NEVADA Archaeologist

Volume 6, Number 2, 1988

Flaked obsidian artifact from the Smoke Creek Desert
(see article by P. Hutchinson, page 26).

Nevada Archaeological Association

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The design for the NAA logo was adapted by Robert Elston from a Garfield Flat petroglyph.

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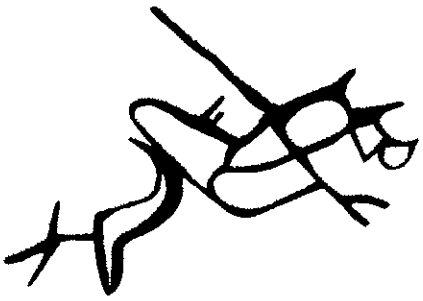
FUTURE ISSUES

Manuscripts submitted to the *Nevada Archaeologist* should follow the style guide of the January, 1979 issue of *American Antiquity*. Manuscripts should be typed and double spaced throughout, including notes and bibliography, and illustrations should be camera-ready with a caption typed on a separate sheet of paper, also double-spaced. Something less than these standards will be accepted reluctantly if what you have to say is more important than the format expressed above.

More manuscripts relating to Nevada archaeology and anthropology, in general, are solicited.



NEVADA Archaeologist

Volume 6, Number 2 **1988**

EDITOR'S NOTE

In Volume 6, Number 1, the *Nevada Archaeologist* published the text of a paper presented at the 1984 Great Basin Meetings. The paper was entitled "Paleoenvironmental and Archeological Implications of Early Holocene – Late Pleistocene Cave Deposits from Winnemucca Lake, Nevada" (pages 34-38). Robert Thompson, the senior author, has pointed out an error in the abstract. The TAMS date on the Fishbone Cave horse bone is incorrectly stated as 12,800 B.P. The correct date can be found later in the paper (page 36, column 2, paragraph 3), as 12,280 ± 520 B.P. He would also like to give more credit to the efforts of Dr. Thomas W. Safford (then of the University of Arizona, now of the Carnegie Institute) and the personnel of the Tandem-Accelerator Mass Spectrometry radiocarbon dating facility at the University of Arizona. Their contributions were essential to the study.

The *Nevada Archaeologist* regrets the error and the oversight.

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THE 1987 ARCHEOLOGICAL FIELDWORK AT HANDPRINT CAVE, NEVADA

Ruth Gruhn and Alan Bryan
University of Alberta

Location and Description of the Site

Handprint Cave (26HU1836) is located in northwestern Nevada. The entrance of the cave affords a high lookout, with a large part of the Black Rock Desert in full view. Altimeter readings indicate an elevation of approximately 1346 meters or 4416 feet at the entrance to the cave, which is situated at the base of a limestone cliff. Directly below this cliff, a very steep talus slope descends to the level of the expansive alkali flat of the Black Rock Desert, at an approximate elevation of 1220 meters or 4000 feet. The highest known level of Pleistocene Lake Lahontan, at approximately 1330 meters or 4362 feet (Benson and Thompson 1987), is about 16 meters or 55 feet below the entrance of the cave. At no time was the cave flooded by the Pleistocene Lake. Thus, it was reasoned that evidence of Pleistocene human occupation might be found preserved in early deposits.

At the entrance to the cave is a relatively small rockshelter, measuring approximately 8 meters long north-south by 6 meters deep east-west, formed by the smoothly curving roof and walls of a former chamber of the cavern (Fig. 1a). The roof and walls are jointed and fractured. The surface of the fill, sloping down towards the rear of the shelter, was covered by rock fragments in silt, with large angular boulders embedded in or resting upon the fill. There was little evidence of recent disturbance in the entrance shelter.

Behind a very large boulder in the northeast part of the entrance shelter is the narrow entrance to the present cavern, with a steep irregular route of 18 meters length descending five meters over a massive high flowstone-coated rockfall to an extensive area of silt fill with some rock rubble and much debris of packrat midden (small twigs and dung) on its surface.

The cavern is impressive, with a gabled roof rising an estimated 10 meters over the surface of the silt fill. The area of the silt fill measured approximately 17.5 meters north-south by 12 meters east-west, with a surface sloping down from north to south, and steep cones of silt and packrat midden banked against the flowstone-coated zones of rockfall (Fig. 1b). Parts of the silt fill area were recently excavated by bat guano prospectors or arrowhead collectors. Beyond the area of silt fill is another high massive flowstone formation, and beyond and above this flowstone formation are two very small chambers with some silt fill. Bone fragments observed in these small chambers suggest use as animal lairs, although there is no passable rear entrance to the cavern.

In the main chamber of the cavern near the south wall is a large stalagmitic column which had split along its length. On a light smooth surface on the east side of the column is a cluster of about a dozen ovoid smudges of bright red ochre, each roughly about 10 x 12 cm in diameter. Human handprints can also

FIGURE 1

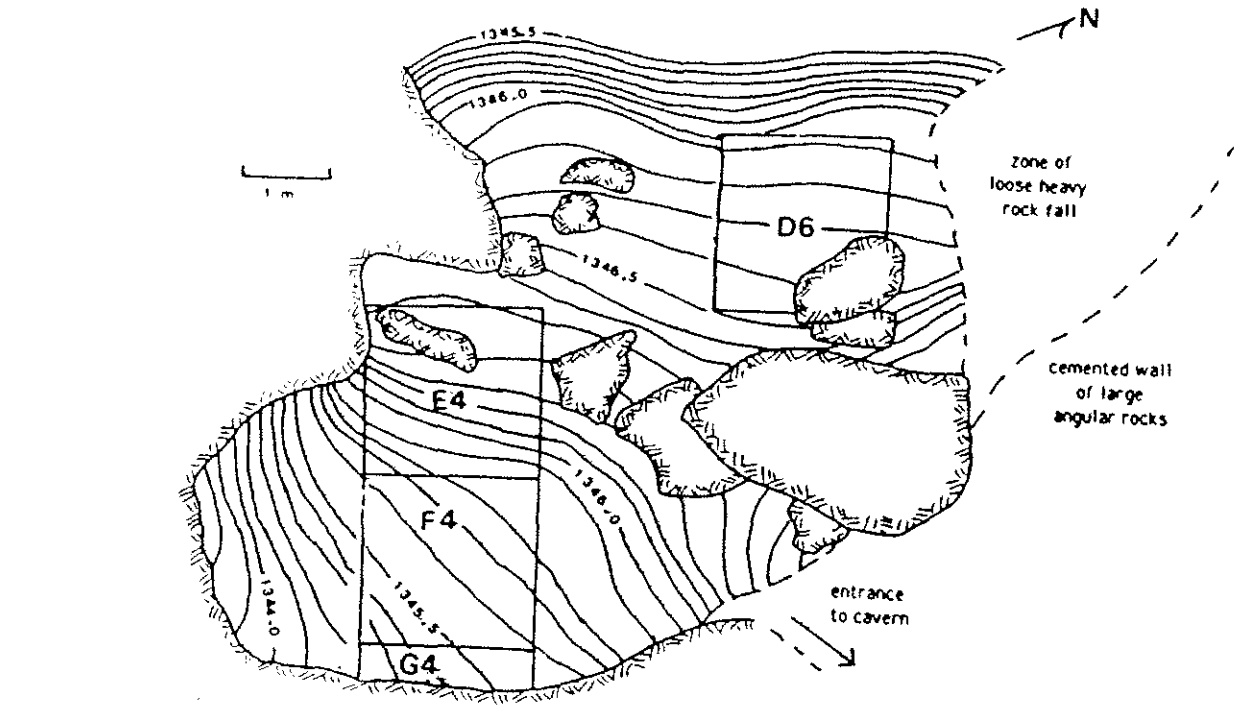


Fig 1a

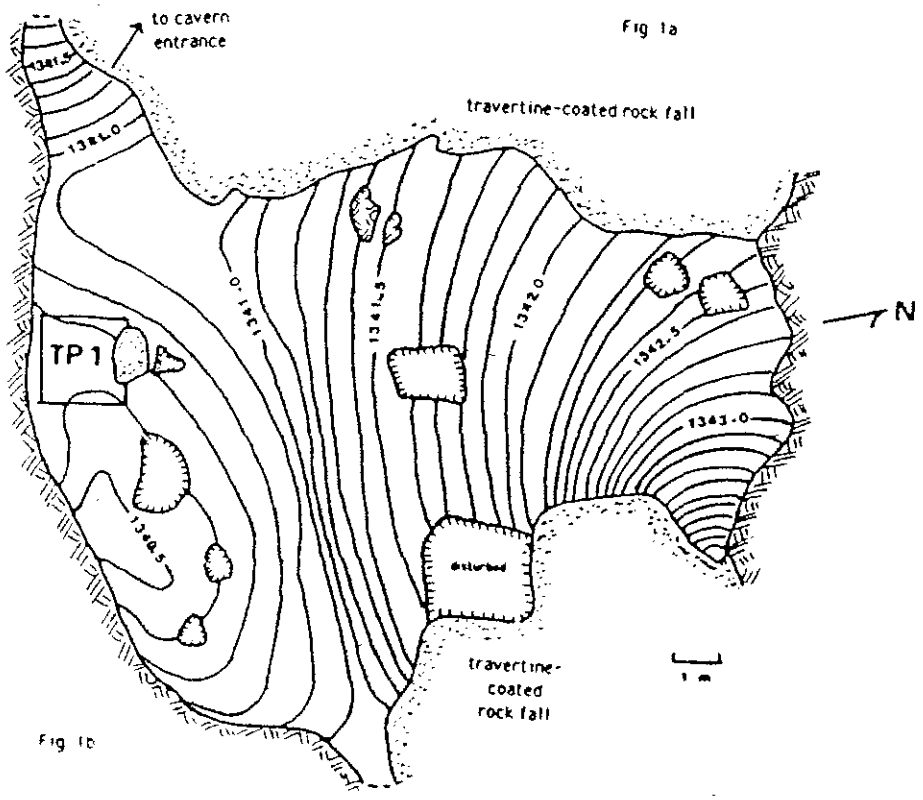


Fig 1b

1a: Map of the entrance shelter, Handprint Cave.
1b: Map of the main chamber in the interior of the cavern. Note variation in scale. Contour interval 10 cm.

be discerned, a feature that gives the site its name.

Method of Excavation

The main chamber of the cavern is in semi-darkness, and was judged unsuitable for human habitation. As well, examination of the excavated areas in the silt fill within the interior of the cavern indicated no cultural features in the stratigraphy exposed to a depth of over a meter. No cultural material -- stone flakes or broken bone of large mammals -- was seen on any of the backdirt piles from these excavations. In 1987 a 2-meter square test pit, Test Pit 1, was excavated in the area between the pictograph-bearing stalagmitic column and the south wall of the cavern, to search for any evidence of human activity near this cultural feature, and to examine the stratigraphy of the silt fill.

The excavations conducted in Handprint Cave from 3 June through 1 July 1987 were concentrated in the well-lighted entrance shelter, which should have been the main area of occupation, although no flakes or artifacts were found on the surface. Three 2-meter squares were excavated, one (Square D6) at the edge of the talus slope in the northwest sector of the shelter; and two (Squares E4 and F4) extending eastward from a large rock outcrop at the south end of the shelter into its interior, with an extension (into Square G4) to reach the rear (east) wall of the shelter.

