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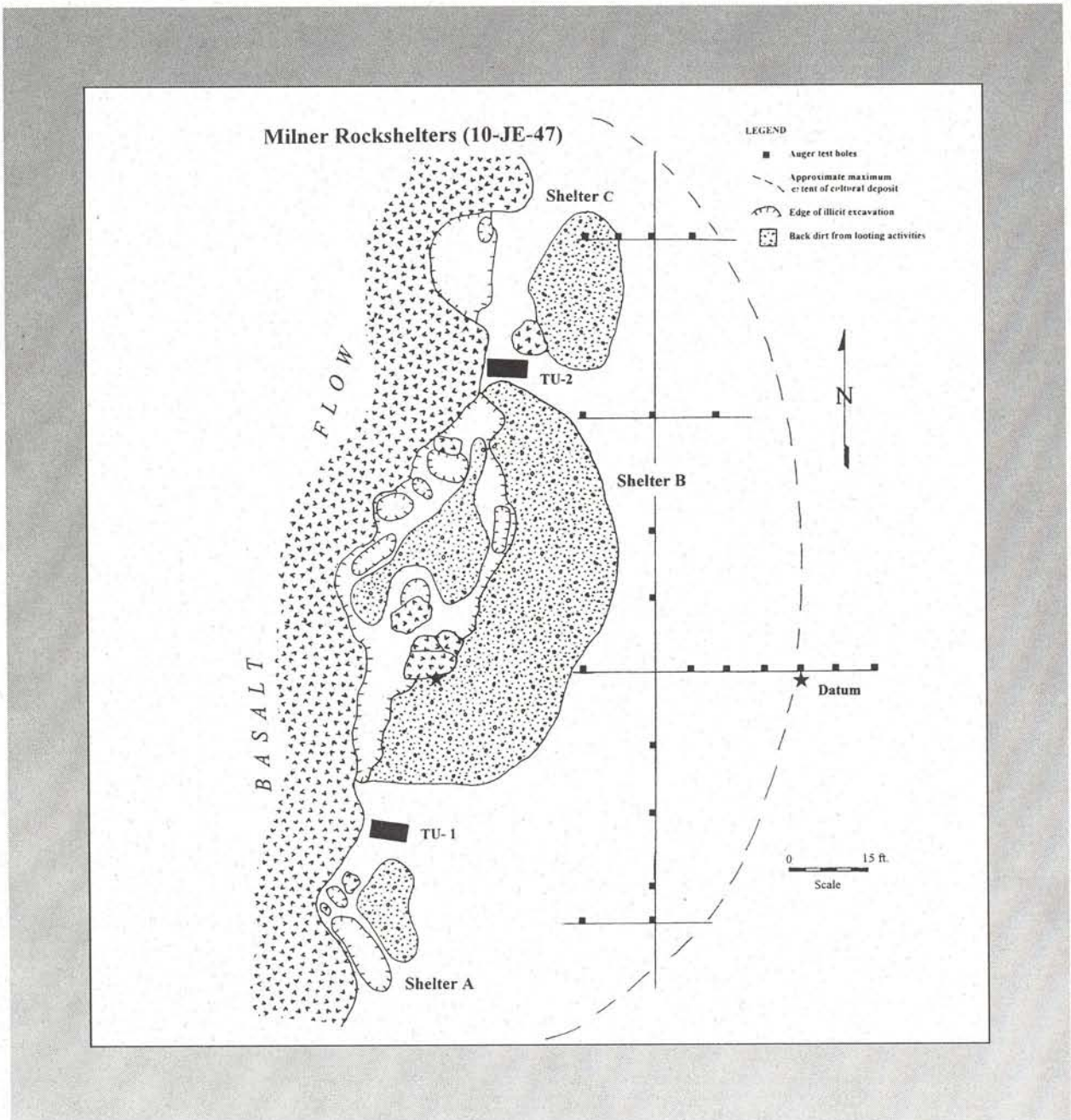

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Cover Photo: Plan map of Milner Rockshelters. Outlines of the overhang of the shelters have been omitted to more clearly illustrate the looter pits.

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ARTICLES AND REPORTS

ARCHAEOLOGICAL INVESTIGATIONS AT MILNER ROCKSHELTER (10-JE-47), SOUTHERN IDAHO

Robert M. Yohe II

INTRODUCTION

At the request of the Special Agent in Charge (SAC), the Idaho State Office of the Bureau of Land Management (BLM) and the Office of the U. S. Attorney, the Office of the State Archaeologist (Idaho State Historical Society) participated in the investigations pertaining to an Archaeological Resources Protection Act (ARPA) violation of an archaeological site in the Shoshone District of the BLM. The author (who was the State Archaeologist at the time) and his staff assisted the SAC and the BLM Shoshone District Archaeologist (Suzann Henrikson) in the field evaluation and test excavations of the Milner Site (10-JE-47), which consisted of three rockshelters and an associated midden just north of the Snake River near Milner Dam, west of Burley, Idaho (Fig. 1). The objectives of the test excavations were to: (1) determine the nature and vertical/horizontal extent of the prehistoric cultural deposit at the site; and (2) evaluate with respect to its eligibility for inclusion in the National Register of Historic Places (NRHP). A determination of eligibility was critical to pursuing the ARPA case, because if the site was determined ineligible (due to massive destruction of the subsurface components of the site), the strength of the ARPA case would be diminished. The report that follows presents the results of the test excavations and the various analyses of materials recovered.

SITE DESCRIPTIONS

The Milner site consists of three rockshelters or overhangs beneath a basalt flow on the north side of the Snake River, approximately one mile northwest of Milner Dam and an eighth of a mile from the river. The surrounding environment is comprised of the sagebrush steppe typical of most of the Snake River Plain of southern Idaho, with the dominant plant form being *Artemisia tridentata*. The rockshelters, designated A, B, and C, run along the base of a basalt escarpment for a distance totaling nearly 165 ft. (50 m.) (Fig. 2). Shelter A is the smallest of the three, measuring 20 feet (6 m.) wide and approximately 10 feet (3 m.) in depth. Shelter B, the largest, is 75 feet (23 m.)wide and 15 feet (4.6 m.) deep at its deepest point. The third shelter, Shelter C, is 20 feet (6 m.) wide and 15 feet (4.6 m.) deep.

The site was first recorded in 1980 by Thomas Green, the Idaho State Archaeologist at the time, who stated that the site "appears eligible for nomination to the National Register. . . (t)he size, depth, quantity of artifacts makes it difficult to argue otherwise" (Green 1980). Green noted the presence of manos, metates, mortars, and projectile points, in addition to flakes and faunal remains on the surface of the site. Some looting was noted at the time, and Green expressed concern regarding future looting.

In 1992, Suzann Henrikson, an archaeologist of the Shoshone District BLM, conducted a site vandalism investigation at 10-JE-47 (Henrikson 1992). Numerous artifacts were noted on the surface and in backdirt piles from various illicit excavations. Henrikson also noted that based on the variety and abundance of artifacts the site met the criteria for eligibility for nomination to the NRHP.

During the test excavations conducted at the site in July of 1998, all three of the rockshelters were noted as having been severely impacted, the interiors of all three completely destroyed due to the action of illegal excavations (Fig. 3). Few artifacts or ecofacts were noted on the surface beyond the shelters, but were apparent in the back dirt piles in the form of lithic flakes, ground stone fragments, animal bone, and fire-cracked rock.

FIELD METHODS

As noted above, the main objective of this field investigation was to determine both the nature and extent of the archaeological deposit at Milner Rockshelter which would, in turn, allow for a determination of both scientific significance and an estimation of the level of site damage. This required the determination of vertical and horizontal boundaries of the cultural deposit. Because of both time and budgetary constraints, formal test excavation units were limited to two 1 x 2 m. test pits at two locations separated by approximately 25 m. (75 ft.). These excavation units were placed in two of the only places near the face of the basalt flow that had not been disturbed by extensive looter activity, between Shelters A

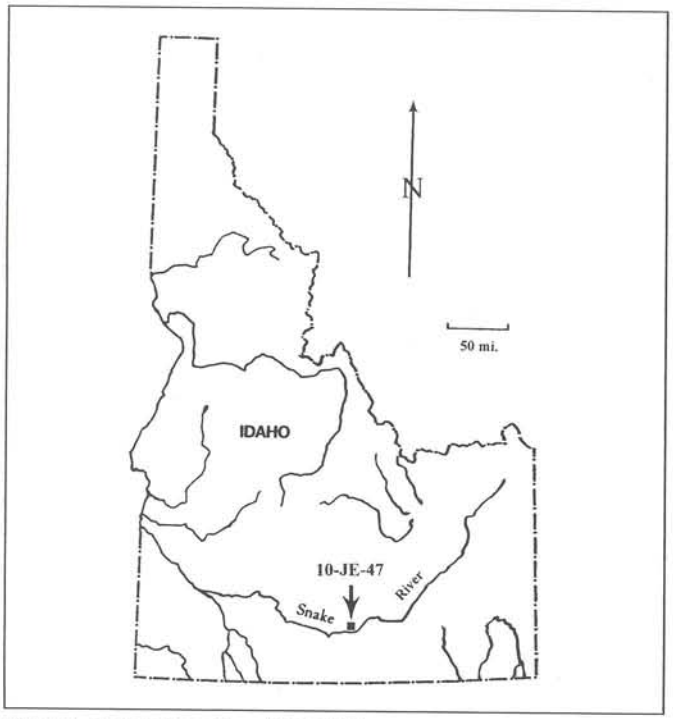


Figure 1. General location of 10-JE-47.

