. The article is clearly written and illustrated, and the frank exposition enables the perspective, problem emphasis, and conclusions of the authors to be placed in the context of the literature on the Fremont. There is however, a second purpose for this publication. The study of Fremont basketry is one of five reports prepared for the United States Bureau of Reclamation as part of a comprehensive evaluation of the cultural affiliation of Fremont in relationship to modern Native American tribes. Reclamation is charged with this task under the Native American Graves Repatriation Act of 1990 (NAGPRA). The study of Fremont basketry that appears here, as well as the other reports commissioned by Reclamation, illustrate that when it comes to human remains and cultural heritage, the past is with us in the present and some of the questions asked of scientists are shaped by current legal and political climates. Adovasio, Pedler, and Illingworth's article is followed by a discussion. Catherine Fowler and Joyce Herold raise observations about the article and the relationship between NAGPRA and anthropological study. The authors then take their opportunity to reply. Finally, Forrest Cuch, Director of the Utah Division of Indian Affairs and Kevin Jones, State Archaeologist with the Utah Division of State History, were invited to contribute concluding insights from their unique vantage within state government.

Fremont Basketry

James M. Adavasio, David R. Pedler, and Jeff S. Illingworth

Comments on "Fremont Basketry" By J.M. Adovasio, D.R. Pedler, and J.S. Illingworth

Catherine S. Fowler

Commentary on "Fremont Basketry"

Joyce Herold

Reply to Coulam & Simms, Fowler, and Herold

J.M. Adovasio, D.R. Pedler, and J.S. Illingworth

Concluding Comments: Science, NAGPRA, Law and Public Policy

Kevin T. Jones

PHOTO ESSAY

Paleoindian Point Types of Northern Utah

Dann J. Russell and Mark E. Stuart

Northern Utah residents have recovered a wide variety of Paleoindian and Paleoarchaic point types that belong to periods ranging from over 12,000 to 7000 B.P. or later. Some of these points have been documented individually (Russell 1993), but a collective grouping to describe and provide general provenience for them, as well as to present good-quality photographs seems appropriate. We organize the descriptions and photographs by point type, beginning with the earliest, and by the locality of finds. All of the specimens reported here were found on the surface. None of the sites or individual specimens is dated, either directly or through site context However, age ranges are known for the types based on dates from sites in other regions, especially the Plains, and we report those age ranges in radiocarbon years (Pitblado 2003), we also include descriptions and photographs of some unknown types in the hope that better documentation of variability in what may be early points may improve the typologies.

ARTICLES

Institutional Constraints on Social and Economic Fluidity in Farmer-Forager Systems: Bioarchaeology and the Sexual Division of Labor in Prehistoric Utah

Jason Bright

The Formative period in the eastern Great Basin is marked by considerable economic and social variation, as individuals cycled in and out of farming modes. Such cycling may have been difficult, because the two economic options include contrasting social institutions that may clash, and therefore inhibit change. The sexual division of labor is one such institution that may vary between the two ends of the subsistence cycle. However, bioarchaeological data suggest that men and women were able to maintain broad similarities in the sexual division of labor, whether farming or foraging. Being able to maintain their interests in this regard across the economic spectrum loosened social constraints to switching and facilitated economic cycling.

Settlement Location as a Reflection of Economic Strategies by the Late Prehistoric Fishermen of Utah Lake

Michelle K. Knoll

While most central place foraging models focus on caloric return as a quantifiable currency, other viable currencies should be considered as well. One alternative proposed is storability, which was likely an important attribute for those who practiced collection strategies, and may have been a quality that was actively sought after in potential food. This paper examines the relationship between storability of fish, fish spawning habitats, and

settlement location at five sites surrounding Utah Lake. Archaeological evidence shows that the Late Prehistoric occupants at these sites procured storable species in greater frequency than non-storable species, and that their residential camps were always located in close proximity to preferred spawning habitats of storable fish.