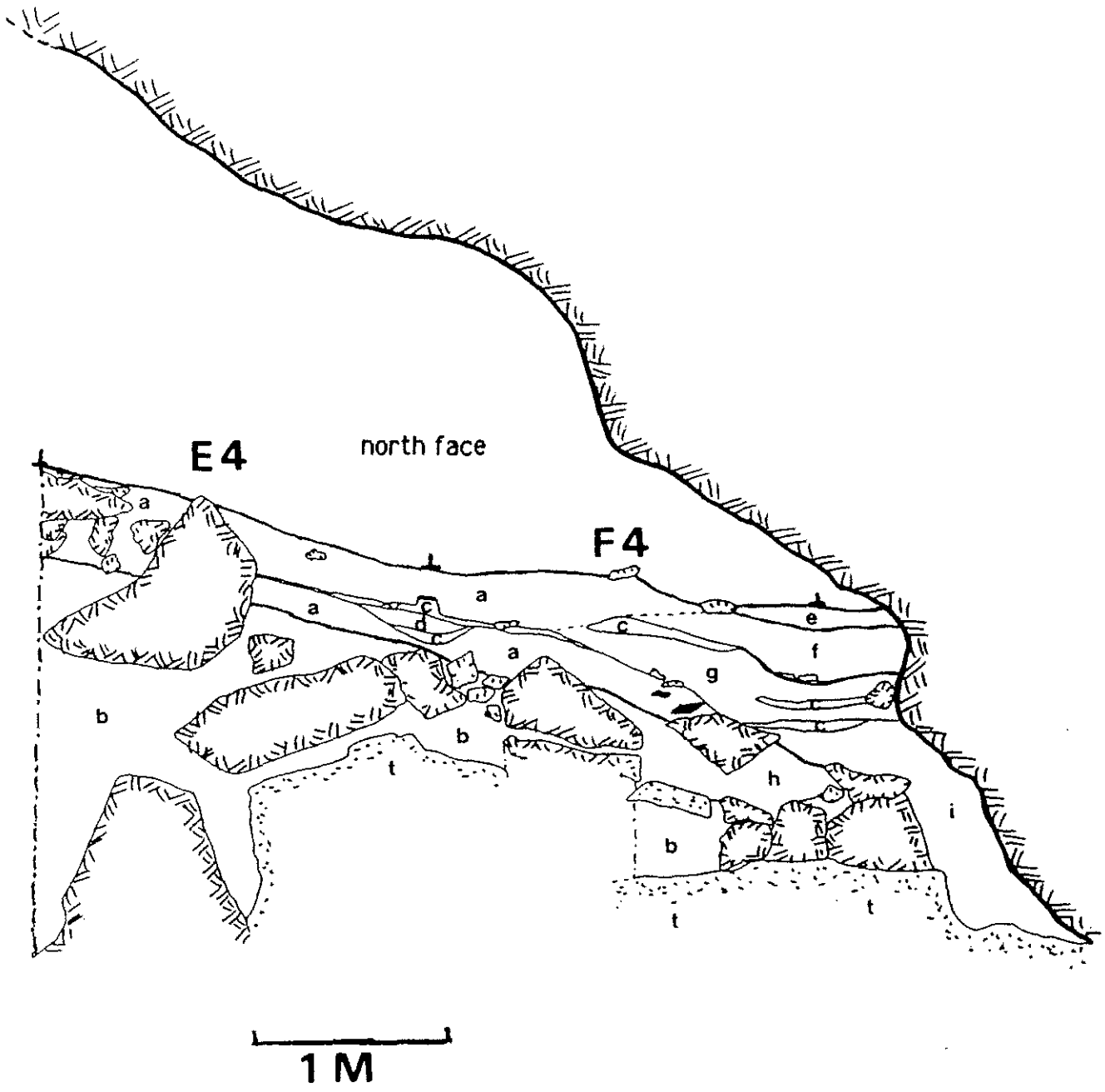
In all areas excavation normally proceeded by use of trowel and dustpan, with materials collected in buckets and screened through 1/4 inch mesh. In some instances rock picks were used to loosen materials; and on occasion a fine screen was employed to collect small bone fragments from silt deposits. All bone fragments, coprolites, hair, feathers, and vegetal materials were collected, and are now awaiting analysis.

Excavation procedures attempted to follow the natural stratigraphy as closely as possible. In cases in which stratigraphic zones appeared thick, arbitrary 10 cm units were excavated, following the surface contours of the deposit. Exposed strata were profiled and photographed. At the conclusion of excavation all units were backfilled. All materials collected from the site have been deposited in the Nevada State Museum in Carson City.

Natural Stratigraphy

At the front of the entrance shelter, in Squares D6 and E4, the major stratigraphic features encountered were zones of rock rubble in a silt matrix, pockets of disintegrating rock, and a basal zone of very heavy rockfall often coated with flowstone (Fig. 2). The bedrock floor of the entrance shelter was not reached even at the maximum depth of excavation, 360 cm below surface in Square E4, apparently being covered by a massive fall of very large angular limestone boulders. This first massive irregular rockfall was subsequently coated with a thick layer of flowstone. Later heavy rockfalls broke up this irregular flowstone cover, and crevices among the boulders and broken flowstone filled with disintegrated rock, limestone and travertine fragments, in a matrix of orange/brown silt. Small open voids remained among the rocks in many cases. Later, a zone

FIGURE 2



Profile of the north face of the main trench in the entrance shelter, Handprint Cave: **a**, rock rubble in brown silt; **b**, rock rubble in orange/brown silt; **c**, dark grey silt; **d**, grey/brown silt; **e**, dry buff silt with rubble; **f**, grey silt and sheep dung pellets; **g**, dark orange/brown silt and rubble; **h**, soft orange/brown silt and rubble; **l**, soft light orange/brown silt and rubble; **t**, travertine-coated rock.

of rubble in a brown silt matrix, incorporating occasional large boulders, accumulated over the zone of heavy rockfall.

Farther toward the rear of the entrance shelter, in Square F4, there was also evidence of an initial massive rock fall coated with flowstone, subsequently broken up by heavy rock fall, with loose limestone or travertine rubble in a matrix of orange/brown silt in the crevices among the large rocks. Near the rear of the shelter, in the east part of Square F4 and in adjacent Square G4, under a very low ceiling, there were overlying deposits of lighter orange/brown silt or grey silt which contained much less rubble (Fig. 3a). Mountain sheep apparently sheltered frequently under the rear wall of the shelter. Sheep dung pellets were abundant in the upper 30 cm of the deposits in this area, and were found occasionally preserved underneath rocks to a depth of 120 cm below surface.

In Test Pit 1, in the interior of the cavern between the stalagmitic column and the south wall of the cavern, the natural stratigraphy was quite different from that in the entrance shelter (Fig. 3b). The upper 50-70 cm of deposit consisted of a fine soft buff silt with very little rubble content. Below this soft fine silt was a deep zone of evidently waterlaid silts and clays. The upper 20-30 cm of this zone displayed fine laminations, but the lower 40-50 cm was a very compact grey sandy silt with only a few laminations of reddish clay. A massive rippled dome-like flowstone formation underlay the waterlaid silt, and sloped sharply east and south to the cavern wall. Close to the south cavern wall was a 10-15 cm thick layer of limestone and travertine rubble in a yellow/brown silt matrix, underlying the waterlaid silt and directly overlying the basal flowstone formation. This thin zone of rubble may possibly be related to the second massive rockfall near the entrance to the cavern, and the deep waterlaid silts and clays overlying might represent intervals of ponding in this part of the interior of the cave. The soft buff silt in the upper levels evidently is largely derived from the waterlaid silt zone, with erosion and extensive animal burrowing indicated by the irregular upper surface of the zone of waterlaid silt.

Cultural Features

In the entrance shelter, the major areas of human occupation appeared to be situated towards the rear of the shelter, in the more level areas in the southeast zone. In the central part of this area, several small thin lenses of dark-colored silt incorporating occasional small charcoal fragments were exposed in the matrix of rock rubble and brown silt at intervals in the upper 40 cm (Fig. 2); and towards the rear of the shelter there is evidence of ash mixed with dark grey silt or orange/brown silt to a depth of about 85 cm (Fig. 3a). However, definite discrete occupation levels were impossible to identify in the unsorted rubble, and only small concentrations of artifacts were noted. One such concentration of artifacts, all found at a depth of 50-60 cm below surface in the east part of Square F4 and in adjacent Square G4, consisted of two corner-notched points with split stems, a fragmentary corner-notched point, a concave-based point, a drill point, two possible limestone hammerstones,

FIGURE 3

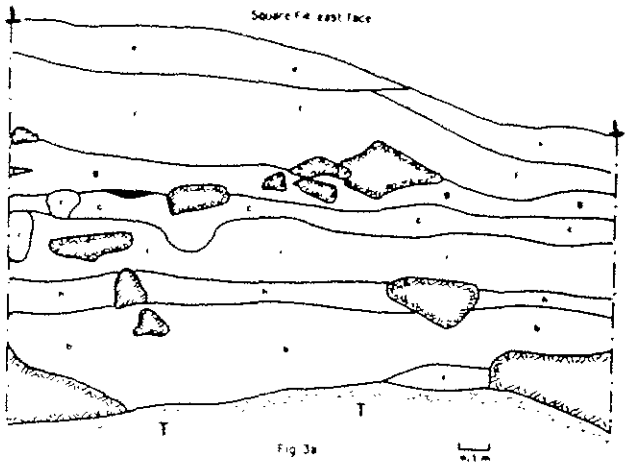


Fig 3a

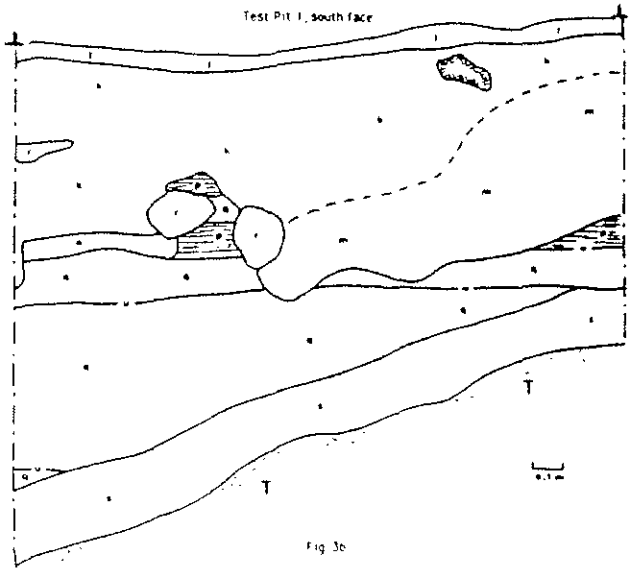


Fig 3b

3a: Profile of east face of Square F4, entrance shelter. **b**, rock rubble in orange/brown silt; **c**, dark grey silt; **e**, dry buff silt with rubble; **f**, grey silt and sheep dung pellets; **g**, dark orange/brown silt and rubble; **h**, soft orange/brown silt and rubble; **i**, soft light orange/brown silt and rubble; **r**, rodent hole; **x**, disintegrated rock; **T**, travertine-coated rock.
3b: Profile of south face of Test Pit 1, main chamber of interior cavern. **j**, soft brown silt with some rubble and rodent dung; **k**, soft buff silt; **m**, soft brown silt; **n**, dark brown silt; **p**, finely laminated grey and reddish silt; **q**, compact coarse grey silt; **u**, lines of red clay; **s**, loose fine rubble in yellow/brown silt; **T**, flowstone formation.

a possible travertine chopper, and a spall from a waterworn pebble hammerstone. Most finds in the entrance shelter, however, occurred isolated in the rubble, to a maximum depth of 115 cm below surface.

Judging by the small amount of artifactual material, occupation of the entrance shelter was never intensive. It is notable that of the 23 artifacts recovered from this area, over half are projectile points; and there was very little flaking debitage, with only half a dozen unmodified flakes recovered from the site. Bone scrap which could be attributed to human activity is rare -- most of the bone fragments recovered are of small mammals and birds, likely the by-products of raptor activity. We found very few fragments of bone from large or medium-sized mammals.

As mentioned, there was no indication that the earlier excavations made by collectors or prospectors had found traces of prehistoric human habitation within the semi-dark interior of the cavern; and only the pictographs indicated perhaps an artistic or religious use of this area. The soft buff silt in the upper 30 cm of the test pit placed near the pictographs, however, did yield evidence of human activity in the form of much charred wood, hair from a bovid (presumably bison) and a human (Mongoloid) (identified by L. Ozetsky of the Hair and Fibres Division, Forensic Laboratory, Royal Canadian Mounted Police, Edmonton), and two exceptionally fine artifacts: a beautiful stemmed projectile point of white agate, and a large retouched blade-like flake of translucent yellow chalcedony.

Artifacts

Projectile Points

Fourteen projectile points or fragments of projectile points were recovered from Handprint Cave, all but one from the rubble zones in the entrance shelter. Only three points are complete, but only one tip end (found in the backdirt) defies classification. Although none are identical, the projectile points can be grouped in four categories, relating to the technique of hafting: corner-notched with indented or split stem; corner-notched; concave based; or stemmed.

One obsidian point, found in a soft yellow/brown silt lens at a depth of 30 cm in the northwest quarter of Square F4, is most similar to the Elko Eared type (cf. Pendleton 1985: fig 59d). Measuring 34 x 24 x 4 mm, it has a triangular body with serrated edges, marked barbs, and an expanding stem with a deep basal notch (Fig. 4, a).

Three obsidian points resemble the Gatecliff Split Stem type (Thomas 1981: fig. 9; Thomas and Bierwirth 1983: fig. 82). These three points, which range in size from 41 x 21 x 4 mm to 34 x 24 x 4 mm, feature a triangular body with straight serrated notches. The stem may be parallel-sided or expanding towards the base, which has a marked indentation or notch. Two of these points came from a depth of about 55 cm below surface in a dark orange/brown silt and rubble zone in the east part of Square F4 and adjacent Square G4 at the rear of the entrance shelter; one was found in the backdirt.

