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Mark G. Plew, Editor
IDAHO ARCHAEOLOGIST
Department of Anthropology
Boise State University
1910 University Drive
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Cover: Hunting Knife from Lyon County, Nevada.

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ARTICLES AND REPORTS

METAL ARROWHEAD TYPES AND OTHER SHARP-POINTED METAL OBJECTS, HUNTING KNIVES, FOUND IN NEVADA

by Donald R. Tuohy

ABSTRACT

In a recent paper Arkush (1990) has outlined a Protohistoric period for the western Great Basin which he says lasted from A.D. 1700 to 1850. He used the distribution of glass trade beads among others to bolster his position on the Protohistoric in the western Great Basin. By the 1990s there is enough information on the Protohistoric that we should pin it down in time and in distribution. This paper deals with metal arrowhead types and other sharp-pointed metal objects (knives) which would support the Tybo Phase* for the western Great Basin.

INTRODUCTION

This paper is centered on metal arrowhead types and metal hunting knives found in Nevada and mostly housed at the Nevada State Museum. There are five metal-tipped arrows, three unshafted metal arrowheads, and three metal hunting knives to be considered in this paper. There are also three additional arrows with metal arrowheads in the Nevada State Museum collections, but these are of very recent manufacture, and so they are not considered here.

A similar paper from Idaho was written by Don Crabtree (1968:38-40) who examined metal artifacts in the form of arrowheads, knives, and bangles from a site near the Oregon Trail in south-central Idaho. These 43 metal artifacts were used to manufacture metal points and metal tinklers or bangles along the Old Oregon Trail. Two other metal points were found in Swiss Valley near King Hill, Idaho (Plew 1989:17-18). These metallic artifacts Crabtree (1968:38) says are evidence of acculturation along the Oregon Trail (Figure 1).

More evidence for acculturation in the Protohistoric period from the Great Basin was presented by Brooke Arkush (1990:28-29) who says that the horse, a plethora of Old World diseases and a variety of mass-produced items should be included as evidence. Among the latter, Arkush (1990:29) includes utensils, knives, axes, awls, fishhooks, arrow points, glass beads, blankets, western clothing, and firearms. Although Arkush (1990:31) traces the distribution of glass trade beads in the western Great Basin, more knowledge of the distribution of the above items are necessary before we can master the Protohistoric period in the Great Basin. We will discuss this point further at the conclusion of this paper.

*I was the first one to use this name to represent the Protohistoric in the Great Basin. That name was also used by Roberta McGonagle and Lynda L. Waski (1978) for historic phase sites in the Tonopah Region. I suggest we use the name for the Protohistoric and Historic periods in the western Great Basin.