and C (Fig. 4). The southernmost unit, Test Unit 1 (TU-1), was established between two major looter pits in Shelters A and B in a less sheltered area not covered by the basalt overhang. Test Unit 2 (TU-2) was placed west of TU-1 in between the main (Shelter B) and smaller auxiliary shelter (Shelter C). Excavations were conducted in arbitrary 10 cm. levels initially in TU-1, but artifact yields were low enough and time for field work was limited, so 20 cm. levels were implemented until Feature 2 (a biface cache) was encountered. The excavation of all of TU-2 was conducted in 20 cm. levels to a depth of 80 cm., below which levels were abandoned and shovel excavations continued to a depth of 150 cm. A dark soil stain was discovered at this level, along with artifacts. The south half of the unit was excavated to 172 cm. until all traces of the dark soils were no longer visible. All soils were screened through 1/8 in. hardware mesh. Collected

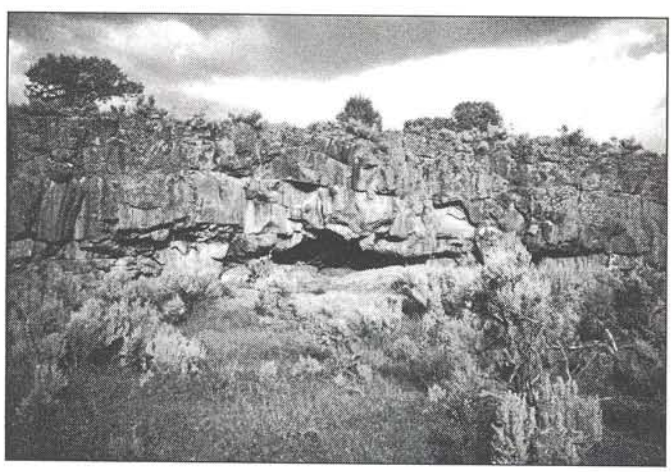


Figure 2. Milner Rockshelters (10-JE-47), view west. Note large mound of back dirt from illegal excavations in front of Shelter B (center).

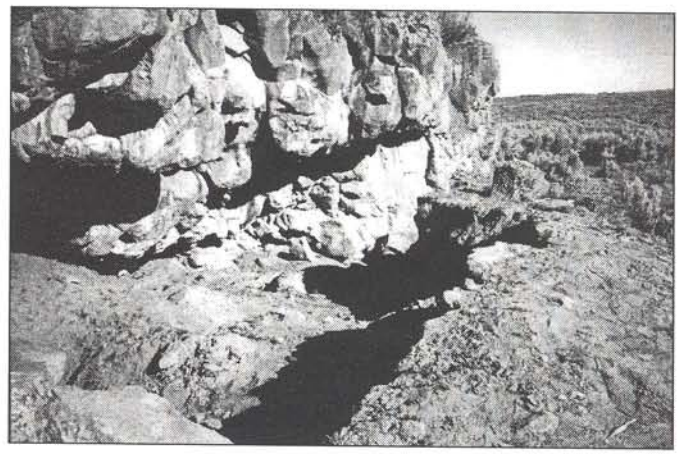


Figure 3. Shelter B, view north. Note depth of illicit excavation within and directly in front of the shelter.

artifacts and ecofacts were bagged by level within each test excavation unit for transport back to the laboratory.

A baseline and metric grid was established for the purpose of conducting archaeological auger testing east of the shelter to determine the horizontal extent of the archaeological deposit. The primary datum was established 20 m. east of the original site datum on a boulder at the opening of Shelter B. A north/south axis was laid out eight meters west of the primary datum (8W) in two-meter increments for the purpose of the auger testing (Fig. 5). The auguring tool employed was a hand auger with a 10 cm. diameter cup with a 2-meter handle. Each auger sample was taken in 10 cm. increments to a depth of at least 1 m. All soils were passed through 1/8 in. hardware mesh, and recovered artifacts were recorded by auger hole and level.

STRATIGRAPHY

The archaeological deposit at 10-JE-47 consisted of five primary strata that were similar in their particle composition (poorly sorted very fine sand with subangular coarse sands), but differing primarily in their organic content and, hence, Munsell color values. The stratigraphic profile in Fig. 5 is representative of the soils noted in both TU-1 and TU-2, although the clarity of the stratigraphic divisions was less obvious (especially in Stratum C) in TU-2 than in TU-1. The more homogeneous nature of the soil in the TU-2 profile may be the result of the less intensive use or discard behavior at this particular spot by the prehistoric inhabitants of the site (this is further suggested by the fewer and less diverse artifacts recovered from TU-2). However, a dark organic stain (Munsell value 10YR 2/2) approximately 15 cm. thick was noted first at 150 cm., but was limited to the west half of the unit.

Stratum A appeared to be disturbed midden soil, possibly resulting from cattle and human trampling, and perhaps some degree of past illicit raking by artifact collectors. However, the darkest anthropogenic soils were limited to the upper 70 cm. of the cultural deposit, or all of Stratum C (Munsell value 10YR 4/2), which appears to have been formed over the last 2,500 years

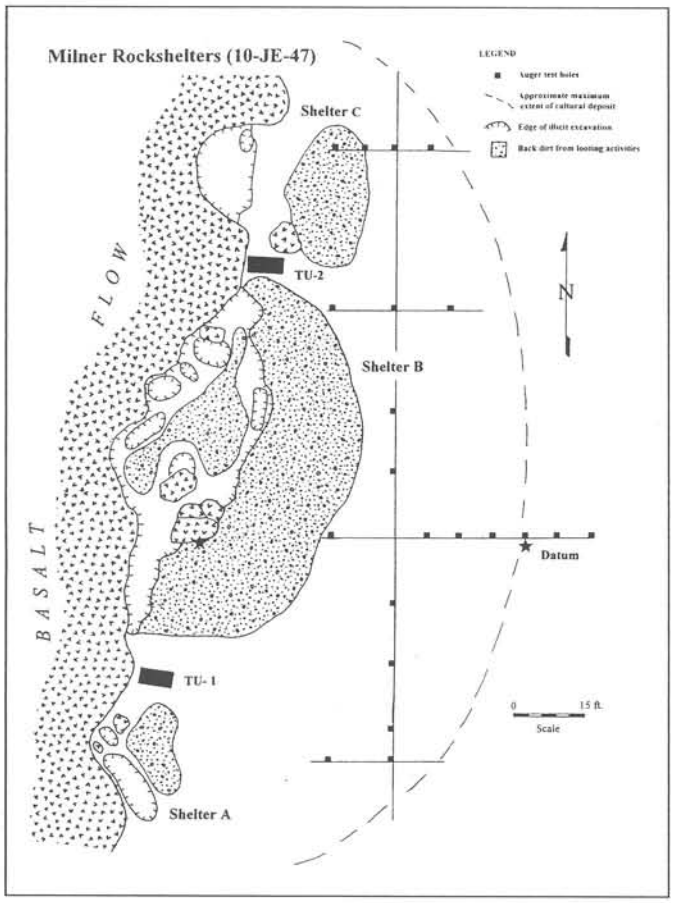


Figure 4. Plan map of Milner Rockshelters. Outlines of the overhang of the shelters have been omitted to more clearly illustrate the looter pits.

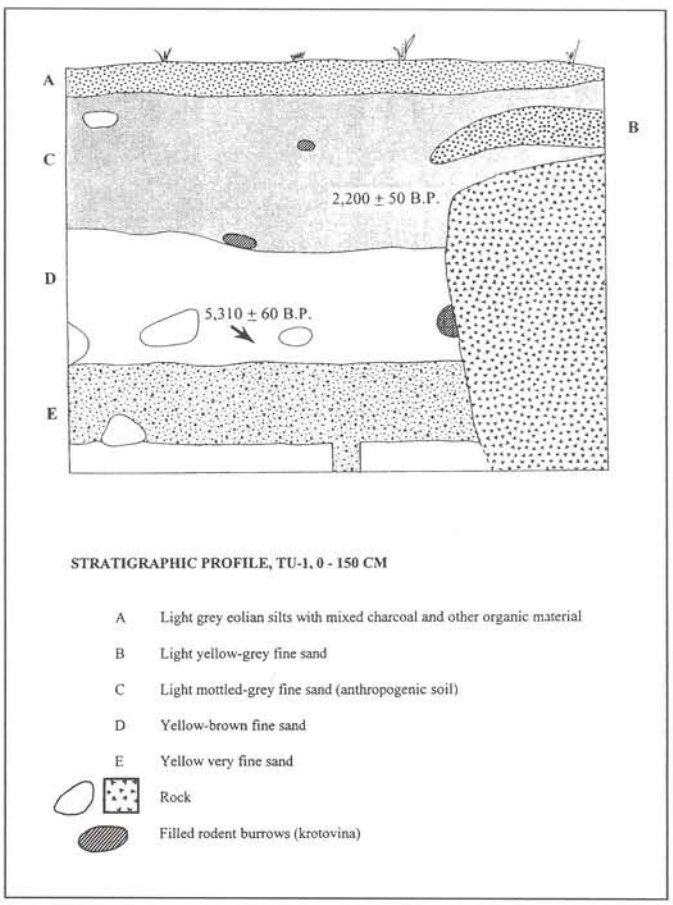


Figure 5. TU-1, south wall stratigraphic profile.

based on radiometric analyses from unit TU-1 (see below). Stratum D is lighter in color (Munsell value 10YR 5/3), and continues to a depth of 120 cm. The bottom of this stratum dates to approximately 5,300 years B.P., based on the radiometric assessment of a fragmentary pronghorn mandible recovered from the base of this layer. Artifact density and soil coloration correspondingly diminish in Stratum E (Munsell value 10YR 6/3) to a depth of 220 cm., at which point the soil terminates on bedrock.

The cultural deposit within Shelter B may have been deeper than 2 m. prior to the extreme looting activities within the shelter. On the other hand, based on the examination of the bottom of the illicit excavation in the overhang, the soil within Shelter C appears to end at approximately 1 m. when bedrock is encountered.