Two obsidian corner-notched points are too badly broken to ascertain clearly the form of the

FIGURE 4

Artifacts from Handprint Cave. **a-j**, projectile points from the rubble zones in the entrance shelter; **k-l**, artifacts from the buff zone in Test Pit 1 in the main chamber of the interior of the cavern.

base; but one with a triangular body, serrated edges, and sharp barbs may have had a split stem. It was also found at the 55 cm level in a dark orange/brown silt and rubble zone in Square G4. The other corner-notched point, a smaller specimen which retains only one small sharp barb, came from a depth of 10-20 cm in a brown silt and rubble zone on the west side of Square E4.

Two concave-based projectile points may be assigned to the Humboldt Basal-notched type (Thomas 1981: fig. 5, a-k). One, made of a buff-colored chert or rhyolite (?), features a narrow triangular body with straight denticulated edges (Fig. 4, e). It has a deep basal indentation, and the barbs are slightly asymmetrical. This specimen, which measures 35 x 15 x 4 mm, was recovered from a depth of 35 cm below surface in a brown silt and rubble zone in the northwest quarter of Square E4. The other point, made of obsidian, was found a depth of 95 cm below surface in an orange/brown silt and rubble zone in the northeast quarter of Square F4. Measuring 40 x 18 x 5 mm, it features a triangular body with slightly convex serrated edges (Fig. 4, f). It has a deep broad basal indentation, and large slightly flaring squared barbs.

Another obsidian ovate-shaped concave based point, recovered from a depth of 55 cm below surface in a dark orange/brown silt and rubble zone in the northwest quarter of Square F4, may also pertain to the Humboldt series. Measuring 46 x 18 x 6 mm, the ovate body is widest near the center line; but abruptly tapers to a very sharp tip. The concave base is shallow, without marked spurs (Fig. 4, g).

The basal half of an unusual concave-based obsidian point was the deepest artifact recovered in the entrance shelter, found at a depth of 115 cm below surface in a soft orange/brown silt deposit among large rocks in the northwest quarter of Square F4. Measuring 25 x 25 x 5 mm, it features a very broad ovate body tapering to a narrow base, with a shallow basal concavity and two sharp basal spurs (Fig. 4, h).

The category of stemmed projectile points includes three different specimens. One, recovered from a depth of 30 cm below surface at the base of the brown silt and rubble zone in the northwest quarter of Square E4, is a short, thick, blunt ignimbrite point (Fig. 4, i), badly impact-shattered and burinated. It appears to have been shouldered, at least on one side, with a round base. It measures only 31 x 16 x 6 mm. Another specimen is the broken basal end of a square-based ignimbrite point, measuring 28 x 19 x 6 mm. One corner of the base is squared; the other is asymmetrical (Fig. 4, j). This basal fragment was also found at the base of the brown silt and rubble zone, at a depth of 40 cm below surface in the northeast corner of Square F4. These two specimens might possibly be assigned to the Parman Stemmed type (Layton 1970: fig. 33).

The third stemmed point is a beautifully flaked complete point of white agate which was found in Test Pit 1 in the interior of the cavern at a depth of 0-10 cm in soft dry buff silt. It is lanceolate and symmetrical, with excurvate edges, slight bilateral shoulders, and a slightly concave base (Fig. 4, k). There is no basal grinding. The point was shaped by very fine lateral pressure flaking, producing

a thin biconvex cross-section. The point is small, measuring 54 x 20 x 6 mm, virtually a miniature. It would also seem to fall within the Parman Stemmed type.

To summarize, a variety of projectile points was recovered from the rubble zones in the entrance shelter. Three specimens resemble Gatecliff Split Stem points. Two of these points were found at the 55 cm level in dark orange/brown silt with rubble near the rear of the entrance shelter. Another broken corner-notched point which may have had a split stem came from the same horizon. An Elko Eared point was recovered from a depth of 30 cm in the brown silt and rubble zone, and a small broken corner-notched point was recovered from a depth of 10-20 cm in the same zone. Three lanceolate points with concave bases appear to pertain to the Humboldt series. These points were distributed from 35 cm to 95 cm depth in the rubble zones of the entrance shelter. One other broad concave-based point fragment was found at 115 cm depth in orange/ brown silt and rubble. There was also a small thick single-shouldered point found at a depth of 30 cm, and a base of a square-based point recovered from a depth of 40 cm, both at the base of the brown silt and rubble zone towards the front of the entrance shelter. These stemmed points may be related to the Parman Stemmed type. The fine agate stemmed point from a depth of 0-10 cm in soft buff silt in Test Pit 1 in the interior of the cavern is also Parman-like.

Drill Point

A drill point made of buff chert, with base missing, was found in dark orange/brown silt and rubble at a depth of 52 cm below surface in the northwest part of Square G4. The tip end has been carefully retouched bidirectionally to form a squared chisel bit, but neither the bit nor the sharp serrated lateral edges exhibit any use wear. The artifact is 44 mm long, with a thick biconvex section, varying in diameter from 8 mm at the base to 6 mm near the tip.

Thin Biface Midsection

A midsection of a thin biface of red-speckled bluish-grey agate was found at a depth of 25 cm below surface in a lens of dark grey silt in the central part of Square F4. Measuring 49 x 33 x 6 mm, the artifact has a flattened biconvex cross-section. It is asymmetrical in outline, as if the original piece had one shoulder.

Retouched Flake-Blade

A translucent lemon-yellow chalcedony flake-blade with bilateral retouch was found in soft dry buff silt at a depth of 14 cm below surface in Test Pit 1 in the interior of the cavern. The flake-blade, which measures 69 x 31 x 6 mm, was evidently removed from a polyhedral core, as there is a central ridge, and the flake-blade abruptly curves inward at the distal end (Fig. 4, 1). The striking platform is ground. Both lateral edges, which converge toward the proximal end, are steeply retouched, unidirectionally on one edge and bidirectionally on the other.

Retouched or Utilized Flakes

Four of the ten obsidian or ignimbrite flakes recovered from Handprint Cave displayed evidence of

retouch or utilization on one or more edges. These four flakes range in size from 44 x 36 x 5 mm to 33 x 22 x 4 mm. Three were recovered from depths ranging from 10 cm to 70 cm below surface in the rubble zones in the entrance shelter; and one was found in the surface debris in Test Pit 1 in the interior of the cavern.

Possible Limestone/Travertine Tools

Two possible limestone hammerstones or choppers were recovered at a depth of 50-55 cm in an orange/brown silt and rubble zone in the east-central part of Square F4, near the rear of the entrance shelter. These are irregular angular chunks of limestone, measuring 101 x 62 x 73 mm and 118 x 68 x 64 mm, which have evidence of heavy battering or step-flaking on sections of edges. A possible chopper of travertine, found in the same area, is irregular in form, measuring 87 x 74 x 26 mm. Portions of two right-angled edges have been battered. Another possible travertine chopper was found at a depth of 20 cm below surface in a lens of dark grey silt in the northwest quarter of Square F4. This specimen is a rectangular chunk of flowstone measuring 80 x 63 x 64 mm; the cortex has been removed from all areas except the central portion of one face, and one end is heavily battered. Test Pit 1 in the interior of the cavern yielded another possible travertine chopper from a depth of 25 cm below surface, in dry buff silt. This rectangular chunk of flowstone, measuring 81 x 56 x 26 mm, has a plano-convex cross-section and a slightly excurvate edge which has been slightly battered.

Waterworn Pebble Fragment

A spall of waterworn pebble or exotic unidentified material may have been spalled from a hammerstone, as there is a small pecked depression on one smooth face adjacent to the fractured surface. The fragment, which measures 43 x 30 x 11 mm, was found at a depth of 55 cm below surface in orange/brown silt and rubble in the northeast quarter of Square F4.

Modified Wood

Two modified wooden shafts were found on the surface in the interior of the cavern. One is a straight cylindrical wooden shaft (262 mm long and 6 mm in diameter), with one end broken off and the other symmetrically dowelled a distance of 14 mm. The other wooden shaft, 878 mm long with a diameter of 9-11 mm, is a curved cylindrical stick with both ends broken off rather squarely, and the surface apparently scraped. Despite its curve, the piece would seem too weak to have been used as a bow.

Discussion

Any Pleistocene deposits which might exist in Handprint Cave could not be definitely identified in the 1987 excavations, and no evidence of a late Pleistocene human occupation of this high cave was found. The presence of abundant flowstone in the entrance shelter suggests that the original entrance to the cavern, which would not be likely to have active flowstone, may have collapsed and been transported down the talus by early Holocene times. After the collapse, there may have been too much heavy rockfall for a comfortable occupation area at the

entrance. To judge from the Gatecliff Split Stem and Humboldt series projectile point styles represented in the artifact assemblage recovered from the rubble zones, the major period of occupation of the entrance shelter was late middle Holocene, about 5000-3000 years B.P. (Thomas 1981); although two Parman Stemmed points suggest earlier occupations (cf. Layton 1987: Fig. 4; Layton 1972). The stratigraphy in the entrance shelter is complex, and the projectile point sequence is not clearly defined.

A radiocarbon date of 4480 ± 105 B.P. (Beta-22961/ETH-3398) was obtained on charcoal from a depth of approximately 60 cm below surface in the northeast quarter of Square F4 near the rear of the entrance shelter in Handprint Cave. This date relates to the small artifact assemblage which features Gatecliff Split Stem and Humboldt series projectile points.

The nature of the cultural materials recovered suggests that the entrance shelter functioned as an occasional lookout for hunters, who may have rearmed their projectile shafts on the spot but did very little flaking in the shelter. The very low frequency of other kinds of artifacts, as well as the lack of bone refuse, probably indicates that the site was never intensively occupied or utilized by family groups. After the late middle Holocene period it may have been too high for easy access from important activity areas on the valley floor.

The pictographs of a rare type--red handprints -- on a stalagmitic column in the semi-dark interior of the cavern are intriguing. A radiocarbon assay of the charcoal from the 10-20 cm level of the adjacent test pit resulted in a date of 10,740 ± 70 years B.P. (Beta-21885). It is possible to speculate that this date indicates the age of this cultural feature, as well as the age of the two fine artifacts which may have been offerings at this special place.

Acknowledgements

The field work at Handprint Cave was conducted under BLM CR Use Permit no. N-46542, with support from the Fleischman Foundation and the Nevada State Museum. We are most grateful to the personnel of the BLM Winnemucca District Office for the invaluable assistance that they provided the project; and to the other volunteers who helped us in the excavations. The cost of the radiocarbon dates was covered by a grant from the Support for the Advancement of Scholarship fund of the University of Alberta.

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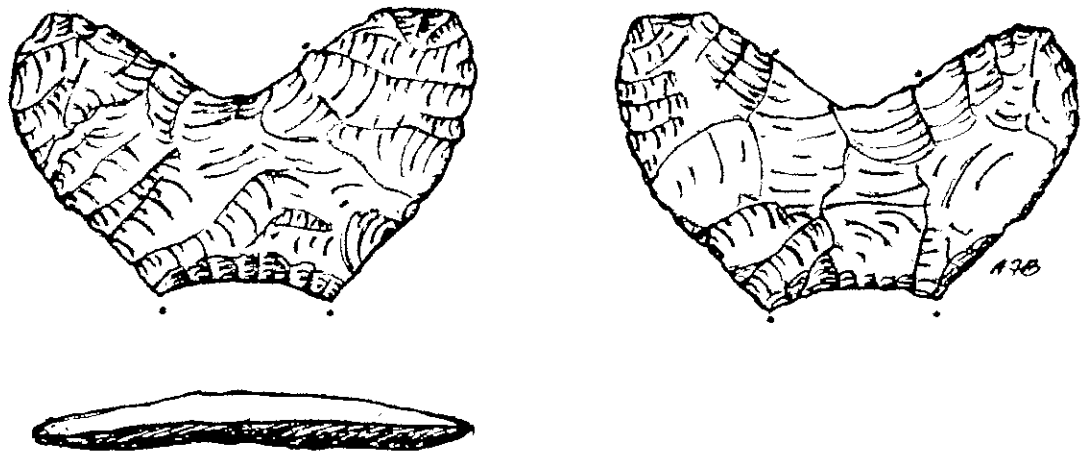

A Type III crescent found near Denio Junction, Nevada (Actual Size). The base and saddle areas (between the dots) have been ground.