Oranjeboom Cave: A Single Component Eastgate Site in Northeastern Nevada

Paul Buck, Bryan Hockett, Kelly Graf, Ted Goebel, Gene Griego, Laureen Perry, and Eric Dillingham

Excavations in Oranjeboom Cave (26EK1722) in northeastern Nevada near the Utah border reveal a single component site containing Eastgate points and Great Salt Lake grayware sherds. The central feature of this site is a prepared living surface covered with stripped juniper bark matting and an single-use hearth. Calibrated 2-sigma radiocarbon dates place use of the site at about 1100–970 B.P., reflecting a single short term event. Faunal remains indicate preparation and consumption of bison and other large-to-medium sized mammals. The lithic assemblage is dominated by broken bifaces and abundant small pressure flakes, suggesting tool kit repair. Pine and juniper were used as fuel, and food remains include goosefoot, pine nuts, and juniper berries. The assemblage from Oranjeboom Cave shows that Fremont foragers using bows and arrows were exploiting areas west of the Bonneville Basin by at least 970 B.P.

THE AVOCATIONALIST'S CORNER

Burnt Station: What Really Happened in Overland Canyon*

David M. Jabusch, Susan Jabusch, and Melvin Brewster

Here we report an integration of our field investigations with historical accounts about Overland Canyon Stage from approximately 1859 to 1869. Although these stations seem relatively insignificant along the Pony Express and Overland Stage route, Overland Canyon was the focus of troubles with Paiute and Goshute Indians during this period. In this study we build upon our previous research, and in particular use archaeological survey to sort out the sometimes conflicting historical accounts regarding the location and construction of these stations, as well as the horrible events that happened at one of them.

REVIEWS

Canyoneering 3, reviewed by Lisa Westwood

Singing Stone: A Natural History of the Escalante Canyon, reviewed by Lisa Westwood

2003

ARTICLES

Ceramic Production, Fremont Foragers, and the Late Archaic Prehistory of the North-Central Great Basin

Bryan Hockett and Maury Morgenstein

Recent excavations at the Scorpion Ridge site, combined with chemical and petrographic analyses of the ceramic sherds recovered from that site and others in the area, suggest that Fremont plain wares were locally manufactured in the Upper Humboldt drainage by at least 1200 B.P. Thus, local ceramic production in portions of the central Great Basin occurred at least seven centuries earlier than the initial manufacture of Intermountain Brownware. Nevertheless, all of the Fremont and Intermountain Brownware ceramic samples analyzed here from the Upper Humboldt drainage basin were tempered with a schistose biotite granodiorite that contrasts with the monzonite temper found in plain wares from Ruby Valley, located on the east side

of the Ruby Mountains. Fremont wares from the west Bonneville Basin region were tempered with materials unlike those of the Upper Humboldt River basin, and at least one of these vessels was probably manufactured in central or southern Utah. The projectile points from Scorpion Ridge include Nawthis Side-notched, and this may be the oldest and northernmost occurrence of this type found to date. The relationship of the inhabitants of the Scorpion Ridge site to farmers inhabiting the Fremont core region is uncertain, but it once stretched into the central Great Basin.

Commodity Flow and National Market Access: Historical Archaeology in Salt Lake County

Jakob D. Crockett

The Commodity Flow Model is an effective method for predicting the composition of late nineteenth and early twentieth century household assemblages. By utilizing a supply-side economic perspective, observed archaeological patterns are firmly linked to the culturally derived variable of market access, increasing our understanding of the spatial distribution of household consumer goods. Through an alternate application of the model, a new and successful method for determining changes in consumer preference for locally manufactured household goods is demonstrated. By way of intersite comparisons, a new pattern of changes in the national market is revealed. Primary data come from two early twentieth century trash deposits located in Salt Lake County, Utah (Seddon 2001).

