THE ARROYO SITE, 42KA3976: ARCHAIC LEVEL INVESTIGATIONS

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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.

In the spring of 1994 emergency excavations were conducted by the Kanab Field Office, Bureau of Land Management, at 42KA3976, a late Pueblo II/Pueblo III residential site located along Kitchen Corral Wash, a major tributary of the Paria River. The site had been severely damaged by a recent wash cut that exposed a number of buried architectural features. 42KA3976 was one of six Anasazi (Baskemaker III–Late Pueblo II) residential sites recorded during a clearance inventory of the Kitchen Corral Wash bottomlands. No Archaic period sites were recorded. At an elevation of 5,560 feet, the vegetation of the broad valley floor is dominated by big sage (Artemisia tridentata). The old growth sage brush was scheduled to be burned and drill-seeded as part of a rangeland revegetation project. With the exception of 42KA3976, all of the sites occur on the pinyon-juniper covered ridges above the valley floor; 42KA3976 is situated on alluvial outwash at the base of a colluvium-covered slope.

The varied terrain and geology of this portion of the Grand Staircase physiographic section (Stokes 1977) insured that a variety of floral, faunal and geological resources were locally available to its prehistoric inhabitants. Several springs occur in the canyon, the closest to 42KA3976 is less than one kilometer away. The narrow floodplain of the wash itself is located 600 meters to the east of the site and was probably used for agriculture by the Anasazi. The intervening expanse of alluvium offered opportunities for both dry farming and alkali field systems that took advantage of the lateral outwash fans. Although the practice of agriculture structured Anasazi settlement, subsistence was not restricted to agriculture: in addition to native vegetation, Anasazi midden deposits at the Arroyo site held quantities of bone including mountain sheep (Ovis canadensis), mule deer (Odocoileus hemionus), and pronghorn (Antilocapra americana) (Nauta 1995).

In the absence of agriculture, Archaic subsistence practices could have relied on locally available native species. Native floral resources, including Cheno-ams (goosefoot family and pigweed) and various seed-producing grasses, were available on the valley floor. The modern Paunsagunt mule deer herd migrates down Kitchen Corral Wash from the high plateaus to their winter range, and probably did so in the past. Open range near the site was likely suitable for pronghorn, and sheep habitat occurs in the rugged cliffs above the site. Taking into account resources such as pinyon (Pinus edulis) and other upland species available from the surrounding slopes, the Arroyo site could have
provided Archaic inhabitants a relatively sedentary base for year-round foraging, or a temporary camp used to exploit seasonally available resources.

SITE DEPOSITIONAL HISTORY

The Anasazi horizon of the Arroyo site was buried by over one meter of alluvial outwash that had accumulated within the past 800 years. Flood episodes sealed the cultural deposits and features and protected them from additional weathering and looters. A recent, very intense flood episode created a deep, straight-sided arroyo cut through the center of the site. The 2.5 m deep cut exposed a 40 m long Anasazi horizon that included a masonry roomblock, two fully subterranean pithouses, two "miniature pitstructures," and numerous small features and use surfaces (Figure 1). Excavation units were opened to expose the Anasazi features in plan and they were subsequently excavated (the excavation report is in preparation; see McFadden 1999 for a brief review).

This report describes evidence for a deeper, apparently extensive, Archaic level and an apparent shallow "pithouse" in the stratum that underlies the Anasazi level. The lower stratum is a dense consolidated alluvium that corresponds with a soil unit described by Kulp (1995) as "Pre-Anasazi Alluvium." Kulp places
The upper date for the deposition of this unit at 2910 B.P. He goes on to say “While no absolute age data or detailed sedimentology is currently available for these floodplain deposits, it seems likely that they may represent the floodplain environment of the channel system...” (Kulp 1995:21). Excavation undertaken in Unit B indicated that the pre-Anasazi alluvium lies directly on the Petrified Forest Member of the Chinle Formation.

Because the Anasazi horizon was continuous over the site and only discrete structural features were excavated, areal excavation of the underlying Archaic level was not possible. Thus, investigations were limited to the exposed profiles in the arroyo cut and the excavation units.

EXCAVATION METHODS

The initial recording of the Anasazi features at the Arroyo site involved drawing a profile of the east wall of the wash. This continuous vertical face offered excellent control for examining the buried Anasazi features as well as the deposits above and below them (Figure 2). Numerous sherds and artifacts in the ash-stained sands of the upper level, as well as the features that originated from it, indicated that the horizon was obviously Anasazi. A distinct lens of charcoal located on both walls of the wash and beneath the Anasazi stratum was noted and drawn. This lens is referred to as Feature 21 (F21) on the east wall and Feature 34 (F34) on the west wall of the arroyo which, at this point, was about two meters wide (Figure 3). Another lens of charcoal, at about the same elevation, was noted in the arroyo cut eight m to the south. While the lens may have been continuous at one time, it appeared to have been truncated by the prehistoric excavation of the pithouse in Excavation Unit B. Subsequent excavation of the mostly unlined pit structure revealed charcoal in its east wall offering evidence that, while the lens was not necessarily continuous, a surface occurred at the same elevation in the deposits. In all, exposed profiles of the lower charcoal lenses could be identified over an area measuring 8 by 2 m. No soil horizon or occupation surface could be identified beyond the charcoal lenses.