A CRESCENT FROM AN UPLAND SITE IN HUMBOLDT COUNTY, NEVADA

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During a 1986 fire-reclamation survey in the BLM Winnemucca District, a flaked-stone crescent was found in an upland site, an unusual location for this type of artifact. The crescent, a Type III butterfly (Tadlock 1966) is complete and well-made. It is of a pale cream/orange chert that grades into an apricot color on each wing-tip. The colors are balanced, and the esthetic qualities of the piece are immediately apparent. The base and saddle have been ground and the edges are smooth.

The site at which it was found lies along an upland creek southeast of Denio Junction. Other diagnostic artifacts from the site include a Cascade type point and a trade bead, indicating that the site was used from before 8000 B.P. up until the Eureopean Contact period.

Unlike the Denio Junction butterfly, the majority of crescents found in the Great Basin have been picked up on or near former pluvial lakebeds. One principal source is site HU17 (Clewlow 1968), on the Black Rock Desert playa about 60 miles south of the Denio Junction locale.

There are several means by which the crescent could have been deposited at its non-lacustrine upland location. First, people of the Western Pluvial Lake Tradition need not have been completely dependent upon wetlands resources (Rozaire 1963). The crescent, a fine piece not to be casually discarded, could have been lost at the upland campsite during a big-game hunting excursion. Second, it may have been removed from the Black Rock, or similar setting, in more recent pre-history by someone who found it, kept it as an ornament, and later lost it at the upland site. In either case, seasonal rounds from pluvial lake basins to upland areas are suggested.

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THE LIFE HISTORY OF A HORSESHOE NAIL

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Introduction

This paper discusses the differences between hand-made and machine-made horseshoe nails, and describes the specialized ways in which horseshoe nails are used and disposed of by the farrier. These specialized uses reflect a regular use-cycle that leads to a predictable discard pattern.

Because of the predictable discard pattern there are five categories in which every recovered horseshoe nail or nail fragment can be placed. With the use of these five categories to describe life histories of recovered horseshoe nails, more accurate and meaningful descriptions are possible for human activities at historic sites where horses were present.

In this paper, I refer to data from two sites in western Nevada to demonstrate the effectiveness of the classification method in historic archeology.

The Life History of Horseshoe Nails: From Manufacture, to Use, to Discard

The "Life History" of a horseshoe nail begins with its invention and its method of manufacture. The horseshoe nail was a secondary invention coming about as a result of its association with the nail-on-type horseshoe. Horseshoe nails were originally a hand-made specialty nail requiring higher quality metal than ordinary carpentry nails, along with a different tempering process, and several additional steps in manufacture. Farriers did not begin to use machine-manufactured horseshoe nails until the middle to late 1860s.

Making Nails by Hand

Hand-made horseshoe nails (as opposed to machine-made) can be identified by noting slight differences and irregularities in shape, dimensions of the head, the angle of the shoulders, and the thickness of the body, as found in nails in single collections. In addition, the top surface of the nail head will show evidence of having been cut off on the cutting edge of a hardy, using a heavy hammer. A "hardy" is an attachment for an anvil which goes in a square hole in the anvil's striking surface. On one end of the hardy is a square shank designed to fit into the anvil's square hole, and on the other end is a tempered cutting edge standing parallel with the surface of the anvil. When a hammer hits the hot nail rod that has been laid on a hardy, the nail's head is left with a sort of pinched look or narrow ridge down the middle.

A skilled blacksmith would not cut the nail completely off with the hammer because he does not want the hammer to contact the hardy's edge, which would result in breakage of the tempered metal of either the hammer or the hardy.

When archeological analysis is done on horseshoe nails quite often the nails are classified in the cut

nail category, indicating machine manufacture. Hand-made horseshoe nails may at first appear to be produced by the machine process used for cut nails, but unlike carpentry nails the shape of horseshoe nails is not the result of the manufacturing method but rather a requirement placed upon the nails by their usage. The common cut nail with its square shape and untapered body could not be driven through the tissue of a horse's foot without causing damage and injury. In general, the basic special requirements for a horseshoe nail are: it cannot splinter while being driven; it must be able to penetrate the hardest hoof without bending, yet be capable of being bent and clinched without breaking; the nail head must stay secured to the shank of the nail; and when driven the nail must go where it has been directed (Anonymous 1873:14).

In 1869 H. Sample emphasized the need for using the very best nail rods to make horseshoe nails, and he stated that after forming the nails from the hot iron they should not be cooled quickly, but left spread about to cool by degrees, because to cool them quickly or to pile them up to cool would make them brittle (Sample 1869:28-29).

John Gustaf Holmstrom (1902:36) stated that when making horseshoe nails it is necessary to start with quality iron because if poor iron is used the nail is liable to split and lame the horse, causing death by lockjaw. He suggested using a nail rod of soft steel or Swedish iron measuring 1/2 inch by 3/16 inch.

Although the first horseshoe nail-making machine was patented in 1851 by M. Burnett of Boston (patent # 8,006 U.S. Government 1874:751), no one was very successful in producing acceptable machine-made horseshoe nails before the mid 1860s. Accordingly, well into the 1870s many farriers made their own nails or used hand-made nails made by others. As late as 1869, one horseshoeing author strongly advised that making your own horseshoe nails was the only sensible thing to do because of the poor quality of machine-made horseshoe nails (Sample 1869:28).

A blacksmith made nails during his off time ("slow time"); or, in a larger shop, nails were made by an apprentice. Sometimes an old farrier that could no longer bend over to shoe horses would act as a specialized nail maker. One of my informants, a long time horseshoer, told about "gypsies" that in the old days travelled from shop to shop making nails (LeBour 1986).

Making Horseshoe Nails by Machine

Between 1851 and 1870 there were 46 patents for machines to manufacture horseshoe nails (U.S. Government 1874:751-752). The first manufacturers appear to have been more concerned with producing a nail that looked like a hand-made nail, rather than with producing a nail what would be able to function as a hand-made horseshoe nail (Anonymous 1873:12).

The early manufacturers are also accused of using poor quality metal because they had no practical knowledge of what a horseshoe nail should be, and merely copied the shape of the hand-made nail (Anonymous 1880:1).

To meet the basic requirements of the horseshoe nail, companies were forced to use Swedish or Norwegian iron. Also, the manufacturing

processes became very complex requiring six separate machines: rolling mill, flattening machine, cutting machine, rumbling machine, heading machine, and the shaping machine (Anonymous 1873:12).

The early machine-manufactured nails were cut cold, a process blamed for the splitting or delamination problem which eventually led to a method of "Hot Forged" nails. in 1879 Putnam Nail Company of Neponset, Massachusetts, offered a "Hot Forged" nail that was not sheared or cut, and the company guaranteed their nails "...never to split or sliver in the driving and to hold the shoe longer than any other nail" (Putnam Nail Company 1879:21).

In 1886 George Fleming, who favored the use of machine-made nails, listed several advantages for their use; machine-manufactured nails "are ready for immediate use, the nails are perfectly smooth on their surfaces, and they are strong at the point and always uniform in size and thickness" (Fleming 1886:204).

It would seem that by the late 1880s most of the technical problems had been solved. In 1898 William Hunting reported that machine-made nails were nearly as good as the very best hand-made nails. However, Hunting closed with the caution that manufacturers must continue to use only "the very best iron to produce good nails" (Hunting 1898:63).

With the successful manufacturing and marketing of the machine-made horseshoe nails in the 1870s we see the development of different sizes of nails along with different shapes and sizes of nail heads. In terms of nailheads there are three basic types: City Head, Standard, and Regular. In their early years machine-made nails were offered with different finishes; one of these finishes was called "blued" and the other was "bright" or "polished". Nails were manufactured by companies such as The Fowler Nail Co. (which started operation in 1866), The National Horse Nail Co., Northwestern Horse Nail Co., and the Capewell Horse Nail Co., which was founded in 1881 and is the only American manufacturer still in the business today.

A survey of product advertisements in the trade journals Iron Age, The Blacksmith and Wheelwright, Horseshoer's and Blacksmiths Journal, and The International Horseshoer's Monthly Magazine of the last century and first two decades of this century indicates that horseshoe nail-making was a specialty. The manufacturing of horseshoe nails appears to have been so specialized that few, if any, companies manufactured both shoes and nails. This seems to have applied as well to companies that manufactured cut nails, bolts, spikes, etc.

Using a Horseshoe Nail

Regardless of how a horseshoe nail is constructed, either by hand or machine, once it reaches the farrier its life history is the same. Once the horse's foot has been prepared and the shoe is properly fitted the nails are retrieved from either the farrier's shirt pocket, leather apron pocket, pants cuff, shoeing box, or mouth, The nail is then hammered into the horseshoes' nail holes and through the outer edge of the horse's hoof. Once driven through the wall of the horse's foot, the nail should not be driven higher than one inch to one

and a half inches high on the wall of the foot because of the possibility of injury to the foot (Anonymous 1912:61). The protruding nail is then quickly bent over by a pull from the edge of the hammer head or claw area of the hammer. The nailing process for a saddle horse usually involves 8 nails (four on each branch of the shoe), while larger draft horses can require 5 to 6 nails for each branch. Once the nails have been bent over and the shoe secured, the nail ends are clipped off either by the use of clippers or the claw side of the hammer head. This claw is an American adaptation to the horseshoeing hammer and its making is demonstrated in The Practical Horseshoer (Richardson 1893:42-43). Regardless of the method of clipping, the clipped nail-end falls to the ground.

The nail is then "clinched" by the use of a clinching tool (a device like a large pair of pliers that reaches from the nail head to the now bent over and clipped tip of the nail). The clinching tools is squeezed, thereby pulling the nail tip into a very tight bend laying it flush with the surface of the wall of the foot. The first patent for a "tool for clinching horseshoe-nails" was granted on 6 August 1861, to J.E. Draper of Northville, Michigan (patent # 32,989). Patents for similar devices followed in 1864, four in 1869, 1871, and 1872 (U.S. Government 1874:751). The more traditional way of "clinching" the nail is to hit the nail head with the hammer while holding a metal block or the closed head of the clippers at the bend in the tip of the nail. This action produces a sharp bend in the nail. The bent end is then tapped off with the hammer to make it flush with the wall of the foot.

After a horseshoe is attached, the nail remains in place until either the shoe falls off the rotting broken foot, the horse pulls the shoe off by stepping on it, or until the farrier removes the shoe, which could be in about 4 to 6 weeks depending on the amount and type of work being done by the horse (Butler 1974; Richardson 1893).

When a farrier comes to take off the shoe he first must remove the clinches from the ends of the nails. This is done by either cutting the bent part of the nail (the clinches) off, or by straightening the bent part of the nail (Anonymous 1912:48; Youatt 1831:313). Then the nails are pulled out individually or as a group as the shoe is removed from the hoof. The nails are usually removed from the old shoe and discarded. The old shoe may be reused as is (if not badly worn), rebuilt by welding strips of metal to the worn area, or reworked to make new nails or new shoes. The old nails cannot be reused because the tips have been cut off, plus the head is probably worn down and the overall nail is no longer straight. The amount of metal in an old nail is too small to be reworked or welded together with other nails to be reworked and formed into some other object. The common blacksmith of the last century did not pour new bars of iron, but rather reworked bar or scrap iron that had been smelted in an iron foundry.

The functioning life history of a horseshoe nail ends as the farrier discards his nails.

The Discarded Horseshoe Nail

If the work place of the farrier is a dirt floor or an unimproved outside area then a dropped or

discarded nail would probably be allowed to lay where it fell or was tossed. If the work area was a wooden floor or other prepared area the nails would have been collected (swept up) and disposed of. A long established blacksmith shop with a regular amount of work over many years would have built up a midden deposit that would at some point begin to interfere with equipment and movements of the farrier, thereby requiring the removal of this midden layer by shovel. This behavior is evident where piles of blacksmith waste are scattered in the surrounding area. The waste piles will usually consist of sand with small fragments of metal, lost or discarded nails, fragments of horseshoes, charcoal, coal, coke, clinkers, and cinders.

Evidence of the Horseshoe Nail Use-Cycle

Discarded horseshoe nails recovered from historical sites can be classified into five categories, each reflecting specific aspects of the "Horseshoe Nail-Use Cycle" which occurred at the sites.