PHOTO ESSAY

The Botanical Parts of the Patterson Bundle: An Herbalist's Discovery*

Merry Lycett Harrison and photographs by Jim Blazik

In the early 1980s, Thompson's Springs residents Bryce and Margaret Patterson were hiking in a remote area of the Book Cliffs near Green River, Utah, when they noticed a thin strand of leather under a knee-high rock ledge. Margaret dug around it to see what it was and followed it through soil and layers of juniper bark to discover a large, leather wrapped bundle that she took home. The Pattersons kept it for several years and Margaret explained to me that she tried to keep all the contents intact. After Bryce's passing, Margaret gave the bundle to U.S. Bureau of Land Management Moab Field Archaeologist, Bruce Louthan. My interest in the Patterson Bundle was sparked when I noticed one of these smaller bundles in the display case. It appeared to contain roots. As a trained clinical herbalist who harvests roots of wild plants to use in my pharmacy, my curiosity was piqued. I obtained permission from Louthan to more closely examine this grouping and knew at first glance that one of the roots was from osha, *Ligusticum porteri*, that grows in the mountains near Moab. It is a very potent medicinal herb that I use to help relieve respiratory symptoms. I wondered if the other roots could be from such useful medicinal plants. Permission to study the contents of the Patterson Bundle came with the stipulation that I report my findings to the BLM. My primary focus would be to try to identify the botanical parts. The results of my research were first published in Harrison (2002).

THE AVOCATIONALIST'S CORNER

Pump Organ Reeds: Archaeology, History, and Music Come Together at the Frary Site

Ronald J. Rood

Archaeological testing on Antelope Island State Park at a small homestead known as the Frary Site produced several metal artifacts linking one small but significant aspect of homestead life to the archaeological and historical record. In the case of the Frary Site and these particular small metal artifacts, archaeology and history come together under a tangible and familiar aspect of many people's lives: music. Whether performed

by professionals, garage bands, a church choir, or played and sung around the house or campfire with family and friends, music is something most of us can appreciate. Although a review of the archaeological evidence for musical instruments is beyond the topic at hand, the first musical instrument used by the earliest humans may have been one rock bashed against another in a repeated rhythm. The oldest dated musical instruments in the world were found at the early Neolithic site of Jiahu in China, where six nearly complete flutes and fragments of 30 more were dated to almost 9,000 years ago (Zhang et al. 1999), Since the dawn of humanity, music has likely been an important aspect of human life.

Great Salt Lake V-Edge Cobbles

Dann J. Russell

Some ground stone pieces recovered from excavated sites on the northeastern shoreline of Great Salt Lake appear to exhibit a unique ground edge. Personal observations during the Great Salt Lake Wetlands Project and the Willard Burial Recovery revealed a large number of stones with this same edge. My aim here is to better document these artifacts by summarizing the existing information, provide photographs and illustrations, and discuss some possibilities for the use of these artifacts.

REPORTS

The Desha Caves: Radiocarbon Dating and Coprolite Analysis

Phil R. Geib and Michael R. Robins

In the summer of 1930, Irwin Hayden excavated two caves along the east side of Desha Canyon, then known as Cornfield Canyon, on the northern edge of the Rainbow Plateau in southeast Utah. His excavation of Desha Caves 1 and 2 was part of the Van Bergen Expedition of the Los Angeles County Museum of Natural History. The expedition also excavated at the large Tsegi Phase (late Pueblo III) site of Segazlin Mesa (see Lindsay et al. 1968). Rumor has it that Byron Cummings, who dug on Segazlin Mesa previously, was displeased to find outsiders working on 'his' site and sent the expedition packing. Excavation of the two caves ensued; evidently they were unclaimed or of little interest to Cummings. Both sites produced artifacts similar to those described by Guernsey and Kidder (1921; Kidder and Guernsey 1919) from Basketmaker II caves near Kayenta, Arizona. Allan Schilz (1979) incorporated Irwin Hayden's (1930) unpublished manuscript on the two caves into a Master's thesis, in which he presented an analysis of the recovered remains. Because Schilz did not radiocarbon date any artifacts or other remains for his study, the age of Basketmaker occupancy of both sites remained unknown, but was assumed to fall within the first half millennium of the Christian era. With the revelation that Basketmaker II remains from the type sites of White Dog Cave and Kinboko Caves 1 and 2 are as old as 600 cal B.C. (Smiley et al. 1986; Smiley 1994:Table 1), there was reason to suspect similar antiquity for the Desha Caves. The age of the Basketmaker remains at both sites has relevance for our broader understanding of the Archaic-Formative transition on the Colorado Plateau and in this specific case for the transition on the Rainbow Plateau as it relates to a moderate-size excavation project along the Navajo Mountain road, N16 (Geib et al. 2003). The N16 excavations included 17 open sites with Basketmaker II components. We were interested in learning the temporal relationship between the rockshelter-using Basketmaker II and the open sites we had excavated along the road right-of-way.