CHRONOLOGY

Sufficient organic materials were recovered to allow for radiometric analysis on two stratigraphically separated samples. Both samples were from TU-1, one from a depth of 50 cm. and another from 115 cm. The first sample consisted of fine charcoal and organic soils from a hearth feature (Feature 1; see description below) in the southwest end of the unit, which dated to 2,200 +/- 50 B.P. (Beta-119621) near the bottom of Stratum C. A fragmentary pronghorn antelope (*Antilocapra americana*) mandible provided the material for the second sample from near the bottom of Stratum D, dating to 5,310 +/- 60 B.P. (Beta-119622). These dates appear to be consistent with the presence of stemmed bifurcate (indented base) points from both units at depths of 50 to 120 cm. (see Holmer 1986).

A crude lanceolate point or biface from 150 cm. in TU-2 is suggestive of a Haskett point, which range in age from 9,000 to 10,000 B.P. (Butler 1965, Sargeant 1973). Another Haskett point, believed to be an "heirloom" item, was recovered from Feature 2, although it is possible that it could have been collected at this site during some later occupation period in prehistory. Other cultural materials from deep in the deposit appear to be minimal at the site, suggesting sparse use of 10-JE-47 this early in time in relation to later years.

FEATURES

Two features, both in TU-1, were identified during the test excavations at 10-JE-47. The first feature, designated as Feature 1 (Fig. 6), consisted of a small hearth occurring between 30 and 50 cm. in depth. The hearth was ovate in form, measured 30 x 40 cm., and contained micro-fine charcoal and dark soil. This charcoal and soil was used to obtain a radiocarbon date of 2,200 B.P. (see above for discussion). A flotation sample was collected from the edge of the feature for future analysis.

The second feature, Feature 2 (Fig. 7), consisted of a cache pit containing eight bifaces and two large cryptocrystalline flakes at 90 to 120 cm. in depth. Two ign-

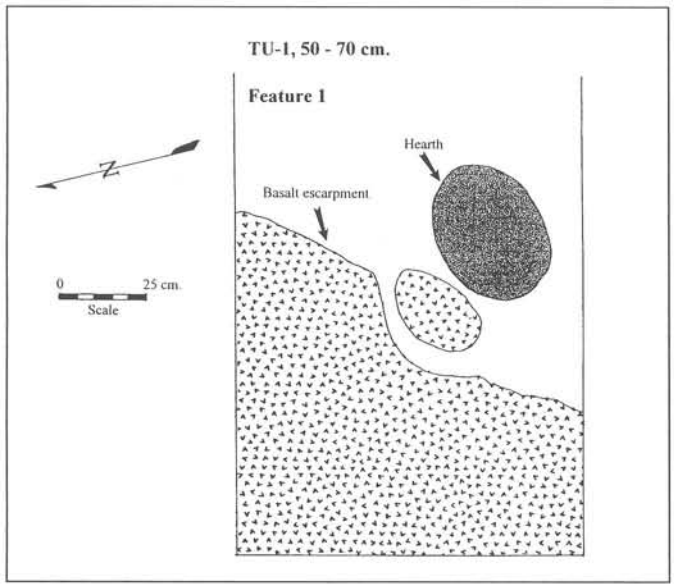


Figure 6. Feature 1, TU-1.

imbrite bifaces were recovered in the screen before a formal feature was recognized. The pit was located in a small alcove up against the basaltic bedrock that filled the western one-third of the unit, with dimensions approximately 40 x 60 cm. in diameter and 40 cm. in depth. The pit feature may have been rock covered originally, as there were several large basaltic cobbles just east of the feature.

ARTIFACT ANALYSES

A total of 1,190 prehistoric artifacts, including debitage, was recovered during the test excavations at 10-JE-47 (Table 1). An additional 12 artifacts, primarily ground stone, were collected from the surface of the large back dirt pile in front of Shelter B.

TABLE 1

ARTIFACT TYPES BY TEST UNIT, 10-JE-47			
ARTIFACT	**TU-1**	**TU-2**	**TOTAL**
Projectile points	5	2	7
Bifaces	13	2	15
Unifaces/flake tools	2	1	3
Debitage	720	433	1,153
Potsherds	5	1	6
Groundstone	--	5	5
Bone awl	1	--	1
TOTAL	746	444	1,190

HISTORIC ARTIFACTS

A small number of recent historic artifacts were recovered during the excavation in the upper 20 cm. of the deposit, except for a small piece of dark, pliable plastic found at the 120-130 cm. level of TU-1. In TU-1, these objects included aluminum foil, rim-fire .22 shells (2), a .40-.60 rifle cartridge case ("W.R. A. Co./40-60"), a clay pigeon fragment from 0-10 cm., and a fiberglass cigarette filter from 10-20 cm. In TU-2, all the items came from the 0-20 cm. level and include one bottle cap and two .22 shells. Such items are consistent with modern recreational use of the area for hunting and target practice. All of these historic artifacts (except for the .40-.60 rifle cartridge) appear to date to within the past 50 years.

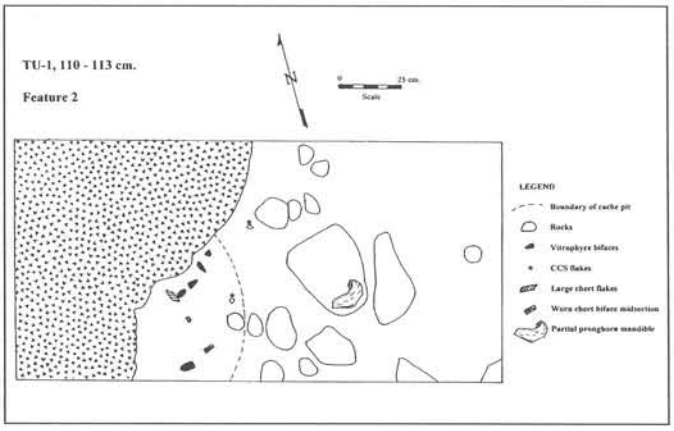


Figure 7. Feature 2, TU-1.

The .40-.60 rifle cartridge case is of interest since it is the oldest historic artifact in the collection. This cartridge, along with the .40-.60 rifle, was produced by Winchester Repeating Arms Company from 1876 to 1897 (Barnes 1965). The rifle was so popular that the cartridge was produced until 1934 (ibid). It is unlikely that this gun was used by Shoshone or Bannock peoples at the site since both tribes had been forcefully captured by military expeditions throughout southern Idaho beginning in 1866 and placed on the Fort Hall reservation in 1869 (Neitzel 1998). However, it may indicate early Euro-American recreational use of the rockshelters as a staging area for hunting activities.

FLAKED STONE ARTIFACTS

Projectile Points

Six projectile points were found during testing. Four of the points were recovered from TU-1 and two from TU-2. The attributes of these artifacts can be found in Table 2, and a photograph of these specimens can be seen in

Figure 8. Projectile points and assorted bifaces, 10-JE-47. Top row, left to right: Eastgate point (10-JE-47-91); three preforms (10-JE-47-2, -1, -15). Bottom row, left to right: Elko earred (10-JE-47-14); three Pinto bifurcate stemmed points (10-JE-47-42, -145, -90). Large bifaces to right, left to right: Haskett (10-JE-47-147); an indented base, haftable scraper (10-JE-47-22).

Figure 8. The most common material for the points is obsidian. The types of projectile points represented are typical of those found at other archaeological sites dating to the past 10,000 years in the Great Basin. The only incongruous vertical disposition of a point in the deposit is the presence of an Eastgate arrow point at 120-130 cm. in TU-1, below the 5,300 B.P. radiocarbon date. The vertical and horizontal displacement of artifacts is commonly believed to be the result of bioturbation by burrowing rodents, the evidence of which is clear at this site in the soil profile of TU-1 (see Fig. 5).

Interestingly, all of the indented-base stemmed points are broken and exhibit evidence of impact fractures, suggestive of discarded broken points from dart foreshafts retrieved from the field following hunting activities.

In addition to the complete or, at least, diagnostic projectile point specimens, three small projectile point fragments were identified, two from TU-2 (10-JE-47-151, -152) and one from TU-1 (10-JE-47-4) (Fig. 9). Both specimens from TU-2 are partial midsections of finely pressure-flaked small points (likely arrow points) from the upper 80 cm. of the deposit. The fragment from TU-1 appears to be the corner of a triangular base, the thickness of which indicates an arrow point. The attributes of these artifacts are provided in Table 2.

A biface recovered from Feature 2 in TU-1 is made of tan chert and reminiscent of an early Holocene lanceolate point, such as a Haskett. This specimen is much more finely flaked than the Haskett point from TU-2, and exhibits evidence of long-term handling (curation?), since all of the arrises and sharp edges are smooth. This artifact might have been picked up off the surface of another site and kept by a person or persons until it was buried with the cache. An illustration of this artifact can be seen in Figure 10.