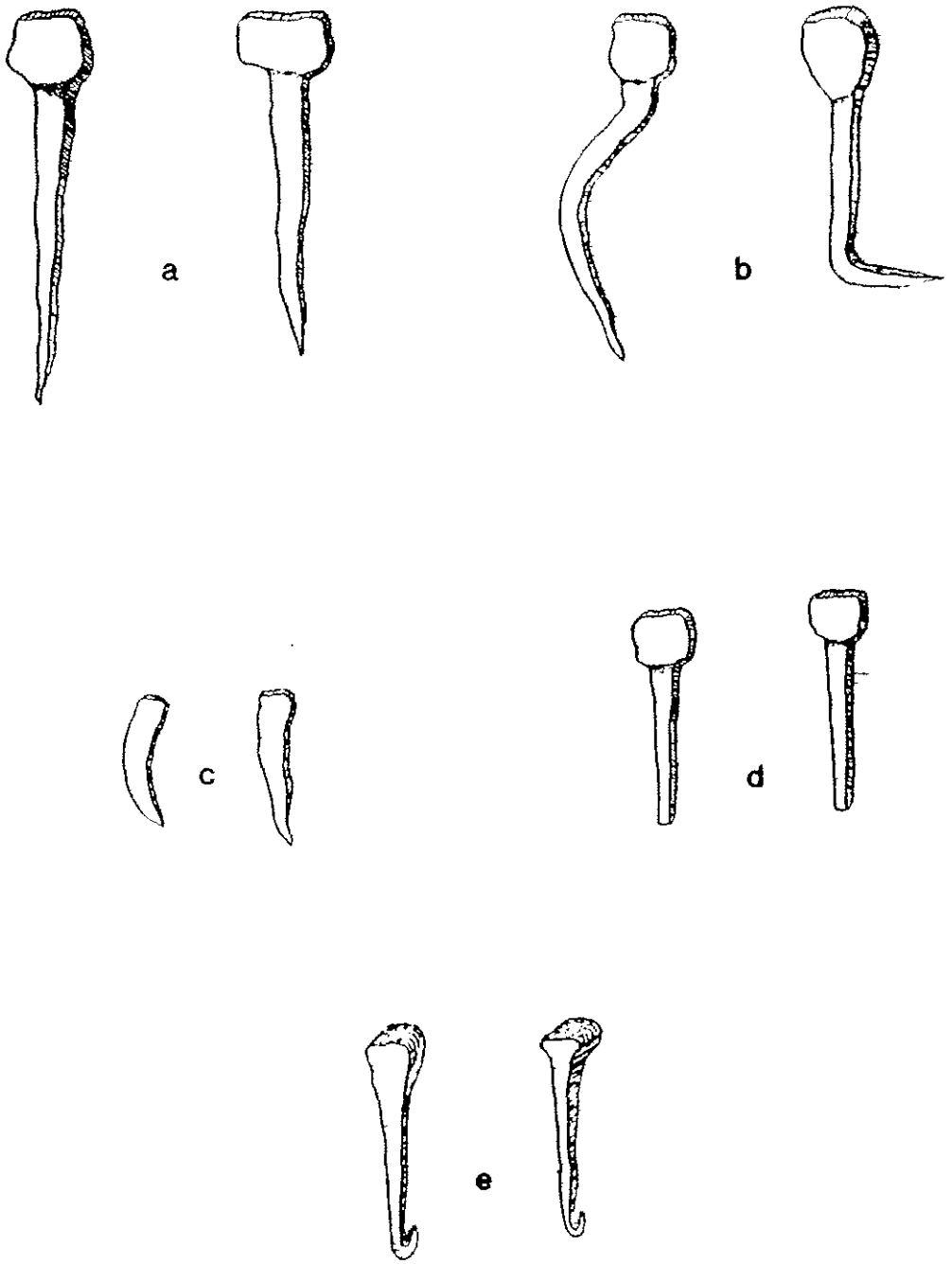
The five categories of horseshoe nails that can be recovered from archeological sites are: (1) new nails (never used) (Fig. 1 a); (2) bent nails (Fig. 1 b); (3) nail tips (Fig. 1 c); (4) used nails with clinches straightened (Fig. 1 d); and (5) used nails with clinches still in place (Fig. 1 e).

(1) The recovery of an unused or "new" nail occurs whether the nails are hand-made or machine-made, and those discoveries are most often the result of storage. Hand-made nails are made in advance of shoeing during slow times and machine-made nails were bought in by the keg in several sizes. Also a "new" nail may drop from the farriers pocket or hand while in the act of shoeing a horse. If the work area consists of a dirt floor, a nail may not be retrieved. The recovery of a number of "new" nails in one place would suggest a storage area, while "new" nails recovered among bent nails, nails tips, and used nails suggests a work area where horses were shod.

(2) The bent horseshoe nail is a condition that occurs when a nail is being driven into the horse's foot. It quite often occurs on the first hit of the hammer on the nail head. This bending could be the result of the hammer head and nail head not being properly aligned, the nail being held at an incorrect angle, or the nail trying to penetrate an especially hard spot of the horse's foot. Poor quality of a nail may also cause bending. The Capewell Nail Company suggested in a 1918 advertisement that their nails were of such high quality that in hot and dry climates they will not bend in the "driving" and be wasted like many of their competitors' nails (The Capewell Nail Company 1918:10). A horseshoe nail may also become bent if in the "driving" the nail does not go where the farrier wants it to go, such as if it is either too high or too low. When this happens, the farrier pulls the nail out, and usually bends the nail when doing so. In most cases a farrier would not attempt to straighten the bent nail because it is very difficult to get the nail straight enough to be accurately driven a second time and prevent injury to the horse.

Bent nails are discarded and never used again. The discovery of bent nails indicates that a normal part of the shoeing cycle occurred at the site.

FIGURE 1



a. New nails (never used). b. Bent nails. c. Nail tips. d. Used nails with clinches straightened. e. Used nails with clinches still in place.

(3) Nail tips are created by the farrier when he clips the tip of the nail off after it has been driven through the wall of the foot. No other process will create these nail tips. As the farrier clips the tip of the nail it usually falls straight down from the foot. The act of clipping does not result in nail tips flying in all directions because the metal that a horseshoe nail is made from and the tempering of that metal are designed to produce a nail that is soft, flexible, and yet pliable rather than hard, stiff, and brittle as in carpentry nails. These tips should also be of similar length, about 3/4 of an inch long, because the standard wisdom on placement of nails suggests that they should be about the same height on the wall of the foot. The height on the foot in which the nail can be placed is somewhat controlled by the live tissue and the structure of the foot itself. Placing the nail too low will cause the wall of the foot to crack and break up, while going too high will cause penetration of the sensitive tissue, resulting in lameness.

The nail tips are artifacts that in many historical archeological sites are not recovered or are identified as general nail fragments. But unlike the fragment classification of many artifacts, the reason that a horseshoe nail tip is a fragment has nothing to do with the level of preservation. In most cases these clipped tips fall where they were clipped and form a site deposit similar to the flaking waste from flint knapping. And like flaking waste, the recovery of nail tips indicates that a specific activity (the installing of horseshoes) took place at that location.

(4) Used nails that have the clinches straightened are usually found in an area where horseshoes were removed. Whenever a nail is actually used to hold a shoe on (the primary purpose of a horseshoe nail) the tip is cut off and a clinch made in the stub of the nail. When a shoe is removed, the clinches must first be straightened or the clinches cut off entirely (Pratt 1876:445; Youatt 1831:313). Sometimes the straightening of clinches results in the clinch breaking off. Regardless of the method, the desired effect is to have a straight nail that can be pulled out of a horse's foot without damage to the foot. If even one clinch is left holding the shoe on, the portion of the foot's wall that it is fastened to may break off when the shoe is removed (Anonymous 1912:48). Once the nails have been straightened they can be removed individually from the foot, or the whole shoe can be removed taking the nails with it. If the nails are removed individually they may be dropped and forgotten on the spot or collected and disposed of in a garbage area or toss zone. If the shoe is pulled off with the nails in it there are two possibilities for the resting place of the nails. If the shoes are to be re-used the shoe will probably be taken back to the anvil where the nails will be removed. In a very temporary location the nails may be allowed to drop and accumulate around the anvil and work area. Otherwise, the nails will be taken to a garbage area. If the shoe is not to be reused or reworked, the nails in most cases would not be removed. The worn-out horseshoe with nails in it will be disposed of in the blacksmith's "discard area". Sometimes the nails are not held firmly in an old worn-out shoe, so that some nails may fall out on their own as the shoe

makes its way from the horse's foot to the garbage dump.

(5) It is very unlikely that used nails with clinches still in place, loose and on their own, will be found in a site. With a clinch still in place the nail would be very difficult to remove from the shoe and it would be nearly impossible for the nail to just drop out. If all the nails in a recovered horseshoe have clinches in them the shoe was not taken off by a farrier but rather was pulled off by the horse. If one or two nails have clinches while the rest of the nails have straightened clinches then it would be evidence for the removal of the shoe by a farrier, but that the horse's hoof was broken in spots so that the horseshoer did not have to straighten all of the clinches, since the hoof around those particular nails was broken and no longer holding the nail. A used nail with clinches still in it will not necessarily be found in a horseshoeing area and does not need to be found for a site to contain adequate evidence that the complete shoeing cycle took place there.

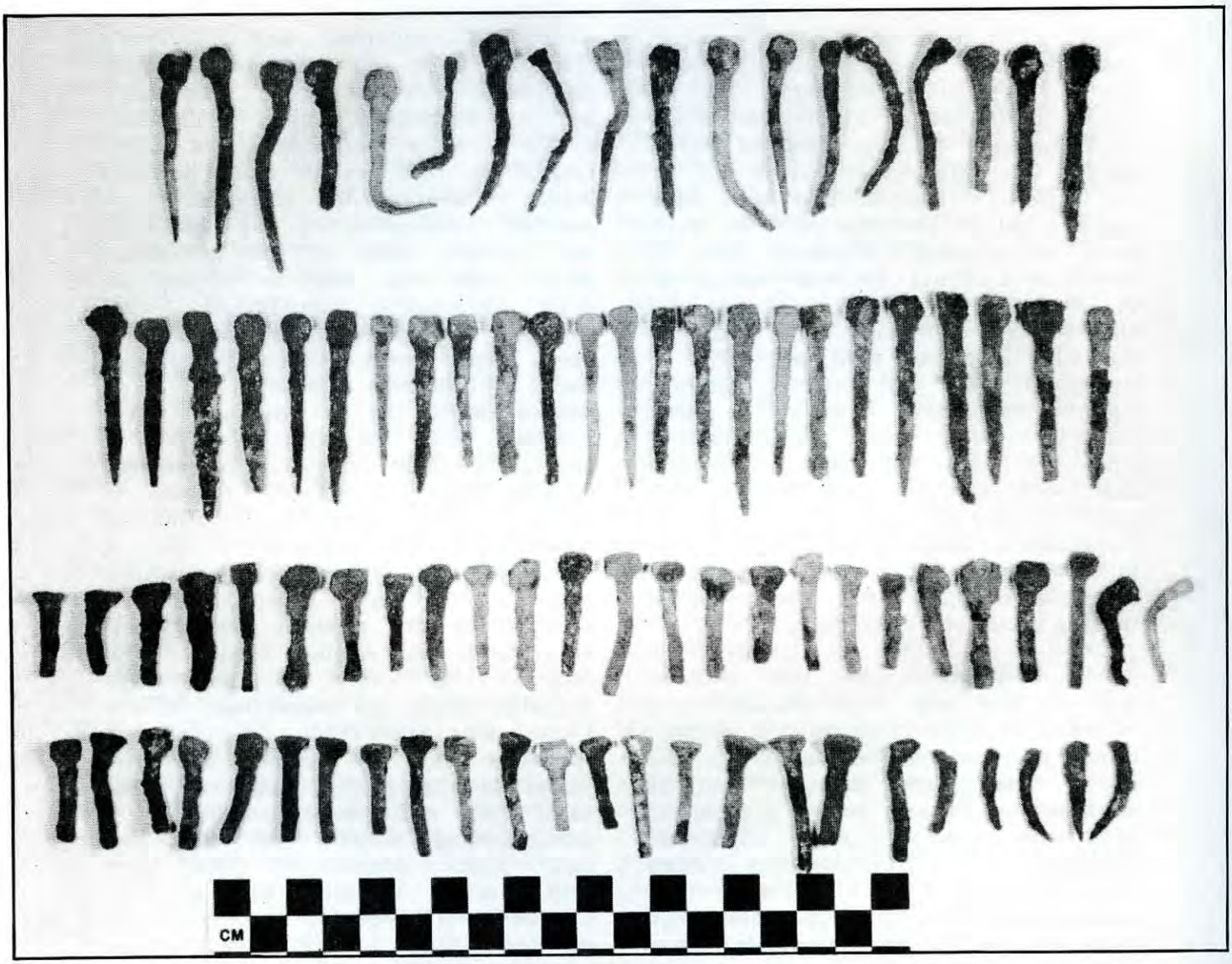
A horseshoe with the clinches still in the nail will probably not be found in the blacksmith's garbage dump, but would be found in the corral area or as an isolated artifact. These shoes are quite often in very good condition, showing very little wear. Most important about nails with the clinches still in them is that their recovery does not indicate that horseshoeing or blacksmithing took place at a given site.