Evidence for the “Pithouse”

The excavation of F34 was limited to a 10 cm deep by 20 cm high cut above a distinct soil contact formed by a lens of charcoal-impregnated clay resting on the pre-Anasazi alluvium (Figure 4). The only artifact in the feature was a portable slab milling stone that lay directly on the surface near the south end of this 1.5 m long excavation unit (Figure 5). No occupation surface or level of origin for the F34 surface was discernible in the
profile. A composite sample of small charcoal fragments was collected from the lens for radiocarbon dating, a bulk macrofossil sample was obtained, and a pollen sample was taken from beneath the milling slab.

F21, exposed in the opposite bank, was a dish-shaped soil contact nearly four meters long, originating 60 cm below the Anasazi stratum and nearly two m below the modern surface (Figure 2). Fill above the contact with the pre-Anasazi alluvium was a charcoal/ash and ash-impregnated sandy clay similar to that of F34. In the center of the feature was a basin shaped depression 85 cm in diameter and 30 cm deep. Pollen samples were collected from the surface in the depression and from the alluvium both above and below the feature. A bulk macrofossil sample was collected from the depression. F21 and F34 are thought to be occupational surfaces.

Radiocarbon dates from composite samples of small charcoal indicate that Features 21 and 34 are roughly contemporary (Figure 6). Additional traits held in common that suggest they belong to the same feature include their origination at the same elevation in the pre-Anasazi alluvium (Figure 3), the similarity of the F21 and F34 occupation surfaces, and the nearly identical fill above them. Evidence that these are part of a pithouse includes the basin-shaped depression that appears to be a hearth, and a single fragment of fired clay daub that suggests a lightly constructed superstructure of brush and clay.

MACROFLORAL AND POLLEN ANALYSIS

Macrofloral Analysis

Martin (1995) analyzed the remains of carbonized plant materials from F21 and F34. A volume of 4.5 liters from F34 yielded a single Helianthus sp. seed. A volume of 6.9 liters from F34 (which included the putative “hearth”) yielded a total count of 30 charred seeds, including: Asteraceae (n = 1), Chen-Ams (n = 10), Chenopodium sp. (n = 6), and unidentifiable (n = 13) specimens. Also noted in each feature was a small quantity of Pinus sp. bark and needles. No local comparative data exist to assess the significance of these counts. It is noted, however, that these taxa continue to be used during the succeeding Formative period (Marlin 1996, 1997).

Pollen Analysis

Cummings (1995) analyzed pollen from four locations associated with the Archaic level. Pollen samples were collected from beneath the milling slab on the F34 surface, from the “hearth” depression surface in F21, and from sterile contexts both above and below F21 in the pre-Anasazi alluvium (Figure 2).

The pollen samples collected and examined from the Archaic level exhibited a pollen record different from all of the Anasazi samples. The “pithouse” samples were dominated by Artemisia pollen; Pinus and Juniperus pollen counts were generally smaller than those noted in the Anasazi samples. Other species present included Asteraceae, Chen-ams, Sarcobatus,
Figure 4. Collecting charcoal from F34. Note milling slab at left.

Figure 5. Milling slab from Archaeic surface (49 x 32 x 3.5 cm).
Table 1. Radiocarbon Dates from the Archaic Level at 42KA3976.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Laboratory Number</th>
<th>Material</th>
<th>Context/Control</th>
<th>B.P. Age</th>
<th>2 Sigma Range</th>
<th>Cal. Curve</th>
</tr>
</thead>
<tbody>
<tr>
<td>42KA3976</td>
<td>Beta 77109</td>
<td>Charcoal</td>
<td>F34 Surface West Side</td>
<td>3370 ± 80</td>
<td>1880–1450 B.C.</td>
<td>1660 B.C.</td>
</tr>
<tr>
<td>42KA3976</td>
<td>Beta 77118</td>
<td>Charcoal</td>
<td>F21 Hearth East Side</td>
<td>3420 ± 90</td>
<td>1935–1505 B.C.</td>
<td>1705 B.C.</td>
</tr>
</tbody>
</table>

Ephedra, and Poaceae. Small quantities of hollow starch granules, and starch granules with hila that are typical of grass seeds, were also recovered. The pollen sample taken beneath the milling slab yielded sagebrush seeds, Chenopod seeds, grass seeds, and a member of the Solanaceae (potato/tomato) family, holding open the possibility that any of these may have been processed using the milling stone (Cummings 1995).

**DATING AND CHRONOLOGY**

The two radiocarbon dates from F21 and F34 (Table 1) place the putative pithouse within the Late Archaic period, 3300–1500 B.C. (Tipps 1995).