Bifaces

The bifaces found at 10-JE-47 that are not attributed to the status of projectile points are all apparently projectile point or bifacial tool blanks or preforms. The one exception to this categorization is an indented-base biface with a rounded but sharp scraping edge that is interpreted as

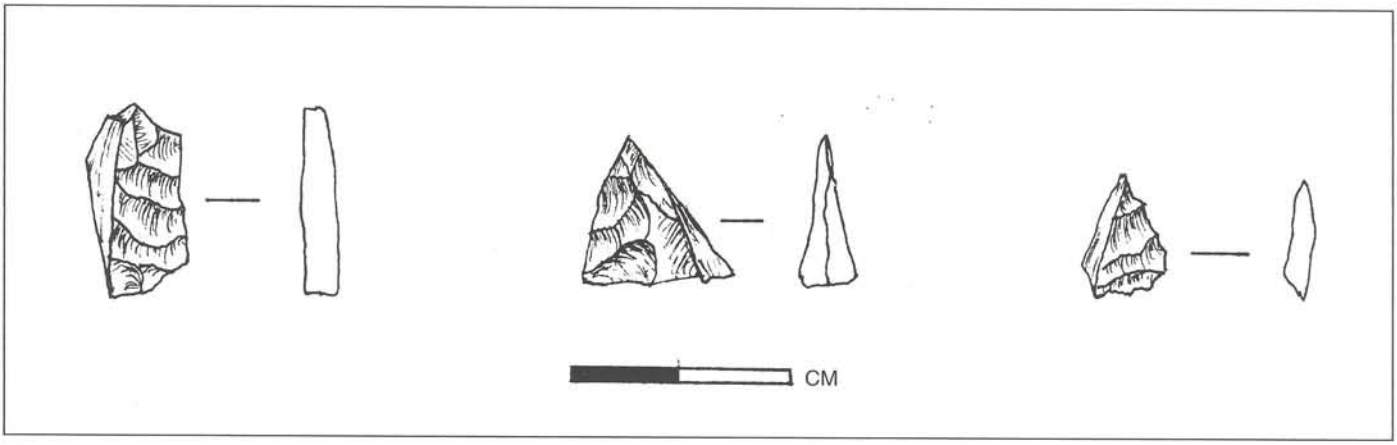


Figure 9. Obsidian projectile point fragments, left to right: 10-JE-47-151, -152, -4.

TABLE 2

PROJECTILE POINTS AND PREFORMS, 10-JE-47 TEST EXCAVATIONS, 1998 (IN MM.)

Cat. No.	Unit	Level	Type	Material	Length	Width	Thickness	NW**	BW***	Wt.
10-JE-47-1	TU-1	0-10	preform	chert	—	19.2	5.0	—	—	2.8*
10-JE-47-2	TU-1	0-10	preform	obsidian	—	17.9	3.6	—	—	1.5*
10-JE-47-14	TU-1	10-20	Elko-Earred?	ignimbrite	41.5*	22.0	4.5	1.4	B	3.0*
10-JE-47-15	TU-1	10-20	preform	obsidian	40.0	19.8	7.7	—	—	5.3
10-JE-47-22	TU-1	20-30	scraper?	chert	50.2	24.2	9.8	—	15.6	12.5
10-JE-47-42	TU-1	50-70	Pinto	obsidian	33.7*	21.0	6.1	16.3	16.9	4.8*
10-JE-47-145	TU-2	58	Pinto	obsidian	28.1*	18.3*	5.5	11.6	12.4	2.7*
10-JE-47-90	TU-1	120-130	Pinto	obsidian	27.2*	17.6	4.9	10.8	11.0	2.2
10-JE-47-91	TU-1	120-130	Eastgate	obsidian	24.0	17.0*	2.9	6.0	6.7	0.9
10-JE-47-147	TU-2	151	Haskett	rhyolite	72.8	24.7	9.5	—	—	14.5
10-JE-47-72	TU-1	115	Haskett	chert	45.7*	22.0	8.1	—	—	8.9*
10-JE-47-4	TU-1	0-10	point frag.	ignimbrite	—	—	2.9	—	—	0.1*
10-JE-47-151	TU-2	20-40	point frag.	obsidian	—	—	3.4	—	—	0.7*
10-JE-47-152	TU-2	60-80	point frag.	obsidian	—	—	4.6	—	—	0.5*

*incomplete measurements **neck width ***base width

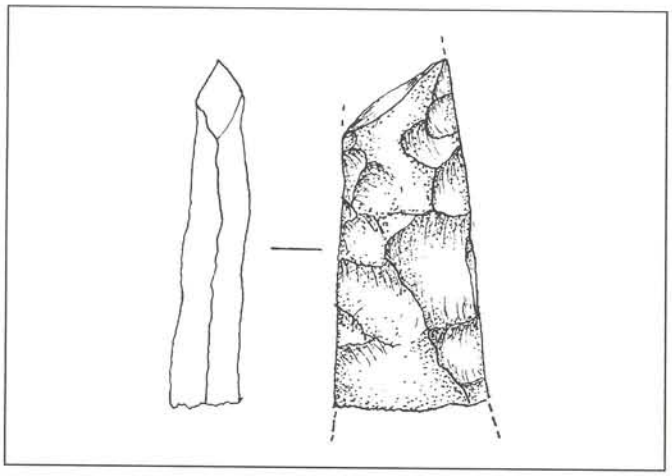


Figure 10. Haskett midsection (10-JE-47-72) from Feature 2. Actual size.

being a hafted scraper (10-JE-47-22). Several pressure-flaked arrow point preforms were recovered from TU-1, and eight bifacial blanks or preforms were recovered from a cache pit from Feature 2. Each grouping is described separately below.

Pressure-flaked preforms. Three pressure-flaked preforms (10-JE-47-1 ,-2, -15), all from the top 20 cm. of the archaeological deposit, comprise the artifacts in this category. Each can be seen in Figure 8 and the metric attributes for these preforms are found in Table 2. The relatively small size of each specimen and their presence in the upper portions of the cultural deposit suggest they were intended as preforms for arrow points. 10-JE-47-1 and -2, both from the 0-10 cm. level of TU-1, are broken across the midsection. This damage likely occurred during the manufacturing process, resulting in their discard into the deposit. The third specimen (10-JE-47-15), from the 10-20 cm. level of TU-1, appears to be a preform that may have been discarded because of its great thickness, making it unsuitable for notching or easy hafting.

Blanks/percussion preforms. In the cache pit designated Feature 2 in TU-1, seven vitrophyre bifacial percussion blanks and preforms and one curated biface midsection of tan chert were recovered. The degree of work on each ovate specimen varies from very minimal flaking (10-JE-47-73, -79) to extremely fine percussive workmanship (10-JE-47-81). The metric attributes of these artifacts can be found in Table 3 and can be seen in Fig. 11. These bifaces are very similar to others recovered from similar caches at other archaeological sites along the Snake River (see discussion below).

Figure 11. Ignimbrite bifaces from Feature 2, TU-1, top row, left to right: 10-JE-47-79, -77, -75. Bottom row: 10-JE-47-78, -73, -76. Far right: 10-JE-47-81.

TABLE 3

ATTRIBUTES OF VITROPHYRE BIFACES FROM CACHE IN TU-1, 10-JE-47 (IN MM.)

Catalog No.	Length	Width	Thickness	Weight (g.)
10-JE-47-73	45.9	31.4	7.8	11.5
10-JE-47-75	45.0	24.9	7.9	9.0
10-JE-47-76	59.1	32.2	7.8	18.2
10-JE-47-77	37.2	26.5	6.7	7.5
10-JE-47-78	48.7	28.5	7.1	10.4
10-JE-47-79	39.0	26.5	7.0	6.8
10-JE-47-81	75.0	33.0	8.7	24.5

Bifacial scraper. A single indented-base bifacial artifact of pink-white-red variegated chert was recovered from the 20-30 cm. level of TU-1. The semicircular distal end with a slight bevel along with the indented base suggests that this artifact was hafted and used as a scraper. This attribution of function is also supported by immunological analysis that detected rabbit proteins along the distal edge. Its attributes are recorded in Table 2, and it can be seen in Fig. 8.

Large chert biface fragment. The proximal end of a large chert biface (10-JE-47-134) was identified from the 60 - 80 cm. level of TU-2. This biface fragment is 78.8 x 31.2 x 15.1 mm. in size and weighs 43.0 g. An illustration of this artifact can be seen in Figure 12.

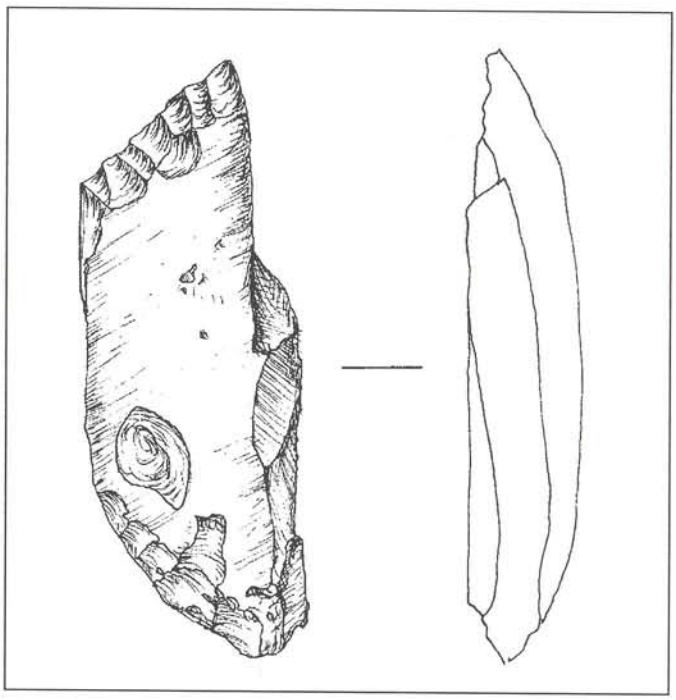


Figure 12. Chert biface fragment (10-JE-47-134). Actual size.