The Horseshoe Nails of Fort Churchill, Nevada

The site of Fort Churchill, a 19th century U.S. Army outpost, is situated near the Carson River about 12 miles east of Virginia City, Nevada. Established in 1860 to protect the ranching and mining areas from Indian attacks, it operated for less than a decade. During archeological investigations undertaken in 1975, 91 horseshoe nails and horseshoe nail fragments (Fig. 2) were recovered in an area that has been tentatively designated as a blacksmith shop (Hardesty 1978). The artifacts are now located in the Nevada State Museum Annex, Carson City, Nevada. A careful examination of the horseshoe nail reveals them all to be hand-made nails that can be placed in each discarded horseshoe nail category except category number 5 (used nails with clinches still in place). Category number 1 (new or unused nails) is the second largest category with 24 nails. Category number 2 (bent nails) is represented by 18 nails. Category number 3 (used nails with no clinches) represents the largest recovered category with 44 nails. Category number 4 (nail tips) with 5 artifacts is the smallest sample and is probably not a good sample. The recovery of only 5 nail tips probably does not accurately reflect the horseshoeing activities suggested by the number of nails found in the other categories. For each used nail there should be a corresponding number of nail tips cut from them. The low representation of nail tips at Fort Churchill is probably a result of misidentification or non-collection of unidentifiable metal fragments.

The complete use-cycle of horseshoe nails is represented in the Fort Churchill sample and is evidence that the shoeing of horses took place at this site along with the removal of horseshoes by a

FIGURE 2



Horseshoe nail collection from Fort Churchill, Nevada.

farrier.

The Horseshoe Nails of Cold Springs Pony Express Station

Cold Springs Pony Express Station, between present-day Fallon and Austin, Nevada, was probably built in 1860 as a support station for the pony express riders. Documentary records indicate that the station was completely abandoned by 1863. Archeological investigations completed in May, 1976, recovered 29 horseshoe nails and horseshoe nail fragments (Hardesty 1979). The artifacts are now stored in the Anthropology Research Museum, Anthropology Department, University of Nevada-Reno. A thorough study of the 29 nails and nail fragments indicates that they are all hand-made and represent clearly defined steps in the use-cycle of the horseshoe nail. Category number 1 (new or unused nails) with 3 nails is the smallest group in this collection. Category number 2 (bent nails) is represented by 4 specimens. Category number 3 (used nails with no clinches) is the largest group with 17 artifacts. Category number 4 (nail tips) is represented with 5 specimens. Nails in category number 5 (used nails with clinches) were not recovered at the Cold Springs site.

Conclusion

The horseshoe nails from both the Cold Springs Pony Express Station and Fort Churchill demonstrate the complete record of the categories of discarded horseshoe nails that will be present when a farrier has worked at the site.

A horseshoe nail has a very specific function, dictating how it will appear in the archeological record. The predictability of horseshoe nail disposal has allowed me to isolate five categories in which all archeological horseshoe nails and horseshoe nail fragments can be placed. These five categories are: new nails (never used), bent nails, nail tips, used nails with clinches straightened, and used nails with clinches still in place. By placing recovered nails into these categories it is possible to gain a clearer picture of activities that took place at historic sites.

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A BIRD-SHAPED STONE ARTIFACT

Phil W. Hutchinson
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On January 24, 1980 a Cable Maintenance Technician working for the Telephone Company found an unusual bird-shaped artifact on private land near the lake bed of the Smoke Creek Desert.

In the fall of 1981, my wife and I visited the site, and found several other artifacts on the private ranch. All artifacts, and standard archeological documentary information, were given to the Nevada State Museum.

Our archeological survey covered the abandoned ranch area, [redacted] Nearby is a shallow spring full of murky water, surrounded by cottonwood trees, willows, and cattails. An historical marker near the spring is marked "Wall Spring, Nobles Cutoff, 185[illegible]". Several other depressions or dry holes are located between Wall Spring and the lake bed, a distance of approximately 500 yards. Areas near the dry holes are littered with chips.

The abandoned ranch is located approximately 400 yards southwest of Wall Spring. A fast flowing artesian well feeds water to a small pond and meadows on the east portion of the ranch. The Telephone Technician found the bird artifact between cable marker [redacted].

A Sample of the Artifacts Collected

Our documentation of artifacts is based on selected *in situ* photographs and use of small envelopes containing a serial number and a metric grid on one side and the following data on the reverse side: date collected, site, distance and bearing from fixed datum point, specimen type, material, item, and photo number. Classification of projectile points was based in part on Thomas (1981). Rosegate series points were found at the site, suggesting an age between about A.D. 700 and A.D. 1300.

The bird shaped artifact is made of obsidian, weighs 6.3 grams, is 31.1 mm across the wing tips, 42.9 mm from the top of the head to the middle of the base, 18.2 mm from the beak to the rear of the head, and 17.2 mm across the base. Edges are very sharp and the base is indented. One wing is longer than the other (34.6 mm versus 31.6 mm). The maximum thickness is 4.6 mm. The flaking and bird-like image is well executed.

Bits of white sand are still imbedded in small crevices in the neck and wing areas, similar to sand taken from the lake bed.

In my opinion whoever made the bird-shaped artifact knew what he wanted and was a skillful craftsman. Speculations about the purpose of the artifact are numerous. Perhaps this artifact was a Shaman's thunderbird (religious symbol of the Southwest), or a cormorant drying its wings in the sun.

Also found was a large obsidian knife, weighing 33.5 grams, and measuring 92.3 mm long, 35.1 mm wide, and 10.7 mm thick. It is leaf shaped and shows controlled tertiary flaking throughout. It was found in the vacinity of a lone juniper tree on the beachline, about 400 yards from the ranch meadows. This artifact has obviously lain in the beach soil for a long time as one side is patinated and the white bits of soil are imbedded in crevices. The unpatinated obsidian looks as though it was knapped yesterday and has a shiny luster, similar to the bird artifact.

Only one end of the bird and knife were exposed, when they were found, indicating that blowing sand could have repeatedly covered and uncovered these artifacts and exposed them to moisture. It may be useful to make an obsidian hydration test of the knife and the bird.

A white bead was also found at the site. It is coarse-grained and very asymmetrical (not round). It appears to be a typical trade item, and is probably ceramic. Also found were debitage, a metate, a mano, and fossilized teeth.

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Eccentric obsidian artifact from the Smoke Creek Desert. Scale bar = 1 cm.

INCISED STONES FROM THE GREAT BASIN: A COMPARISON OF SITES

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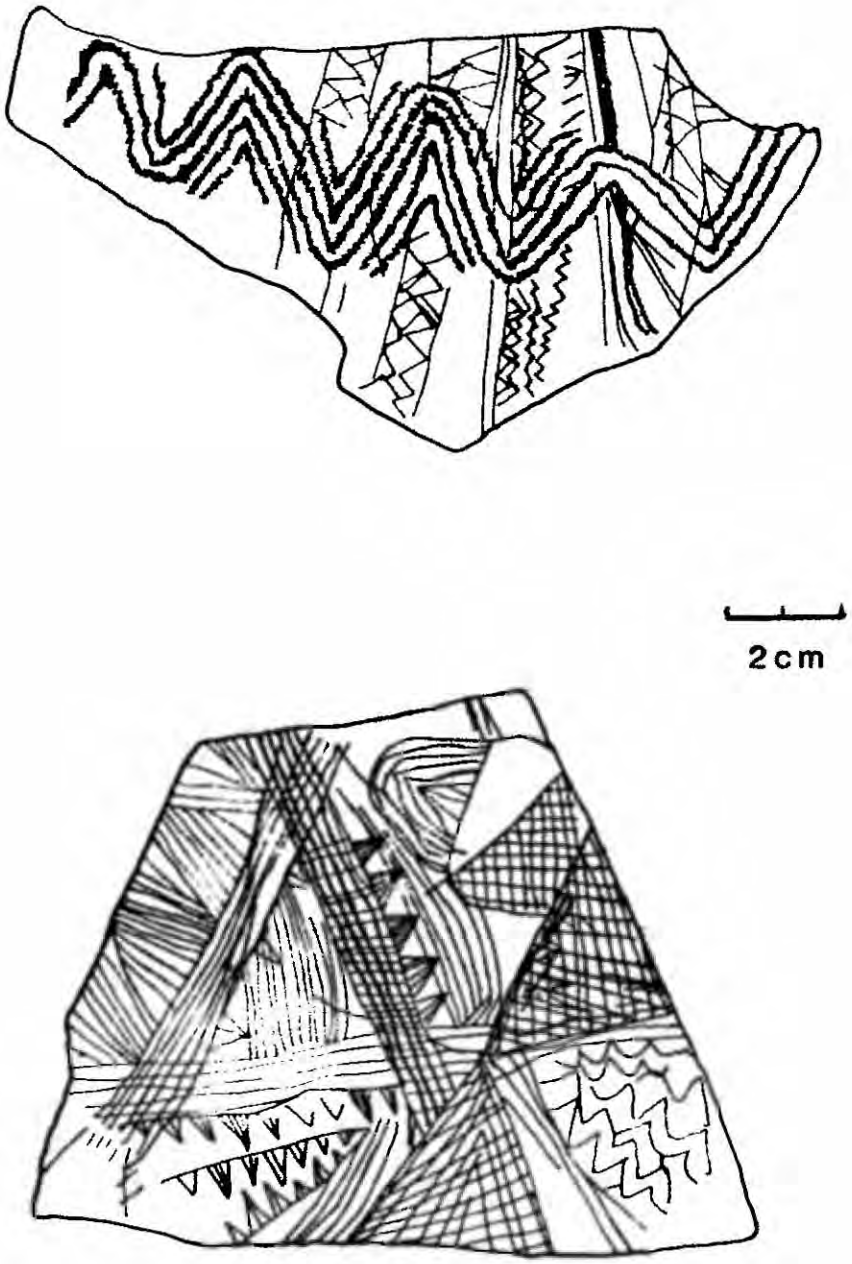
Introduction

Mentions of incised stones (see Fig. 1 for examples from the James Santini Collection) have appeared in the Great Basin archeological literature for over 100 years, since an early, brief reference was made to their unknown use (Abbott 1879). Loud and Harrington uncovered a sample in Lovelock Cave which they classified as "problematical stone objects" (Loud and Harrington 1929:108). Other names for these "problematical objects" have included "guardian spirit effigies" (Osborne 1957:65); "petroglyph slabs" (McKee and Thomas 1972:86); "decorated stone" (Sharrock and Marwitt 1967:34); "incised tablet" (Bennyhoff 1957:26; Budy 1987:79; King 1981:48); "incised stone tablet" (Berry and Berry 1976:29); "engraved stone" (Hunt 1960:267; Perkins 1967:12); and "etched stones" (Jennings 1957:219; Mock 1971:134; Rudy 1953:138; Steward 1937:85).

Numerous reports detail aspects such as material, shape, nature of the incisions, possible associations, and occasionally weights and measurements (see references in Klimowicz 1988). However, several authors do suggest possible functions for the incised stones. One functionalist interpretation suggests their use as gaming pieces (Fowler and Matley 1978:31; Plew 1976; Perkins 1967:12); another suggestion is that they were related to some ritual or ceremonial function (Heizer and Krieger 1956:69; Johnson 1966:12; Mock 1971:134; Perkins 1967:12; Thomas n.d.:2). Moriorty (1982:85) expands on the ceremonial suggestion by saying that they were used in healing and rites of passage ceremonies, and that designs on the incised stones duplicate designs on petroglyphs. Osborne (1957:65) has a different idea as to their usage when he suggests that they were "guardian spirit effigies;" he proposes that they were small flat "statues" made to represent spirits, and images on the plaques need not be recognizable since they were only representations of known animals, or beings seen in dreams. McKee and Thomas (1972:85; also see Santini 1974:14; Ritter 1980:105) suggest that the stones are in some way related to hunting activities and were carved by many different hunters. Another group of authors suggests that they were boundary or trail markers (Parkman 1981:289; Tuohy 1967:8). Pilling (1957:6) proposes their use as either an artist's "sketch pad" before the making of petroglyphs, or perhaps even portable petroglyphs, sharing a social function in common with the immobile ones; he also suggests that incised stones may be some type of charm or fetish. Thomas (1976; see also Ritter 1980:105) hypothesized that they may be calendric markers for times of the year when seasonal foods would be available, or schedules of important social events. Trudy Thomas (n.d.:2) proposes an utilitarian usage, including the possibility that some were sharpening stones.