An Apparent Case of Treponemal Disease in a Human Burial from the Northern Great Salt Lake

Silvia E. Smith, Buck Benson, and Patricia M. Lambert

The skeleton of a male adult with layered, bony lesions on most of his arm and leg bones was

recovered near Willard Bay during salvage excavations conducted by Utah State University in October, 2001 (Lambert and Simms 2003). One of a number of complete or partial skeletons found eroding from lake bed deposits at 42B01071, Burial 1 was one of five individuals discovered in Area 1. A second male adult from this area (Burial 2), also had superficial (periosteal) bone lesions on a couple of leg bones. The proximity of the burials to each other and the similarity of their lesions suggest that both men may have been affected with the same disease. Although previous researchers have reported periosteal lesions in human skeletal remains from other locations in the Great Basin (Larsen and Hutchinson 1999; Nelson 1999), none has ever specifically identified a disease that might account for these lesions. The purpose of this paper is threefold: 1) to review the osteological evidence for disease in these two individuals; 2) to explore the possibility that bone lesions in these individuals were caused by treponematosis, an infectious disease widely documented elsewhere in prehistoric North America; and 3) to investigate why a disease such as treponematosis might be present in the Willard Bay sample but not in others from the Great Basin region.

REVIEWS

Kaibabitsinungwu: An Archaeological Sample Survey of the Kaiparowits Plateau, reviewed by Alan D. Reed

Stone Age Spear and Arrow Points of the Southwestern United States and Stone Age Spear and Arrow Points of California and the Great Basin, reviewed by Pat Paeper

Tracing the Past: Archaeology Along the Rocky Mountain Expansion Loop Pipeline, reviewed by Ronald J. Rood

2004

ARTICLES

Current Issues in Cultural Resource Management Institutions

David Yoder

Trends among the institutions and individuals that practice Cultural Resource Management is important information to both archaeology students and professionals. To identify and quantify these trends, a survey was composed and sent to fifty CRM firms in Utah and nearby states. Questions focused on the institutions, personnel, salaries, job security, satisfaction, and direction. The information garnered from this survey was analyzed and compared to national data to examine trends in contract archaeology in the Utah area.

Spotten Cave Re-Visited: A Re-Analysis of the Projectile Point Assemblage

Aaron Woods

Spotten Cave (42UT104) is located near Santaquin, Utah. It was excavated in the 1960s, and is one of two recorded cave sites in Utah Valley. As such, the site can clarify some questions concerning the general chronology and cultural occupation of the cave and Utah Valley. Spotten Cave yielded a large number of projectile points, ceramics, and perishables. With a few exceptions, little has been said about the artifact assemblage from Spotten Cave. Re-analysis of the projectile point assemblage enables a discussion of Spotten Cave's chronology, its stratigraphic zones, and updated information concerning its projectile point assemblage.

Prehistoric Bedrock Mortars in Southeastern Utah

Matthew J. Landt and Jenn Mueller

Four bedrock mortars have recently been located at two sites (42Sa22846 and 42En13127) on lands managed by the Bureau of Land Management (BLM) in southeastern Utah. With a few exceptions, southeastern Utah is a poorly researched area where archaeological evidence of Fremont and Great Basin peoples is interwoven with evidence of Northern Anasazi and American Southwest occupations. These bedrock mortars are located in the edge of pinyon-juniper plant communities on low-angle bedrock, directly adjacent to sagebrush and grassland flats. The bedrock mortars are found in sites with long-term occupations that span the mid- to terminal Archaic.