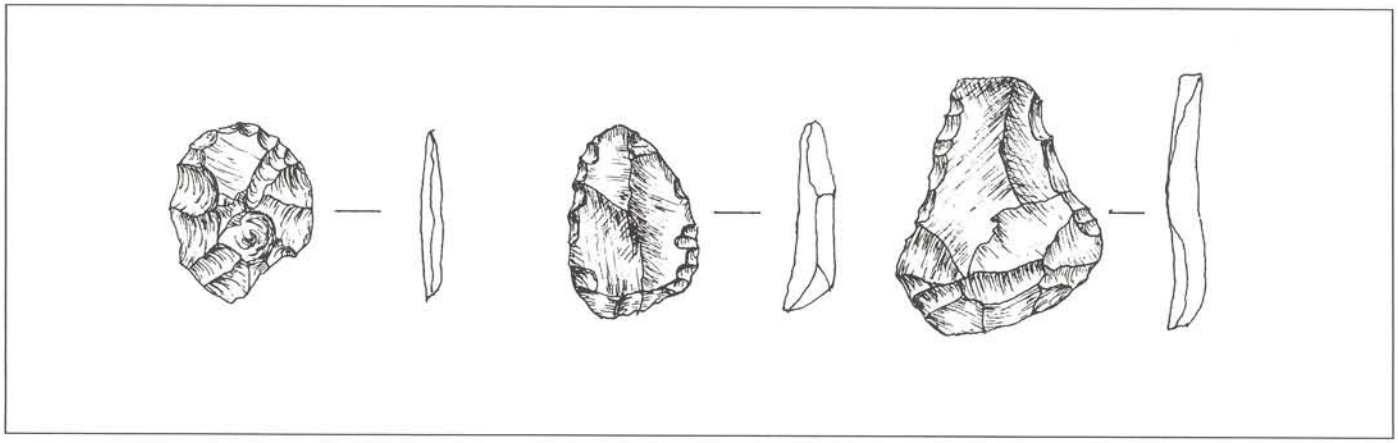


Figure 13. Chert unifaces, left to right: 10-JE-47-13, -3, -115. Scale approximately 1:1.

Unifaces

A total of three unifacial tools, all small scrapers, were recovered from the top 20 cm. of the cultural deposit. Both are made from cryptocrystalline material. The first, from the 0-10 cm. level in TU-1 (10-JE-47-3), is made on a small flake of dark brown chert measuring 24.8 x 17.3 x 5.5 mm. and weighing 2.4 g. The second (10-JE-47-13), from the 10-20 cm. level in the same unit, is a unifacially worked white chert flake measuring 20.6 x 20.0 x 3.5 mm. and weighing 1.4 g. A third specimen (10-JE-47-115) is made from brown chert and measures 33.3 x 28.4 x 3.9 mm. Each is illustrated in Fig. 13.

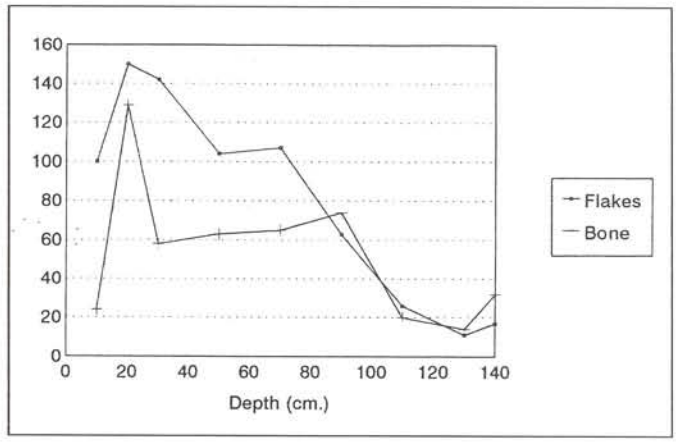
Immunological analysis for trace proteins was conducted on the small chert scraper from the 0-10 cm. level of TU-1 (10-JE-47-3) and the scraper from the same unit, 10-20 cm. (10-JE-47-13). Tested against a suite of antisera produced from 10 major mammalian taxa, only 10-JE-47-3 produced a positive reading for deer.

Debitage

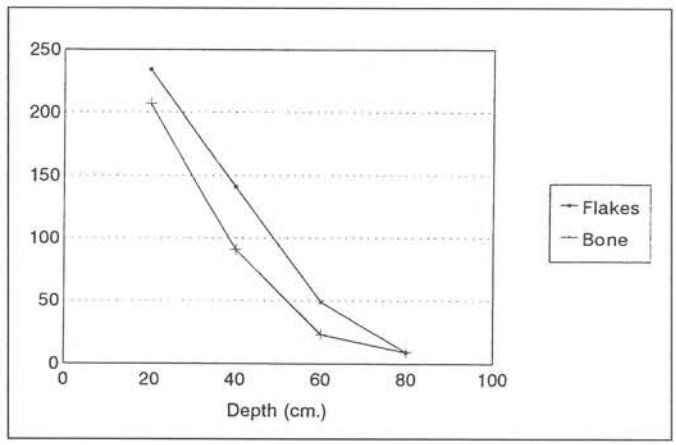
A total of 1,318 flakes was recovered during the test excavations, the majority from TU-1. Most of these flakes occurred in the upper 80 cm. of the cultural deposit, which is consistent with the general artifact distribution and midden soil coloration. The vertical distribution of the debitage roughly correlates with the abundance of vertebrate faunal remains as shown in Figures 14 and 15. The majority of the flakes are vitrophyres (obsidian or ignimbrite) (83.5%), followed by cryptocrystalline (15.3%), basalt (0.9%), and quartzite (0.008%). A breakdown of the vertical distribution of the debitage by unit is provided in Tables 4 and 5.

The technological attributes of the debitage assemblage suggests the reduction of small golfball-to-tennisball-size ignimbrite cobbles, based on the fairly common occurrence of cortical cobble fragments and the cortical flakes in general (3% to 10% in the upper levels of TU-1). This contention is further supported by the generally small size of the vitrophyric debitage (<3 cm.) and the presence of at least two bipolar flakes. In contrast, none of the cryptocrystalline flakes bears any trace of cortex. Additional clarification of the reduction strategy may be possible through a complete technological analysis of the flake assemblage at some point in the future.

VERTICAL DISTRIBUTION OF FLAKES AND BONE,TU-1



VERTICAL DISTRIBUTION OF FLAKES AND BONE, TU-2



Figures 14 and 15. Vertical distribution of flakes and bone, by number in TU-1 (top) and TU-2 (bottom).

GROUND STONE ARTIFACTS

A total of 16 ground stone artifacts was collected from 10-JE-47. During the field work at the site, several ground stone artifacts were noted on the surface of the looter back dirt pile in front of Shelter B. These articles apparently were exhumed during the illicit excavations within the shelter and were tossed out as waste. In furthering the effort to more completely characterize the

TABLE 4

DEBITAGE MATERIAL TYPE BY LEVEL, TU-1					
Level	Obsidian/ Vitrophyre/ Ignimbrite	Red	CCS	Basalt	Quartzite
0-10	74	2	17	2	--
10-20	115	2	33	1	1
20-30	111	7	30	--	--
30-50	83	6	15	--	--
50-70	94	1	9	--	--
70-90	48	2	12	2	--
90-110	20	--	4	--	--
110-120	11	--	--	--	--
120-130	6	--	3	--	1
130-140	12	--	--	--	--
140-150	6	--	--	--	--
TOTAL	580	20	123	5	2

TABLE 5

DEBITAGE MATERIAL TYPE BY LEVEL, TU-2					
Level	Obsidian/ Vitrophyre/ Ignimbrite	Red	CCS	Basalt	Quartzite
0-20	229	3	54	2	1
20-40	119	1	21	3	--
40-60	97	--	1	2	--
60-80	43	--	3	--	--
80-173	9	--	--	--	--
TOTAL	497	4	79	7	1

extent and nature of the prehistoric occupation of this archaeological site, these ground stone artifacts were collected for analysis. An additional four ground stone specimens were recovered from the test excavations in TU-2. All of these ground stone artifacts are described below.

Surface Collected Ground Stone

A total of twelve ground stone artifacts was collected from the large spoil pile of dirt and fire-affected rock immediately adjacent to the large looter pit within Shelter B. These include one pestle fragment, two complete manos, six fragmentary manos, two unidentified ground stone fragments, and one metate fragment. A brief description of each category is provided below.

Pestle fragment. One pestle fragment (10-JE-47-155S) was identified among the surface collection. It appears to be the proximal or handle end of the pestle with uniform polish on most surfaces. It is made of quartzite and is slightly triangular in cross-section. The specimen is 50.5 x 54.1 x 40.0 mm. in size. An illustration of this specimen can be seen in Figure 16a.

Handstones or Manos. Three complete and five fragmentary manos were collected from the surface of the Shelter B back dirt pile. All but one (10-JE-47-153) are made from hand-sized, vesicular basalt cobbles. The one quartzite mano fragment is the only purposefully shaped (manufactured) piece of ground stone in the collection, exhibiting the classic "bar of soap" shape (see Fig. 16b). Only two of the manos have unifacial grinding surfaces, the remaining handstones are bifacial. Of the cobble

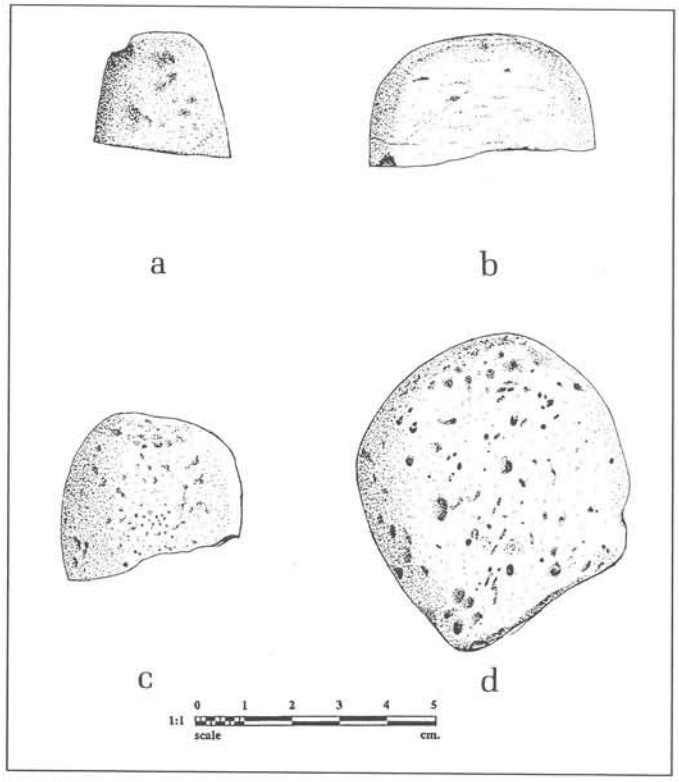


Figure 16. Pestle and manos from the surface collection, 10-JE-47: (a) pestle (10-JE-47-155), (b) mano fragment (10-JE-47-153); (c) mano fragment (10-JE-47-158); (d) unifacial mano (10-JE-47-162). Scale approximately 1:2.

manos, only one (10-JE-47-154) is particularly amorphous. Metric attributes of these artifacts can be found in Table 6 and illustrations of a representative sample of the handstones in the surface collection can be seen in Figure 16.