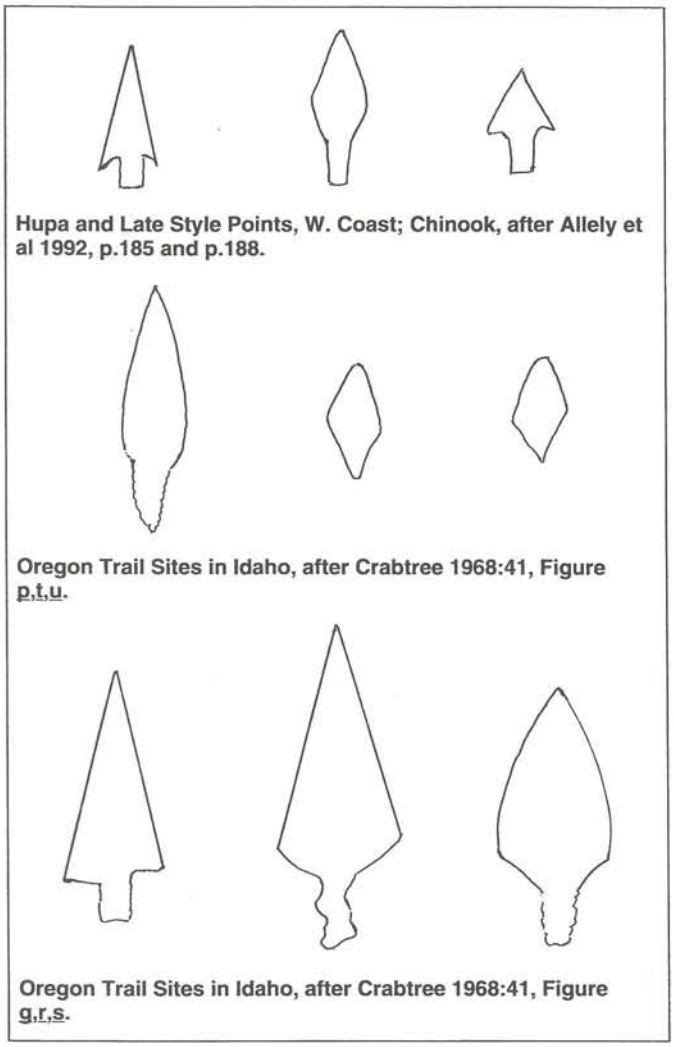
ETHNOGRAPHIC USES OF METAL ARROWHEADS IN NEVADA

The use of metal to make aboriginal arrowheads was well underway by the middle of the 19th century. Metal was available on both coasts. The spread of metal objects northward began with the expansion of the mission system in San Diego, California, in 1769. It was seven years later when the British colonies in the eastern United States won their freedom to become the United States of America. We do not know which source of metals was used to make the first metal-tipped arrowheads. We suspect that both sources of metal were used. The Paiute and Washoe words for "iron" were also the same for "knife" (Collins 1860:470).

As Joel Janetski (1981:191) says about the Shoshoni Indians who occupied Elko and White Pine Counties (James, Steven R. 1981:149-209):

> "By the mid-19th Century trade goods were available to the Nevada Shoshoni who began using metal to tip their arrows. Jedediah Smith saw "some iron arrow points and some beads" among either Southern Paiute or Shoshoni on the east slopes of the Snake Mountains in 1827 (G. Brooks 1977: 184). In 1846 Bryant (1967:195) encountered Shoshoni on the Humboldt "armed with bows and well-filled quivers of iron pointed arrows."

Metal arrowhead types for the *southern* Great Basin are listed in a study of 20 out of 174 arrows collected by John Wesley Powell from 1867-1880 (Fowler and Matley 1979:65). The authors note that two forms of iron points were utilized there, triangular and diamond shape. The authors also note that one blunted brass rod was used to



Hupa and Late Style Points, W. Coast; Chinook, after Allely et al 1992, p.185 and p.188.

Oregon Trail Sites in Idaho, after Crabtree 1968:41, Figure p,t,u.

Oregon Trail Sites in Idaho, after Crabtree 1968:41, Figure g,r,s.

Figure 1. Metal arrowheads from Idaho, and from the west coast of North America.

make a metal point 58mm long and 3mm in diameter (Fowler and Matley 1979:65). Other brass points have been found in Idaho (Plew and Meyer 1987:17-18) and in Wyoming (Willingham 1991:11-13). So both iron and brass were used to make metal tips to arrows in the southern Great Basin.

For the northern Great Basin there are two instances where metal arrowheads were utilized in Nevada, one in A.D. 1860 and the other in A.D. 1911. Let us examine these two. We will deal with the 1860 case first.

During the Twentieth Century, whenever the Pyramid Lake Paiutes needed quick cash, they would sell their antiques to Nick Jackson who ran an Indian trading goods store in Reno, Nevada. Nick Jackson would take down whatever the Indians told him about the artifacts in question. In 1963, Mr. Jackson wrote a thirty-page article (with illustrations) which he gave to the Nevada State Museum. In his article, there is a picture (Figure 2) of six items purportedly belonging to old Chief Winnemucca. Among the artifacts were Winnemucca's ceremonial tomahawk, a buffalo war club, a Hudson Bay tomahawk-pipe received from Winnemucca's brother by white trappers circa 1825, a "pepper box" pistol taken from the body of a "white volunteer" during the war of 1860, a .50 caliber pistol taken from "a soldier" in the Ormsby massacre during the same war, and an arrow with a metal tip, taken from the body of a "white volunteer."

Although the hype is awfully strong in the stories attached to the artifacts, particularly with reference to the Plains Indians artifacts (Steward 1939:1), the buffalo war club and the Hudson Bay tomahawk pipe, there must be a grain of truth in the stories. It is thought that a "pepper box" pistol was used in Ormsby's massacre (Angel 1881) and Nick Jackson's metal-tipped arrow could have been recovered "from the body of a white volunteer." We will accept the informant's story at face value, knowing full well that the steel-tipped arrow could have been made earlier or later than the first battle of the Pyramid Lake War of 1860 (Figure 2).