A second interpretive approach sees representational designs on the stones. Elsasser (1978:73) suggests

FIGURE 1



Incised stones from the Santini Collection, Nevada State Museum. All specimens from southern Nevada.

that the incisions resemble "crude human faces, or perhaps masks" which relate to humans or spirits in some way. Another popular suggestion is that the designs on the stone surfaces represent "clothing or body ornamentation" (Holliman 1969:23; Schuster 1968).

A final approach is not to interpret at all, but rather to suggest that the objects are simply problematical and their function is unknown (Bennyhoff 1957:28; Harrington 1957:69; Huntley and Nance 1979:8; King 1981:48; Loud and Harrington 1929:108; Mock 1971:134; Steward 1937:77; Wallace and Taylor 1955:362).

There are obviously many interpretations to choose from, but as of yet nothing is available that can be tested using the archeological record. None of these "interpretations" explain the apparent regional differences of designs.

A Comparison of Sites With Incised Stones

In order for an analysis of designs to be more useful, it is necessary to correlate site locations with different design characteristics, to see if in fact distinct style zones do appear (see Klimowicz 1988). A further exploration of information about sites may then be useful in order to determine if there is any possibility for model building based on the site types and features located within the possible design zones.

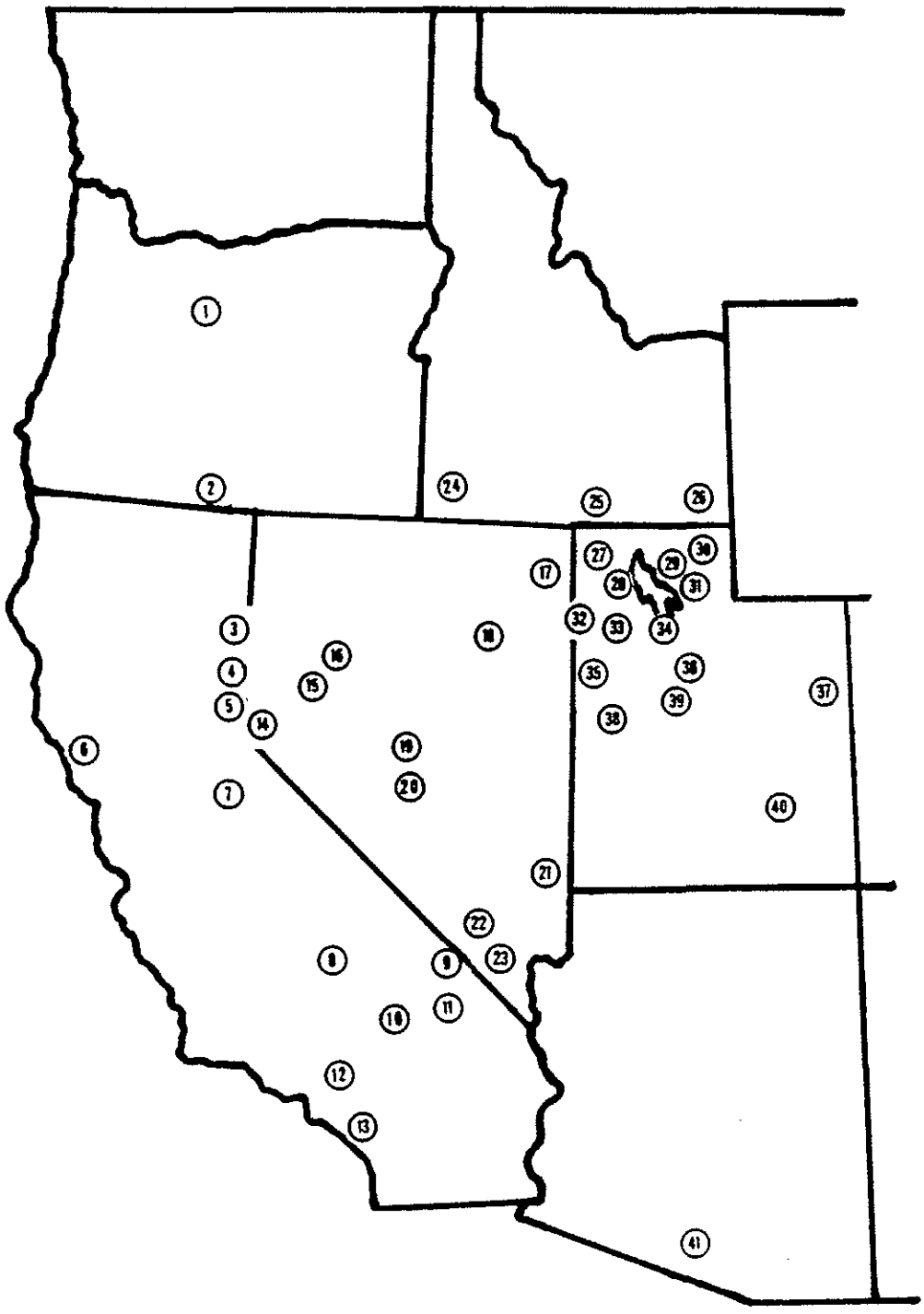
I examined published reports of 46 sites that contained incised stones, and I compared features of the sites in order to gain a better understanding of the places where we might expect to find incised stones. I also collected data on the types of artifacts with which they are usually (or rarely) associated. The comparisons may help to build predictive models. Features that were examined include: the type of site, such as open-air, rockshelter, or cave, and whether the stones were in surface or stratified context; presence or absence of ceramics at the site; presence or absence of basketry; location of the site by state; Carbon-14 dates, if they were available; projectile point styles within the same context as the incised stones; presence or absence of hearths, grinding stones, and faunal materials; and some descriptive information about the incised stones themselves, such as how many were found, type of incising that was done, and identifiability of design, size, and material.

Location

From the published materials examined, I found that incised stones occur in every state of the Great Basin (Utah, Nevada, California, Oregon, Arizona, and Idaho) and outside it. I examined 45 single-site reports. In the majority of publications that I examined, California was most often represented (37.7% n = 17), with Utah second (31.1% n = 14), Nevada third (15.5% n = 7), Idaho fourth (8.8% n = 4), Oregon fifth (4.4% n = 2), and Arizona last (2.2% n = 1) (see Fig. 2).

The published site reports may not accurately reflect the actual archeological record of documented sites with incised stones in them, since unpublished technical reports were not examined. Also some states

FIGURE 2
Distribution of Incised Stones



For detailed references see Klimowicz (1988).

have had more archeological field work done than others, so the proportions of archeological remains may be subject to change in the future.

Types of Sites

Three "types" of sites were examined: open-air sites, rockshelters, and caves. The reports also indicated whether or not incised stones were surface finds, or located within stratified layers.

The possibility that significant information has been overlooked in unexamined professional technical reports may or may not be a significant weakness in my analysis. However, I believe that Fig. 3 reliably represents the "types" of sites at which the majority of Great Basin incised stones are located. The largest percentage of incised stones are found in open-air sites (60%), while cave sites represent a little over one-quarter (26.6%) of the sites. If caves and rockshelters are combined into a single category, they represent less than half of the sites (40%) containing incised stones.

Artifacts From These Sites

Six types of artifacts besides the incised stones were examined for their presence or absence. They include: ceramics, basketry, projectile points, hearths, grinding stones, and faunal material (utilized for dietary as well as decorative or other purposes). The artifacts were included in the list only if they were found in clear stratigraphic association with incised stones.

Three types of ceramics are found in the Great Basin: Anasazi, Fremont, and Shoshone/Paiute wares. The Shoshone/Paiute wares were represented most often in the sites (almost one-quarter of the sample had them, 24.4% n = 11), and Fremont wares were the next best represented (15.5% n = 7). Puebloan wares were found in a small proportion of sites (4.4% n = 2). These data may be biased by the size and locations of the samples.

Basketry in the sites was divided into three types, although distinctive techniques were not closely examined. The three types are Lovelock wickerware, twining, and coiling. Since the majority of the Great Basin groups did both twining and coiling, depending on the use of the object, only the prevalent technique preserved is represented within this sample. These data may be biased by differential preservation, and small sample size. Coiling is represented in the majority of the cases (22.2% of the sample n = 11), with twining second (17.7% n = 8), and only two examples of wickerware being represented (4.4% n = 2).

One artifact class which occurred in high frequency in the sites was grinding stones, occurring 66.6% of the time (n = 30). Faunal materials were also well represented in the sites, with decorative and utilitarian items made from bone found in 51.1% (n = 23) of the sample and unmodified bone in 42.2% (n = 19). Hearths were present at 42.2% of the sites (n = 19). The high incidence of these items and features may indicate that incised stones were found at long-term encampments, or at seasonally visited food-procurement locations. Perhaps incised stones were added to the deposits with each visit. The

FIGURE 3
Types of Sites Where Incised Stones are Found

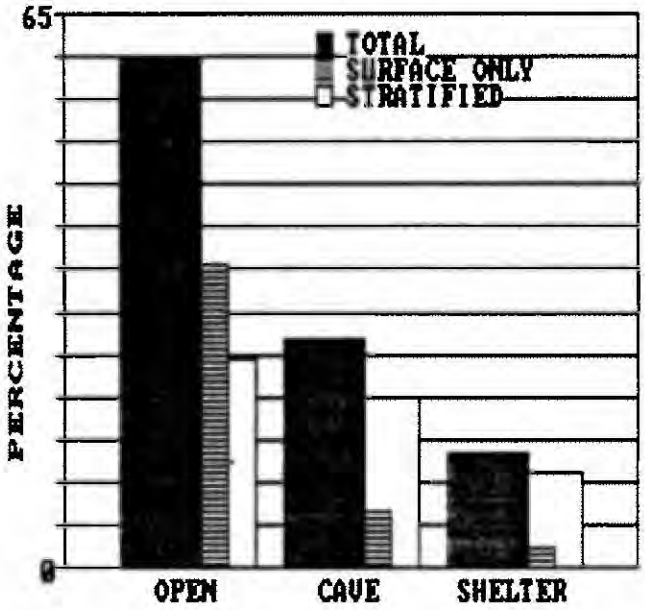
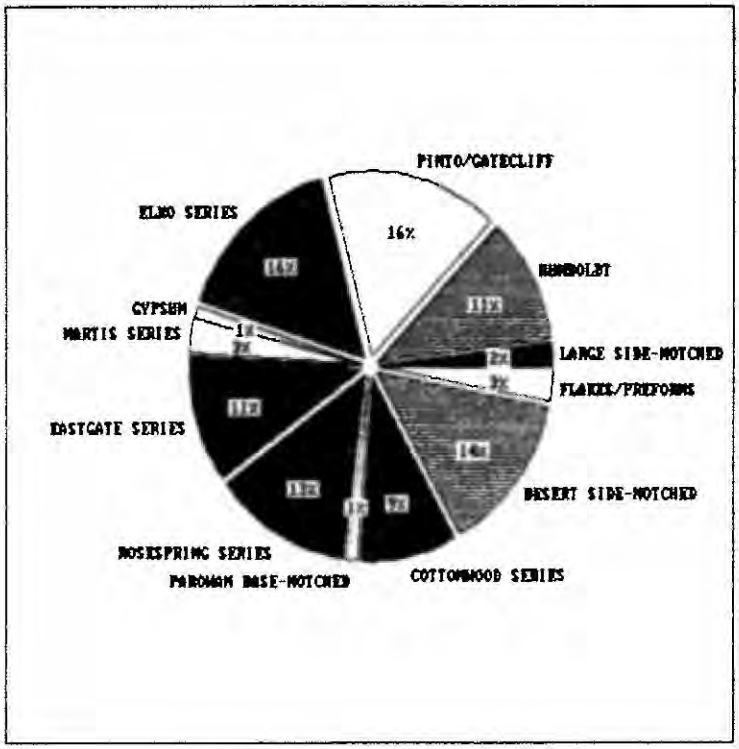


FIGURE 4
Projectile Point Types Associated With Incised Stones In Sample of 46 Sites



large number of grinding stones may indicate preference for food processing camps within the subsistence circuit; the seasonal rounds were most likely similar to those made by the Indians living in the Great Basin during contact times. Thus, within the Great Basin incised stones seem to be associated with living sites, rather than ceremonial or hunting sites. However, in California, they seem to be associated more often with ceremonial and burial sites (Greenwood 1972; Osborne 1957). This may indicate different cultural (or possibly areal) definitions for these objects.