Metate. A single, large milling stone fragment (10-JE-47-164) is included in the Milner Rockshelter surface collection. The slab, like most of the handstones, is comprised of local vesicular basalt. It appears to be the midsection of a metate with a reconstructed grinding surface of approximately 12 cm. in diameter, although much of the surface exhibits some polish. The specimen measures 24.5 x 68.3 x 67.4 cm. in size, and can be seen in Figure 17.

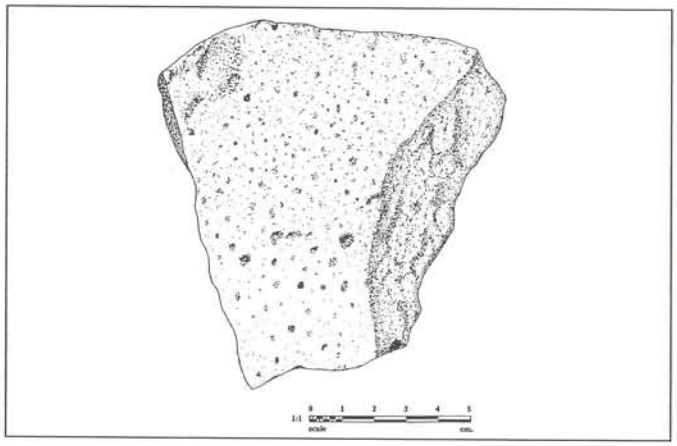


Figure 17. Partial milling platform (metate) of vesicular basalt (10-JE-47-164) from surface collection, 10-JE-47. Scale is approximately 1:2.

TABLE 6

METRIC ATTRIBUTES OF SURFACE COLLECTED HANDSTONES AT MILNER ROCKSHELTERS (10-JE-47)					
Cat. No.	Material	Length	Width	Thickness	Weight (g)
10-JE-47-153	quartzite	89.1	54.3	36.6	262.6
10-JE-47-154	basalt	119.6	94.1	56.6	857.3
10-JE-47-157	basalt	143.5	121.5	73.9	1,680.8
10-JE-47-158	basalt	89.8	90.7	59.4	649.7
10-JE-47-159	basalt	89.9	89.0	54.5	441.4
10-JE-47-160	basalt	114.3	85.6	48.1	661.5
10-JE-47-161	basalt	138.5	94.6	63.8	1,161.4
10-JE-47-162	basalt	165.5	138.4	46.5	1,272.7

Unidentified ground stone artifacts. Two specimens are classified as unidentified ground stone artifacts, since their functional attributes are unclear. One artifact (10-JE-47-156) is an amorphous, tabular fragment that exhibits bifacial polish and may have functioned as a handstone. Another specimen (10-JE-47-163) is a large (172.1 x 163.6 x 57.8 mm.) basalt cobble with polished high spots on its flatter side; it may have functioned as a small milling platform.

Subsurface Ground Stone

Manos. Three artifacts identified as manos (handstones) were all found in TU-2 at varying depths. 10-JE-47-132, from the 40-60 cm. level, is a unifacial mano fragment of vesicular basalt that measures 89.0 x 74.0 x 50.7 mm. and weighs 451 g. The second specimen is from 60-80 cm. and is a small bifacial mano (10-JE-47-136) of vesicular basalt measuring 85.0 x 56.7 x 38.5 mm and weighing 279 g. The deepest specimen was found associated with the dark stain in the west half of the unit at 151 cm. in depth. It is a large, amorphous, unifacial mano (10-JE-47-148) of vesicular basalt measuring 195.0 x 108.5 x 42.7 mm. and weighing 1,058 g.

Immunological analysis of a mano from TU-2 (10-JE-47-132) provided negative results against a suite of animal antisera (see second article, this journal). A new study of other ground stone specimens from this unit and the surface collection in front of Shelter B in order to test for various plant protein residues is currently underway.

Pestle fragment. A single pestle fragment (10-JE-47-112) comes from the 20-40 cm. level of TU-2. It is composed of vesicular basalt and measures 39.8 x 26.9 x 14.6 mm., and weighs 18.4 g. Based on the profile of this specimen, it was a cylindrical pestle approximately 4 cm. in diameter.

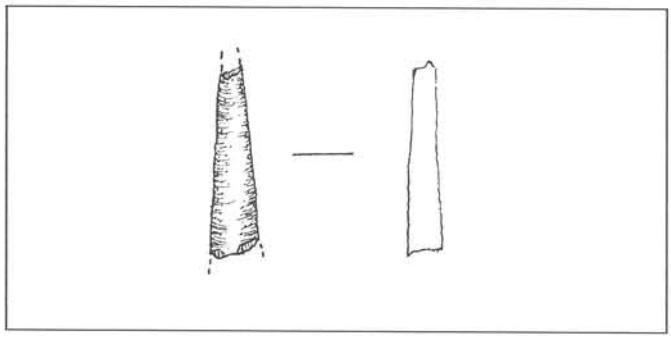


Figure 18. Bone awl fragment from TU-1 (10-JE-47-32). Actual size.

Discussion

Although ground stone artifacts recovered from the recent excavations were limited to TU-2, numerous specimens were observed and collected from the looter's back dirt from Shelter B. The common occurrence of this artifact category in the cultural deposit of Shelter B, coupled with the pestle and handstone fragments found in TU-2, suggest that floral (and other) food processing activities were common at 10-JE-47.

CERAMIC ARTIFACTS

Pottery Fragments

A total of six small pottery sherds were found during the testing, all but one from TU-1. In TU-1, the sherds were found distributed between 0 and 50 cm., and in TU-2 the one specimen found occurred in the 10–20 cm. level. All are undecorated brownware body sherds with natural temper and are consistent with Butler's (1986) "generic basin" or Shoshonean ware.

The presence of these few sherds indicate use of the site into the Late Prehistoric Period, or within the last 300 to 500 years (Butler 1986).

BONE ARTIFACTS

Bone Awl

A single bone awl (Fig. 18) was recovered from the 30–50 cm. level in TU-1. It appears to be an upper awl midshaft with the tip missing, and is made from a splinter of large mammal long bone shaft. It measures 25.4 x 6.6 x 4.9 mm and weighs 0.6 g.

MISCELLANEOUS ARTIFACTS

Polished Stone

A single, polished cobble measuring 42.0 x 28.8 x 19.0 mm. and weighing 29.4 g. was found inside the cache pit of Feature 2 in TU-1. It exhibits dark staining along one edge.

FAUNAL REMAINS

A total of 831 extremely fragmentary vertebrate faunal remains was recovered from both test excavation units. Abundance measured both by number and weight (Figs. 14, 15, and 19), along with the other artifactual and soil indicators, suggest that the greatest period of occupation and use of the site took place in the upper 80 cm. of the deposit, or approximately the last 2,000 years. Nearly one-fifth of the faunal assemblage exhibits evidence of thermal alteration (19.6%). The faunal assemblage is

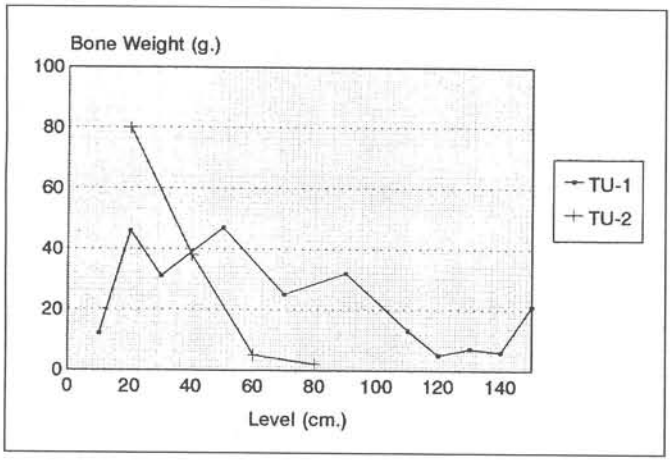


Figure 19. Vertical distribution of bone by weight, 10-JE-47.

dominated by nondiagnostic, large mammal long bone fragments (75.1% of all bone) which, given the identified ungulates from the sites, are likely representative of deer (*Odocoileus* sp.), bison *(Bison bison)*, and pronghorn antelope *(Antilocapra americana)*. Based on bone fragments found in the back dirt piles of the numerous illicit excavations at 10-JE-47 (especially in front of Shelter B), it seems that other large artiodactyls, such as bighorn sheep *(Ovis canadensis)* and elk *(Cervus canadensis)*, may also have been processed and consumed at the site. Surprisingly, small mammals, such as hares (*Lepus* sp.), cottontails (*Sylvilagus* sp.), and rodents are poorly represented in the faunal assemblage. In spite of the proximity of the rockshelters to the Snake River, no fish remains of any type were identified. Tables 7 and 8 provide a list of identified animals from each test unit.