The second instance of ethnographic uses of metal arrowheads occurs in the story of Shoshone Mike. He was the instigator and leader of the last Indian battle fought in Nevada and the United States in 1911 (Mack 1968). Shoshone Mike's band, consisting of his extended family and friends, were killed near Kelley Creek in Pershing County, Nevada, after having slain four Nevada Stockmen in the Little High Rock Canyon early in 1911. The Indian dead totaled eight, four adult males including Shoshone Mike Daggett, two females and two teen-age boys. Only a teen-aged Shoshone Indian girl, Heney Daggett, and three of the youngest children, all under ten years of age, survived the battle (Mack 1968:104-105).

Among the captured items in Shoshone Mike Daggett's band, according to Mack (1968:118) were the following:

> "All of their tools were of the crudest manufacture. They had made bows and arrows and had steel points on their arrowheads. Their long-handled spears were willow pole shafts with sharp-edged sheep shears' blades fastened to the ends. The crudely made tomahawks, two and one-half feet long, were made of steel with wooden handles. The two home-made drums and Mike's feathered bonnets were also picked up."

One of the arrows from Shoshone Mike Daggett's band is shown in Figure 3. It was said in Mack's story (1968:88) that a boy of about ten years old used a steel tipped arrow as an offensive weapon. He used it to stab . . ."at their (the posse's) horse's shoulders" until he was captured.

The Nevada State Museum presently has only one Shoshone Mike Daggett's steel-tipped arrow in its collection. It is in the Dr. Samuel Lee collection and obtained by him from Sergeant Stone of the Nevada State police in 1911. Dr. Lee paid $2.50 for the collection, which was given to the State Museum in 1940.

The length of the Shoshone Mike arrow is 21.2 cm; it is the shortest arrow in the NSM collection. The number that was assigned to it is 38-G-1373c. The wooden arrow shaft is thickest in the center, 7 mm in diameter, and it diminishes from that figure towards both ends. The pointed end is split to receive the metal point. The metal point is triangular in shape and is 2.1 cm long. The stem is serrated and it extends for 1.0 cm into the arrow where animal sinew binds it to the arrow (Figure 3). The feathered portion of the arrow takes up 7.5 cm of the shaft. The feathers are three split portions of eagle tail feathers,

mounted inside out and radially. On both ends the cut magpie feathers are attached with animal sinew. The tail feather section of the main shaft is painted with black bands surrounding a 1 cm wide red ochre coloring. The nock end of the shaft is also similarly colored with red ochre preceded by three black bands.

This ends the description of one of Shoshone Mike's metal tipped arrows, and we shall continue with the descriptions of three other archaeologically occurring metal-tipped arrows within the Nevada State Museum collections.

Figure 2. Artifacts in the Nick Jackson collection, including one steel-tipped arrow.

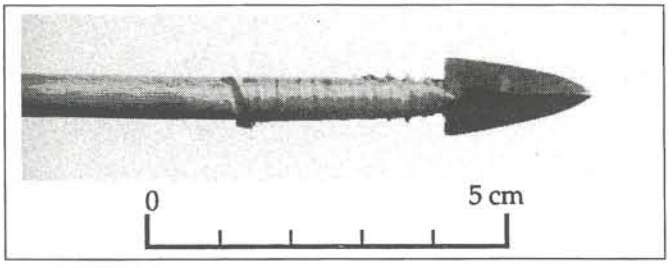


Figure 3. One of the steel-tipped arrows used in the battle with Shoshone Mike Daggett's band.

ARCHAEOLOGICAL OCCURRENCES OF METAL POINTS IN NEVADA

No study of metal arrow points as they occurred in pristine sites in Nevada has ever been undertaken. It is almost too late now to trace the route of the Humboldt Emigrant Trail as many of the emigrant's camp sites were located on or near what is now a principal automobile route, Interstate 80. The chance of finding a site similar to the one Crabtree (1968:38-42) reported on the Old Oregon Trail is extremely remote. A metal workshop in Nevada of the type reported on the Old Oregon Trail would have been picked apart years ago.