THE AVOCATIONALIST'S CORNER

Running Antelope: Revisited

Dann J. Russell

In 1993 I authored an article for the journal about a Haskett site entitled "Running Antelope: A Paleoindian Site in Northern Utah" (Russell 1993:79). Several years after its publication, it caught the attention of Dr. Bonnie Pitblado of Utah State University. At that time, she was a graduate student at the University of Arizona. Her purpose for contacting me was to examine the artifacts from the Running Antelope Site (42B0538) and use the information in her Doctoral Dissertation. She sent five specimens from the site to Dr. Richard Hughes of the Geochemical Research Laboratory in Portola Valley, California for sourcing by x-ray fluorescence. She provided me with a copy of the data obtained by Dr. Hughes upon returning the specimens. In 2002 the Promontory/ Tubaduka Chapter of USAS obtained a grant from the Utah Division of State History for archaeological research by avocationalists. Some of this money was used to pay Dr. Hughes for sourcing specimens from various sites in Northern Utah. Five of these came from Running Antelope. This report will present both sets of sourcing results from the Geochemical Research Laboratory, describe the specimens, and discuss what the results are possibly telling us. The first set (1) is those specimens sent by Dr. Pitblado (Hughes 1997) and the second set (2) is those sent by myself (Hughes 2002).

REVIEWS

From Hunters to Homesteaders: Recent Encounters with Past Communities in Utah's West Desert, reviewed by Ronald J. Rood

Greater Mesoamerica: The Archaeology of West and Northwest Mexico, reviewed by Walter A. Dodd.

INSTRUCTIONS TO AUTHORS:

Authors submitting manuscripts are requested to follow the Society of American Archaeology (SAA) style (see Style Guide American Antiquity 48:429–442 or on the SAA website at the following link: www.saa.org/publications/styleGuide/styleGuide.pdf). Articles must be factual with some archaeological application. We seek submissions from authors affiliated with government agencies, cultural resource management firms, museums, academic institutions, and avocational archaeologists equally.

Paper categories include:

1. Articles: Synthetic manuscripts, reports of analysis, overviews, and reviews of past research.
2. The Avocationalist's Corner: Topical articles written for the nonspecialist. Articles for this section are encouraged from avocational and professional archaeologists alike.
3. Reports, notes, and comments: Shorter manuscripts including descriptive reports on focused topics; notes or points of interest with a minimum of interpretive discussion; comments on current issues or previously published works. Comments on previously published works will be submitted to the author of that work for review and reply.
4. Photo/illustrative essays: Photo or illustration based articles with descriptive and/or interpretive text to supplement the visual media.
5. Book Reviews: Reviews of current publications that are broadly relevant to archaeology of Utah.

Submission:

Manuscripts should be submitted in an electronic format, as *Utah Archaeology* cannot retype papers. Authors are encouraged to send files as e-mail attachments to the editors, although manuscripts may also be submitted on a CD. Microsoft Word (DOC) files are strongly encouraged. 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. The editors reserve the right to evaluate manuscripts for appropriate subject matter, quality, length, and compliance with the style guide, and will likely reject submissions which do not conform to the stipulated requirements.

Formatting:

Manuscripts must be typed on 8.5 by 11 inch paper with 1 inch page margins in 12 point font and double-spaced. Submissions should contain appropriate headings and subheadings and have a brief abstract of 150 words or less. Manuscripts should be paginated consecutively beginning with the title page.

Tables, Figures, and Illustrations:

Authors are responsible for submitting illustrations, photos, and tables of publishable quality, as *Utah Archaeology* will not be responsible for making them presentable and will only make minor adjustments. Figures should be submitted electronically (one figure per file) and authors are responsible for providing a high resolution (minimum 300 dpi at printed size) file in either a TIFF, JPG, PSD, or PDF file format. Please DO NOT paste figures or tables into word processing document files. Tables should be submitted either as separate files (one per file) or combine into a single workbook or similar format with one table per sheet. Table formatting should follow the SAA style guide (see above). For all photos, illustrations, and tables please include captions in a separate text file. Please name all figure and table files with their corresponding association in the text (e.g. Figure 1.jpg or Table 1.xls) and use matching names in the caption text file.

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