Although no projectile points were found in the Archaic level of the Arroyo site, Gypsum dart points, a key diagnostic of the Late Archaic period, are relatively common on the Grand Staircase (Keller 1987), Kuiperowits Plateau (Geib et al. 1999), and Arizona Strip (Fairley 1989). Keller’s (1987) inventory on the Skutumpah Terrace, located about 20 km northwest of the Arroyo site, recorded 10 Late Archaic sites and a total of 34 Gypsum points. A collection of Gypsum points, reported to have been found on the terrace between the Skutumpah and the Arroyo site, are made of Petrified Forest Member chert (Figure 7). The source of this distinctive agatized wood is the Chinle Formation, which is exposed at the base of the Vermilion Cliffs.

Dates for Gypsum points are generally cited in 2500 B.C. to A.D. 500 (Holmer 1986). Based on a reanalysis of dated points from Sudden Shelter, Tipps (1995:52) cites their range as 3500 and 1500–1000 B.C. for the northern Colorado Plateau. On the Grand Staircase section of the southern Colorado Plateau, Gypsum points seem to have persisted into the Formative period. Eccles and Walling Frank (1998) describe Gypsum points from securely dated Basketmaker II (circa A.D. 200) contexts at the Reservoir Site on the Utah–Arizona border at Colorado City (Nielson et al. 1996).

In addition to diagnostic projectile points, the Barrier Canyon rock art style, dated between 2000 B.C. and A.D. 300 in the Canyonlands region (Tipps 1995:168), occurs locally on the Grand Staircase (Judd 1926;122) and supports the impression of a widespread Late Archaic occupation on the southern Colorado Plateau. To date, however, recorded Late Archaic site types on the Grand Staircase are restricted to lithic scatters (Brown 1982), lithic and groundstone scatters (Keller 1987), and rockshelters (Janetski and Wilde 1989). Few open camps and no residential structures have been attributed to the Late Archaic period on the southern Colorado Plateau.

**CONCLUSIONS**

Although only tentative conclusions can be drawn from the limited investigations of the Archaic level at the Arroyo site, the findings can help formulate a model of settlement and subsistence for the Late Archaic on the Grand Staircase section of the Colorado Plateau. If, in fact, the preferred location for semi-permanent Late Archaic camps was in alluviated bottom lands, such sites are likely to be under-represented by
surface inventories. Ultimately, their identification may require geomorphological studies of sediments and buried soil horizons exposed in wash profiles of the numerous alluvial filled valleys on the Grand Staircase.

The identification of a Late Archaic population on the Grand Staircase has important implications for understanding the origins of Virgin Anasazi agriculture. Was the local adoption of agriculture a process of diffusion to existing bands of hunter-gatherers, or was the spread of maize the result of a migration of agriculturalists from the south (Reify and Beuyl 1985)?

In support of the migration hypothesis, Geib and Davidson point out that there appears to be an occupational hiatus of rockshelters in the Four Corners area between 3,500 to 2,500 years ago, just prior to the Basketmaker II period (Geib and Davidson 1994:201). On the Grand Staircase the continuity of occupation is unclear—only a few sites have been dated to the period immediately preceding the relatively well known Basketmaker II era (Figure 8). The handful that have been reported only hint at the presence of a large enough population to adopt the Formative lifeway. Further, all of the available dates are the result of limited excavations that lack the context to flesh in details of local settlement pattern and adaptive strategy.

Nevertheless, the diffusion of agriculture to an existing population on the Grand Staircase remains a viable hypothesis. Both the wide distribution of Late Archaic rock art styles, and particularly the temporal continuity of Gypsum projectile points, suggests that there was no occupational hiatus on the Grand Staircase immediately prior to the introduction of agriculture. If an in situ population of Archaic foragers is eventually described then local adaptation, rather than population migration may best account for the distinctiveness of the emerging Virgin Basketmaker II culture.
Acknowledgments. The excavations at the Arroyo site involved many people. Those directly involved in the investigation of the Archaic level include: Gardner Dalley, Diana Hawkes (Christensen), Geralyn McEwen, and Laird Naylor of the Bureau of Land Management (BLM). I am indebted to them for their skilled observations and hard work. I am especially pleased to have worked with Steve Martin, U.C.L.A., who collected and analyzed the macrobotanical data as part of his Ph.D. dissertation. Thanks also goes to Verlin Smith, BLM, Kanab Field Office Manager, for his support of the project and Garth Portillo, BLM, Utah State Office Archaeologist, who provided funds for analysis. I thank Gardner Dalley, Bill Davis, and an anonymous reviewer for their editorial comments and advice.

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**NOTE**

The initial excavations at the Arroyo site were conducted as emergency data recovery directed at the remnants of obvious Anasazi structures. Our knowledge of Virgin Anasazi site layouts suggested that the site was extensive and that the initial investigations would recover only a sample of the features present. In anticipation of future investigations at the site, permanent datums were placed that would facilitate re-establishing the grid system.

The definition of an underlying Archaic level significantly expands the research opportunities at the site. Potential future investigations at the Arroyo site will be carried out under the supervision of the USDI, BLM, Grand Staircase-Escalante National Monument.