There are seven metal arrowpoints still hafted to cane arrows in the Nevada State Museum collections. I will describe four of them as the other three were made in recent times (1960s). The first two are from the Howard Parish collection from Reno, Nevada. The first one is 691-G-249. It has a metal triangular point that is 3.8 cm wide and 1.3 cm thick. It has two backward-trending barbs on it, and the metal shaft is 4 mm wide and 3 mm in thickness. The whole metal point is 7.7 cm long at a point where it enters the wooden shaft. The wooden shaft itself is cane and averages about 7 mm in diameter. The overall length is 88 cm and the feathered portion of the arrow covers 20.5 cm. Three olive-drab tail feathers, turned inside out, constitute the tail of the arrow. Only one marking is present and that one is a red band encircling the shaft at the first mode, 4.8 cm from where the metal point enters the cane shaft. Even though Howard Parish lived in Reno, it is hard to know where this arrow came from; we think it is *not* a native Great Basin arrow. We think this one is a Sioux arrow.

The second arrow is also from the Howard Parish collection from Reno, Nevada. It is 691-G-250. It has a metal, diamond or lozenge-shaped point that is 6.7 cm long, 3.3 cm wide and 4 mm thick where the metal shaft enters the cane shaft. It has no barbs. The entire arrow is 91.5 cm in length and the cane shaft varies from the thickest mode at 1.0 cm near the point down towards the tail which is 0.7 cm in diameter. The feathered portion of the arrow extends for 24 cm from the nock. It is here that radial eagle feathers are attached. They are also turned inside out and wrapped with bark sinew at both ends. The metal arrow point was also affixed with bark sinew held together by pitch. This arrow, like the first one in the Howard Parish collection, may not have been found in Nevada.

The third arrow with a metal point was made in modern times. It has "HNS 18 A" on it and the museum number is CM-4103-G. It is a much shorter arrow than the other (Parish Collection) arrows, and it is only 73.4 cm in length. The metal point is triangular in shape and it has a grooved base. The body of the arrow is smoothed-off greasewood, averaging around 1.1 cm at the point to 0.9 cm at the nock end. The tail takes up 27.5 cm of the length of the arrow, and it is composed of three trimmed partial segments of eagle feathers. The point and the tail are attached by use of animal sinew. There is also some decoration on the tail portion. The maker used a partially melted crayon of a reddish hue to mark the lower portion of the arrow for a length of 10 cm and the maker used a blue crayon to mark the upper portion of the arrow (in between the tail feathers) for an additional 10 cm.

Unshafted Metal Arrowheads (3), (Figure 4,c), Copper Point (1), No. 3004, (Figure 4,f).

There is one copper point in the Nevada State Museum collection. It was found by Mrs. Margaret (Peggy) Wheat in the Carson Sink. It is triangular in shape with a squared off stem (Figure 4,f). It averages 1.0 mm thick, and it is 3.6 cm long and 1.7 cm wide. It weighs less than one ounce. It has a sharp right angle curve in the stem and in the lower portion of the triangular-shaped point to facilitate hafting it to the arrow shaft.

Steel Point (1), (Figure 4,c).

One steel projectile point was found by Jane Bowden approximately one mile north of Lovelock Cave, Nevada.

It was photographed and returned to the finder in 1969. It was triangular in shape and it had a sharp pointed stem. The point end was in poor shape having been exposed to rust. It was 3.5 cm long, 1.28 cm wide and 1.5 mm thick.

Although steel wagon-wheel tires were reported to be the sources for the steel arrowheads (Figure 5), they would have to be mighty thin to be made into arrow points. I think barrel hoops and other thin sheet metals were used more often than steel wagon tires.

Knives, (3), (Figures 6,7, and 8).

The use of iron or steel to make knives as well as arrow points is well known in the Great Basin (Malouf and Findlay 1986:512, Figure 8, g,h,i,). The finding of an aboriginal brass knife from the Teton Range in Wyoming (Willingham 1991:11) represents a "high country adaptation" for the last 3000 years in that area. The three knives that were found in Nevada reflect a 19th (and a 20th) Century interest in that weapon. A good knife could be used for skinning any kind of game and for defensive purposes against any kind of foe, including two-legged ones. The Virginia Range with its Virginia City was the place to look for lost knives. In its earlier years prospectors lived in the hills in tents or any kind of shelter they could find or make.