Although no clear butchering marks were noted on any of the bone fragments, one specimen of large mammal long bone shaft fragment from the 70-90 cm. level in TU-1 shows clear evidence of carnivore gnawing, likely that of a canid given the diameter of the tooth marks.

The predominance of fragmentary large vertebrate remains suggests that bovids and cervids common to the Snake River Plain in prehistory would have been the most frequently consumed animal protein at 10-JE-47, based on the current evidence.

SUMMARY AND DISCUSSION

It is obvious when one sees the concerted efforts expended by looters at 10-JE-47 that this site has proven to be very rich in evidence of past human occupation. The BLM/SHPO test excavation project of 1998 further confirmed the archaeological significance of the site by demonstrating several thousands of years of human use of these rockshelters. The greatest intensity of this use appears to have been within the past 2,000 years, but a 5,300 B.P. date and the presence of a Haskett point at 40 cm. below the oldest dated level suggest a human presence at the site for as many as 10,000 years. Artifact types, including projectile points, pottery fragments, scrapers, a bone awl, milling implements, and debitage suggest a wide range of activities, including hunting, weapon maintenance, storage, hide processing, basket making, processing of vegetal resources, and stone tool manufacturing. Features 1 and 2 indicate the use of at least one non-rock-lined hearth and caching behavior. An analysis of the flaked stone artifacts and debitage show a preference for obsidian and ignimbrite as tool stone, much of which may have been produced from small cobbles at the site. Animal bones from the archaeological deposit indicate that large mammals were the greatest contributors of animal protein to the diet, with minimal contributions made by other vertebrate taxa. An interesting lack of fish remains and fishing-related artifacts (net sinkers, bone hooks, etc.) with the site being so near the Snake River is noted.

FUTURE WORK

Although much of the significant information that might have been yielded by this archaeological site has been severely compromised by the profound level of past looting activities within the shelters, the outlying cultural deposit has been shown to harbor additional important data pertinent to Idaho prehistory.

Research questions that can still be addressed by the archaeological information believed to exist at 10-JE-47 include:

1. What changes in vertebrate exploitation occurred in this region of the Snake River Plain over the last 10,000 years? Is there evidence of significant differ-

TABLE 7

VERTEBRATE REMAINS FROM TU-1, 10-JE-47

Taxon	0-10	10-20	20-30	30-50	50-70	70-90	90-110	110-120	120-130	130-140	TOTAL
Lepus sp.	1	1	--	--	--	--	--	--	--	--	2
Sylvilagus sp.	--	--	--	--	--	--	--	--	--	1	1
Leporid	--	--	--	--	--	--	--	--	--	--	--
Marmota sp.	--	--	--	--	1	--	--	--	--	--	1
Unident. rodent	--	--	--	--	2	1	--	--	1	2	6
Odocoileus sp.	1	--	--	--	--	--	--	--	--	--	1
Ovis canadensis	--	--	--	1	--	--	--	--	--	--	1
Antilocapra americana	--	--	--	--	--	--	--	2	--	--	2
Artiodactyl	--	8	12	7	17	6	1	--	2	2	55
small mammal unident.	1	4	3	--	--	--	--	--	--	--	8
large mammal unident.	22	116	43	55	45	67	19	12	18	27	424
TOTAL	25	129	58	63	65	74	20	14	21	32	501

TABLE 8

VERTEBRATE REMAINS FROM TU-2, 10-JE-47						
Taxon	**0-20**	**20-40**	**40-60**	**60-80**	**80-172**	**TOTAL**
Lepus sp.	--	--	--	--	--	--
Sylvilagus sp.	--	2	--	--	--	2
Leporid	2	1	--	--	--	3
Unident. rodent	1	--	--	--	--	1
Artiodactyl	76	36	5	4	--	121
Small mammal	--	1	3	--	--	4
Large mammal	128	51	15	5	1	200
TOTAL	207	91	23	9	1	331

ences in faunal resource focus based on major climatic shifts (mesic vs. xeric conditions), or technological innovation (introduction of the bow and arrow)?

The abundance of vertebrate faunal materials preserved at Milner Rockshelters makes this site a good candidate for future studies about changes in faunal resource use for most of the time humans have inhabited southern Idaho. This is one of the few *long-term* habitation sites to be examined on this part of the Snake River Plain. Using a vigorous sampling strategy, sufficient remains could be recovered to gain additional insight into any major shifts in usage of any particular species that may have taken place as a result of various possible impeti (climatic changes, introduction of the bow and arrow, etc.).

2. Do the archaeological data from 10-JE-47 support Plew's (1990) proposed alternative models for late prehistoric subsistence strategies on the Middle Snake River?

Plew (1990) suggests that the importance of stored salmon as a winter resource for the prehistoric inhabitants of southern Idaho post–A.D. 1200 may not have been as great as assumed based on the greater optimality of camas collection and storage compared to salmon capture and processing. He further suggests that other terrestrial faunal resources, such as deer and bison, would provide greater caloric return for less energy investment. The rich late prehistoric record at this site may provide additional data to either support or refute this contention. Such data could be derived through flotation recovery of botanical remains, studies of additional vertebrate faunal materials, and the immunological analysis of residues for milling implements.

3. Were there significant changes in the types of lithic resource materials that were exploited in the region over the last few thousands of years? Have the use of vitrophyre sources been consistent over time?

Holmer (1997) has shown that numerous vitrophyre sources exist throughout southern and eastern Idaho, all of which were used by prehistoric peoples. By studying a sufficient vertical sample of vitrophyric materials from 10-JE-47, considerable additional knowledge could be gained concerning the use of these and perhaps other unknown sources through time.

4. How do the caching behaviors exhibited at 10-JE-47 compare regionally?

The ignimbrite biface cache (Feature 2) recovered from TU-1 bears similarities to other caches found near American Falls (Pavesic 1966), Lower Rock Creek (Plew and Woods 1986), and eastern Oregon (Weide and Weide 1969). Additional caches may exist at this site that would allow for a more robust assessment of age and function, since many of the other caches that have been examined do not have directly associated radiocarbon assessments and have been assumed to be related to the Western Idaho Archaic Burial Complex (WIABC) (Pavesic 1985), which is believed to date between 4,000 and 6,000 B.P. The cache identified from 10-JE-47 is associated with a date of 5,300 B.P., which is consistent with the presumed WIABC association.

5. Is there evidence (artifactual or otherwise) to suggest significant prehistoric population movements/displacement or evidence of trade over time in southern Idaho?

Following the notion of a recent migration of Numic-speaking peoples into the Great Basin originally proposed by the linguist Lamb (1958) and built upon by many anthropologists (Grosscup 1960, Hopkins 1965, Miller 1966, Goss 1968, Butler 1981, Nichols 1981, Bettinger and Baumhoff 1982, Fowler 1983, Holmer 1986, Sutton 1986, 1987), the question has often been posed as to the presence of "ethnic markers" that could clearly indicate new immigrants to the area. Such marker artifacts of the Numa may include small side-notched arrow points and ceramics, and perhaps "Wahmuza knives" (Holmer 1986). Other population movements, such as incursions by Plateau peoples from the northwest, are suggested by various artifacts recovered from the Rattlesnake Canyon Rockshelter site (Bonnichsen 1961). Butler (1981) argues for a Fremont presence in southern Idaho prior to the Numic expansion based on both ceramic artifacts and Fremont-style pictographs from various sites. Elements of the WIABC intimate connections, either ideologically or physically, with Midwestern cultures (Pavesic 1985). Any artifact-rich, deeply stratified archaeological deposit, such as 10-JE-47, has the potential to address issues of population movements, trade, and diffusion of cultural elements.

Beyond these basic research questions, it is very likely that additional questions would result from unanticipated data that would be amassed from any further professional archaeological investigations at this site.

The archaeological deposits at the Milner Rockshelters have been severely compromised by voluminous and catastrophic looting activities in recent years. The amount of significant information about the prehistory of southern Idaho that has been lost due to this atrocity

exceeds monetary value. What is certain is that science and the citizens of Idaho will never be able to benefit from the full story this site could have told about our past due to this senseless destruction. However, the limited archaeological investigations at this site clearly establish the richness of the archaeological deposit peripheral to the major activity areas within the rockshelters, which still have the potential to yield information useful in addressing the above research questions.

POSTSCRIPT

The result of the investigations by the Bureau of Land Management determined that one of the main perpetrators of the damage to 10-JE-47 was Jerry Lee Young, part-owner and operator of the Idaho Heritage Museum in Hollister, Idaho (which is now closed). In 2001 Mr. Young pleaded guilty to one felony charge stemming from the violation of the Archaeological Resources Protection Act of 1979.

ACKNOWLEDGMENTS

I thank A. Daniel Hughes, former SAC for Idaho BLM, for his faith in my expertise and allowing me to be a party to this important ARPA investigation; Suzann Henrikson for her energy and enthusiasm, as well as for bringing me into this investigation; the 1998 field team, consisting of Mary Anne Davis, Norm Henrikson, Suzann Henrikson, Suzi Neitzel, and Jeff Ross; Jill Gardner for her editorial assistance; and Ray Leicht, Boise Bureau of Reclamation for both moral and financial support.