The proportions of projectile points within these sites may not tell us a great deal about temporal placement, because most of the common types used throughout the Great Basin are represented. The outline of projectile point chronology used here is based on Jennings (1986:117). Of the twenty projectile point examples listed by Jennings, twelve were found with incised stones. Judging by the temporal distribution of the Great Basin projectile points, it is possible that the incised stones uncovered thus far in the Great Basin are as old as 8500 years, and as young as about 500 years. Although Jennings defines this range as the pre-Archaic to post-Archaic time period (1986:117), it may be more appropriate to label the periods as Archaic to post-Archaic.

There appear to be two time intervals during which relatively large numbers of projectile points were manufactured (over 30% of the sample from 46 sites). As Fig. 4 indicates, the phases of heaviest concentrations of projectile points occur with the Pinto/Gatecliff Series and Elko Series projectile points (percentages of 33.3% each), and again later with the Desert side-notched projectile points (31.1% of sites containing incised stones). The incised stones located in stratified context within the Gatecliff Shelter also show a high number of stones being manufactured and deposited during these two lithic traditions.

If Eastgate and Rosespring Series points were combined together as a single "tradition," as is often done by archeologists (Elston 1982, 1986), then over half the sites (53.3%) with incised stones are contemporaneous with these styles, indicating a relatively late peak in manufacture around 2500 years B.P. to about 800 years B.P. This time frame seems to be a bit more realistic for surface sites, in view of the fact that relatively soft stones were incised, and weathering processes would have obliterated the incisions if they were of great antiquity.

Thus it appears that roughly half of the incised stones are associated with early types of projectile points, and half with late types.

Characteristics of Incised Stones

The majority of Great Basin sites contain three or fewer specimens on incised stones (Fig. 5). Sites with a single stone are most numerous. Large numbers of stones are rarely found together. A total of twenty-three specimens or more in one site is exceptionally rare.

Stone shape appears to be very important to the makers. Sixty-four percent (n = 36) of the sites in the sample contained flat, tabular pieces. This may have been the preferred shape, because flat

FIGURE 5
Frequency Distribution of Numbers of Incised Stones
Found Together In Single Sites

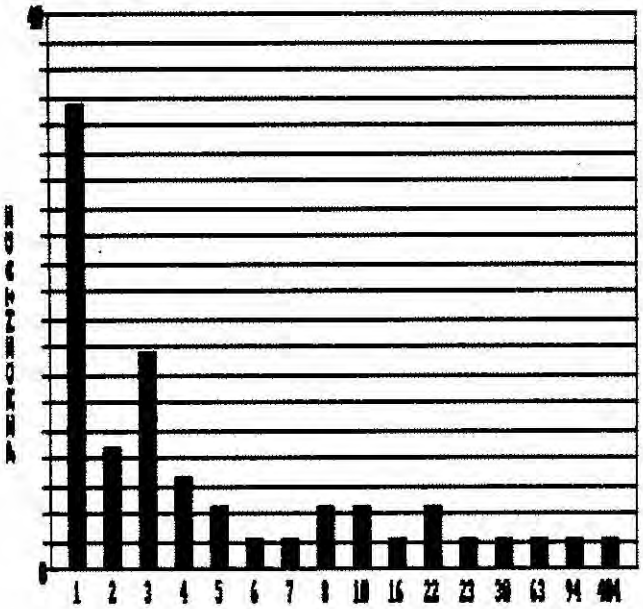
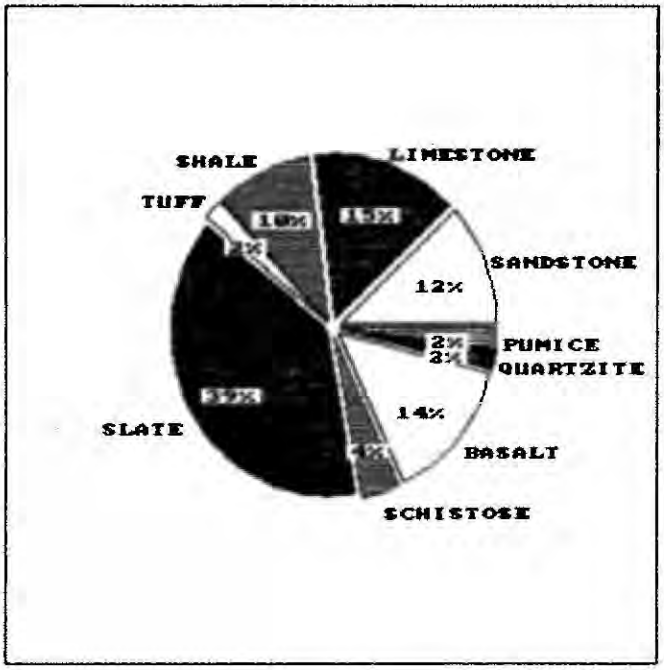


FIGURE 6
Frequency of Raw Materials Selected For Incised Stones



surfaces were much easier to work. Pebbles or rounded stones were less preferred but were still utilized in 27.0% of the sites (n = 15). Shaping the exterior dimensions of the stones does not appear to be very important since it was done in only 9.0% (n = 5) of the sites.

Composition or overall design was another aspect I attempted to examine in the published site reports. Unfortunately most of the stones were not illustrated so it was difficult to tell from written descriptions what type of composition the stones might have. The sample was broken down into two groups: those with apparent design composition and those with no apparent design composition. 50.7% (n = 36) of the sites had incised stones which showed definite composition. About one-quarter (29.6% n = 21) had stones with no apparent composition, or in other words, random markings. In many of the sites (19.7% n = 14) some stones showed obvious composition and some had no apparent composition at all; however, stones that have definite designs represent more than half of the specimens examined in the literature.

Incising technique includes three possibilities: straight lines, a type of zigzag or rocker line drawn within a straight line, and a type of dotted lined spaced at regular intervals. The straight lines were used most often. In 75.5% (n = 34) of the sites, straight lines were used to incise stones. This may indicate the ease with which this technique could be applied to the surface of a stone. The zigzag or rocker technique was used in only 22.2% (n = 10) of the sites, though it was not always used exclusively; more often than not it was combined with the straight line technique. The zigzag or rocker technique involves the application of a type of zigzag line which appears to have been made by rocking the incising tool back and forth along a straight line. The dotted line technique appeared in only two sites (4.4%), both from Utah, making it the rarest design application used; also, the stones from these sites appear to be surface-prepared. The dotted line technique was applied to the surface of the stone in short straight lines, with the incising tool being picked up off the surface of the stone and applied again at regular intervals.

Incised stones were associated with burials in only two cases (4.4%), and were suggested to be part of a "shaman's cache" both times. Ochre was applied to the surface of the incised stones in just over 10% of the sites (11.1% n = 5).

Nine different raw materials were used within 45 sites, with the preferred material being slate (see Fig. 6). Limestone, basalt, sandstone, and shale, as well as some other materials used less often, were selected in varying frequencies. The materials used in the manufacture of incised stones were all locally available materials. No raw materials were imported for the manufacture of these objects.

Conclusion

It is necessary to look at more than just the objects themselves so that we may begin to understand the significance of incised stones in the archeological record. This survey is intended to provide insights about the antiquity of these objects, the places where they

are found, and the types of artifacts they are found with. There appears to be a preference for an ordered design application to the surface of the stones. This implies that the designs are intentional, and are not simply the result of unplanned, haphazard marking episodes. The designs are rule-based (see Klimowicz 1988 for further discussion), and these rules are important to uncover, so that we can begin to understand the place these artifacts had in the day-to-day lives of their makers.

Acknowledgements

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The Nevada Archaeological Association was organized in 1972 to provide a bond of communication between professionals in the field of archaeology and its allied sciences, members of various amateur organizations, and the people of Nevada towards the furtherance of public education and involvement in responsible preservation of Nevada's finite archaeological and historical resources.

The need for recording these cultural resources of the past for the enlightenment of future generations grows more pressing with each day of development and progress. The goals of the Nevada Archaeological Association are: to provide a focal point for general information and study of non-renewable cultural resources; to provide a central point for recording artifact collections from Nevada and the Great Basin and the verbal knowledge of provenience and associations accompanying these collections; to correlate this knowledge with that information already professionally recorded for the mutual benefit of the amateurs and professionals with research interests; to provide assistance with education towards responsible public participation in archaeology; to assist in the preservation of sites by the establishment and maintenance of a registry of available, capable, and technically skilled amateurs in Nevada who would be able to work with professionals in accordance with the Code of Ethics and Standards of Research Performance as advocated by the Society of Professional Archaeologists, particularly in the immediacy of salvage archaeology; and to provide a bond of communication between professionals, amateurs, and the general public by publishing a journal, *Nevada Archaeologist.*

To these ends the Nevada Archaeological Association was incorporated in 1972, in the State of Nevada, with its organizational and editorial offices as listed on the inside cover. Membership is open to all those interested in the archaeology, ethnology, and history of the human inhabitants and their natural habitats in Nevada, the Great Basin, and adjacent environs.

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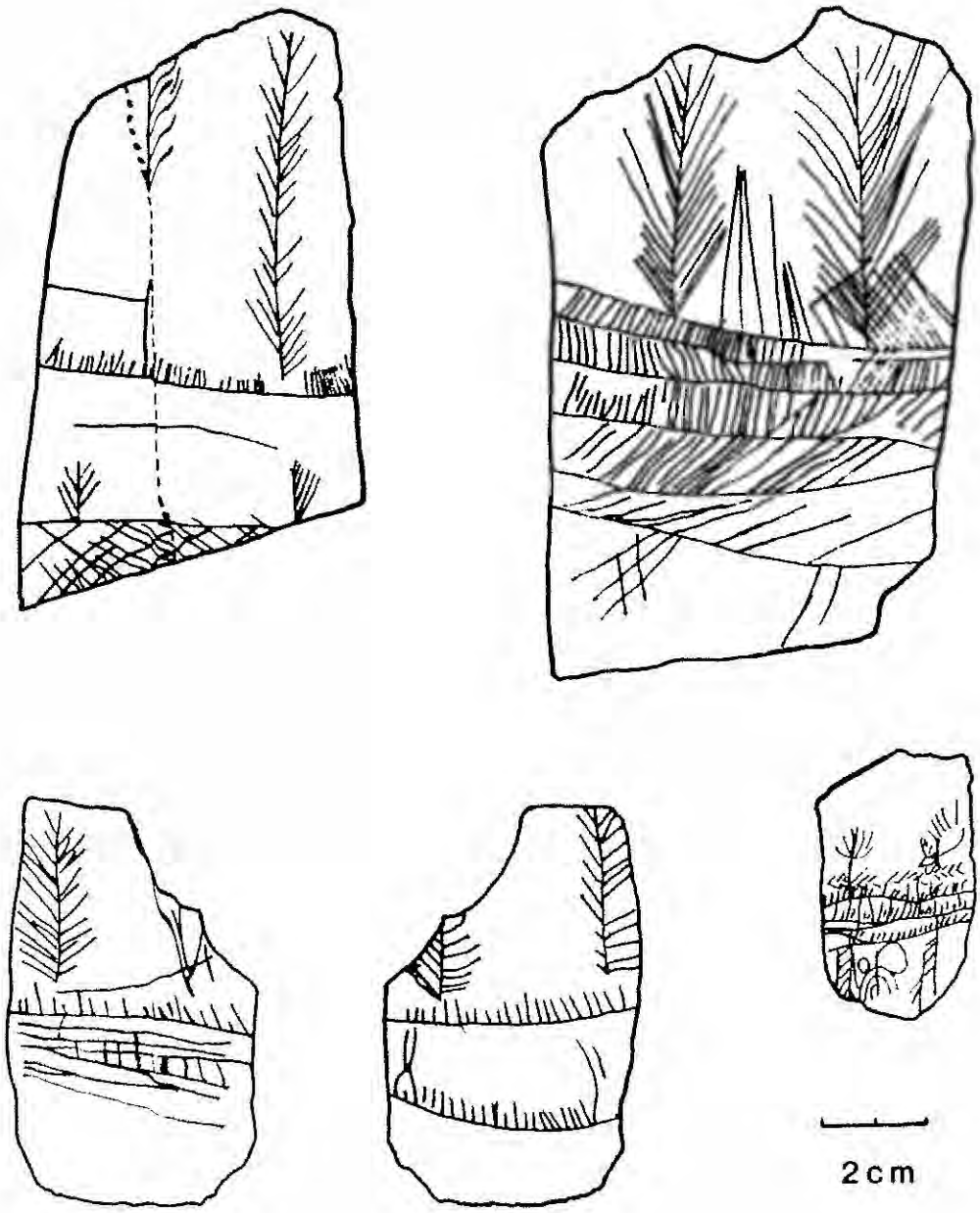

Incised stones from the Santini Collection, Nevada State Museum
(see article by J. Klimowicz, page 28).