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SHORT CONTRIBUTIONS

IMMUNOLOGICAL ANALYSIS OF LITHIC ARTIFACTS FROM SITE 10-JE-47 AND KINZIE BUTTE, IDAHO

Margaret E. Newman

INTRODUCTION

Research carried out by scientists in Europe and North America in recent years clearly show that organic residues recovered from lithics, ceramics, coprolites, and soils can be identified through the use of chemical and molecular biological techniques. Although these techniques are used with confidence in the 'hard sciences,' their application to archaeology is relatively new and, as such, there are still problem areas that need to be resolved (Thomas 1993). However, it is clear that data obtained by the use of these modes of analysis can provide unique insight into the evolution of animals and humans, prehistoric environments, prehistoric diet and subsistence, and tool function–information that cannot be obtained by other means.

Doubts have recently been expressed concerning the preservation, viability and identification of ancient protein materials (Eisele 1995; Fiedel 1996). However, the evidence clearly demonstrates that, not only are proteins extremely hardy molecules, but they can be identified through the use of molecular biological and chemical modes of analyses (Newman et al. 1996; Newman et al. 1997). Proteins have been recovered from shells of planktonic foraminifera dating between 2 and 4Ka BP (Robbins and Brew 1990), from dinosaur bones (Miller and Wyckoff 1968) and dinosaur eggs (Voss-Foucart 1968), from frozen mammoth dated ca. 40,000 BP (Prager et al. 1980), and from 1,500-year-old bones (Cattaneo et al. 1992). A recent immunological study of 4,000-year-old bone from an Egyptian mummy dated to 2150 +/- 50 BC shows that bone alkaline phosphatase was still viable although the mummy had been embalmed (Weser et al. 1995). Although proteins may not be preserved in their tertiary form, linear epitopes are generally conserved which can be identified by Western blot and other immunological methods (Abbas et al. 1994). Given the viability of proteins under the conditions discussed, there is a high probability that artifacts used in hunting, butchering, plant collection and processing will also retain adequate amounts of detectable protein.

In criminal investigations stains are obtained from a variety of sources–clothing, metal, plaster, cement and other materials. Moreover, criminals habitually endeavor to remove bloodstains by such means as laundering, scrubbing with bleach, etc., yet such degraded samples are still identified by immunological methods (Lee and De Forest 1976; Milgrom and Campbell 1964; Shinomiya et al. 1978, among others). Although DNA analysis is now used in many forensic laboratories some form of proteinaceous material is required for such testing. Forensic wildlife laboratories use immunological techniques in their investigation of hunting violations and illegal trade, often from contaminated evidence (Bartlett and Davidson 1992; Guglich et al. 1994; Mardini 1984; McClymont et al. 1982; among others). Immunological methods are also used to test the purity of food products such as canned luncheon meat and sausage, products that have undergone considerable degradation (Ashoor et al. 1988; Berger et al. 1988; King 1984). Thus the age and degradation of protein does not preclude detection (Gaensslen 1983:225).

Immunological methods have been used to identify plant and animal residues on flaked and groundstone lithic artifacts (Allen et al. 1995; Gerlach et al. 1996; Hyland et al. 1990; Kooyman et al. 1992; Newman 1990, 1995; Petraglia et al. 1996; Yohe et al. 1991) and in Chumash paint pigment (Scott et al. 1996). Plant and animal residues on ceramic artifacts have been identified through the use of gas-liquid chromatography, high performance liquid chromatography and mass spectrometry (Bonfield and Heron 1995; Evershed et al. 1992; Heron et al. 1991; Patrick et al. 1985), while serological methods have been used to determine blood groups in skeletal and soft tissue remains (Heglar 1972; Lee et al. 1989) and in the detection of hemoglobin from 4,500-year-old bones (Ascenzi et al. 1985). Human leukocyte antigen (HLA) and deoxyribonucleic acid (DNA) determinations made on human and animal skeletal and soft tissue remains have demonstrated genetic relationships and molecular evolutionary distances (Hänni et al. 1995; Hansen and Gurtler 1983; Lowenstein 1985, 1986; Pääbo 1985, 1986, 1989; Pääbo et al. 1989). Recent studies have also shown that it is possible to detect DNA

in ancient wheat and radish seeds (Brown et al. 1995; O'Donoghue et al. 1995), providing the potential for evolutionary studies of plant domesticates.

Materials and Methods

The method of analysis is cross-over electrophoresis (CIEP). Minor adaptations to the original method were made following procedures used by the Royal Canadian Mounted Police Serology Laboratory, Ottawa (1983) and the Centre of Forensic Sciences (Toronto). Although this test is not as sensitive as radio-immunoassay (RIA), it has a long history of use in forensic laboratories, does not require expensive equipment, is reasonably rapid and lends itself to the processing of multiple samples (Culliford 1964). The assay is performed in agarose gels with a pH of 8.6. Paired wells, approximately 1.5 mm in diameter and 5 mm apart are punched in an 80 x 100 mm agarose gel. The *antigen* (unknown extract) is placed in the cathodic well of the pair and the *antibody* or antiserum in the anodic one. The gel is placed in an electrophoresis tank containing a barbital buffer, pH 8.6, and triple thicknesses of filter paper are used as wicks to connect the ends of the slides with the buffer. Electrophoresis is carried out for 45 minutes at a constant 100v. In this assay the pH of the gel is set at pH 8.6 to render the immunoglobulin free of charge so as not to move in the electric field. This allows for the antibody to diffuse from the antibody as well as the antigen is electrophoresed toward the antibody diffusion front. If the unknown sample contains protein corresponding to the species antiserum against which it is being tested, an extended lattice forms as a result of cross-linking and a precipitate forms where they reach equivalence concentrations between the two wells. Weak positive reactions, common in archaeological samples, are more readily observed if the gel is dried and stained with a protein stain, such as Coomassie Blue. Appropriate positive and negative controls, prepared in 5% ammonia solution, are run with each gel. These are: **positive**–blood species being tested for e.g., deer blood for deer antiserum and **negative**–blood of species in which antiserum is raised e.g., rabbit if raised in that animal. *Duplicate testing is carried out on all positive results.*

Washes taken from nine artifacts from Milner Rockshelter (10-JE-47), and one from a metate recovered from Kinzie Butte Playa, Idaho, were submitted for potential identification of animal and plant protein residues by immunological analysis. No control soil samples were sent for analysis. As contaminants in soils may result in false positive precipitation of antisera, it is important that site soils are always included in the analysis. Samples were concentrated by lyophilization then reconstituted by the addition of 200µl of sterile phosphate-buffered-saline (PBS). Initial testing of samples was carried out against pre-immune serum (i.e., serum from a non-immunized animal). A positive result against pre-immune serum could arise from non-specific protein interaction not based on the immunological specificity of the antibody (i.e., nonspecific precipitation). No positive reaction was obtained and further testing was continued against the antisera shown in Tables 1 and 2.

TABLE 1. ANIMAL ANTISERA USED IN ANALYSIS

ANTISERA TO:	SOURCE
Bear	Organon Teknika
Bovine	"
Cat	"
Chicken	"
Deer	"
Dog	"
Guinea-Pig	"
Rabbit	"
Rat	"
Sheep	"
Trout	University of Calgary
Shrimp	"

TABLE 2: PLANT ANTISERA USED IN ANALYSIS

ANTISERA TO:	SOURCE
Amarantheaceae	University of Calgary
Camas	"
Capparadaceae	"
Chenopodiaceae	"
Compositeae	"
Gramineae	"
Malvaceae	"

Antisera obtained from commercial sources are developed specifically for use in forensic medicine and, when necessary, these sera are solid phase absorbed to eliminate species cross-reactivity. However, these antisera recognize epitopes shared by closely related species and will often identify other species within the individual family. Plant antisera, raised against extracts from modern species, provide family level identification only. The relationship of animal antisera used to potential prey species identified is shown in Table 3.

TABLE 3. RELATIONSHIP OF ANIMALS TO ANTISERA USED IN ANALYSIS

ANTISERA	MOST PROBABLE SPECIES
Bear	Black, Grizzly
Bovine	Bison, Cow
Cat	Bobcat, Lynx, Mountain Lion, Cat
Chicken	Chicken, Turkey, Quail, Grouse, Pheasant
Deer	Deer (all species), Elk, Moose, Caribou, Pronghorn
Dog	Coyote, Wolf, Dog, Fox
Guinea-Pig	Porcupine, Squirrel, Beaver, Guinea-Pig
Rabbit	Rabbit, Hare, Pika
Rat	Rat (all species), Mouse (all species)
Sheep	Sheep, Goat

Results

The results obtained in this analysis are shown in Table 4 and discussed below.

A positive reaction to deer antiserum was obtained on one artifact, a chert scraper (#1), from Milner Rockshelter. As shown in Table 4, any member of the

Cervidae family may be represented by this result but cross-reactions with other, unrelated species do not occur with this antiserum.

One positive reaction to rabbit antiserum was found on a large chert scraper (#4). As shown in Table 3, any member of the order Lagomorpha may be represented by these results. Cross-reactions to other, unrelated families do not occur with this antiserum.

No other positive reactions were found in this analysis. The absence of identifiable proteins on artifacts may be due to poor preservation of protein or that they were used on species other than those encompassed by the antisera. It is also possible that the artifacts were not utilized.

TABLE 4. RESULTS OF CIEP ANALYSIS

Catalog #	Artifact Type	Result
1	Chert Scraper	Deer
2	Chalcedony Scraper	Negative
3	Notched Point	Negative
4	Large Scraper	Rabbit
5	Stemmed Point	Negative
6	Groundstone	Negative
7	Metate	Negative
8	Mano	Negative
9	Mano	Negative
10	Metate	Negative

Concordance with 10-JE-47 artifact catalogue:

(1) 10-JE-47-3
(2) 10-JE-47-13
(3) 10-JE-47-14
(4) 10-JE-47-22
(5) 10-JE-47-145
(6) 10-JE-47-136
(7) *Not from 10-JE-47*
(8) 10-JE-47-132
(9) 10-JE-47-162
(10) 10-JE-47-164

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