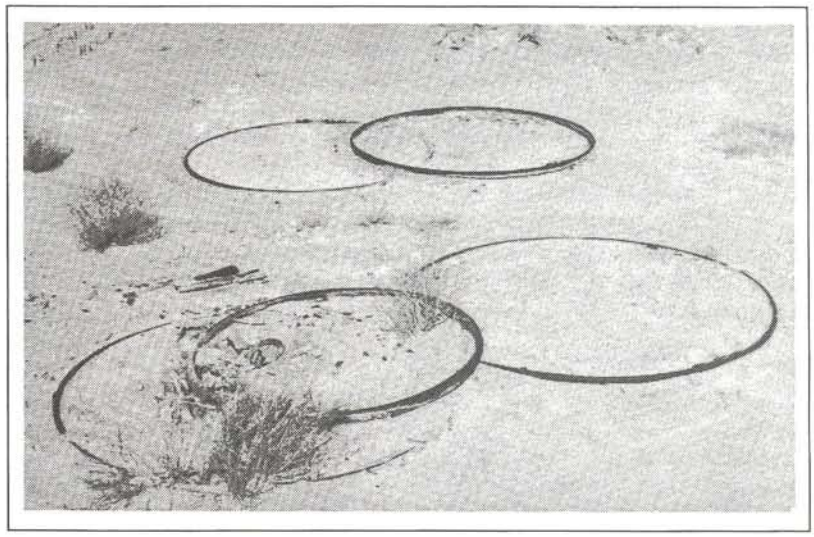


Figure 5. Steel tires from wagons photographed by Steve Wallmann near Rabbit Hole on the Black Rock Desert of Nevada.

There have been three knives that were reported to the Nevada State Museum in the past ten years or so. The other one, a steel knife blade with a serrated stem, came from the Carson Sink. Let us describe the latter knife first.

Steel Knife Blade from Churchill County, (Figure 6).

There was one steel knife blade found in Churchill County near Fallon, and that one was reported by the late Margaret (Peggy) Wheat. The steel point to the knife was triangular in shape and 8.8 cm in length and 2.0 cm in maximum width. It was a double-bladed knife. Both blades tapered to the point in front, and at the back end. There was a serrated stem 2.0 cm long by approximately 1.0 cm wide, making the total length 10.8 cm. The steel knife blade could have been used as a point as the stem was small enough, under 1.0 cm, to be hafted to an arrow.

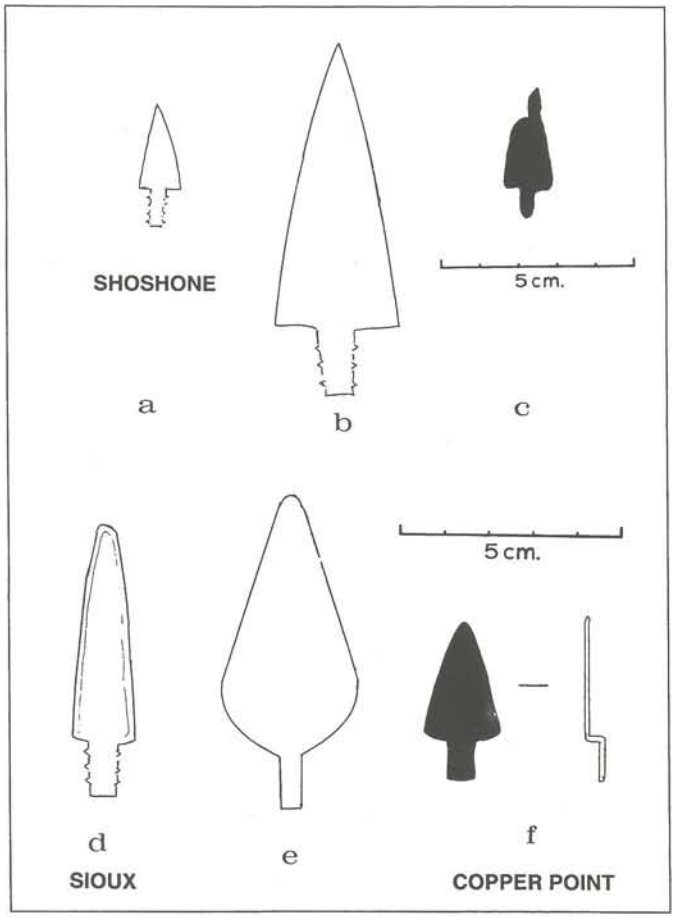


Figure 4, a,b,c,d,e,f. Metal arrowheads found in Nevada; a, b, d, and e are attached to the shafts, and have been described in the text; c, f are unshafted metal arrowheads from Nevada.

Hafted Steel Knife with a Wooden Handle from Lyon County,(Figure 7).

There was one hafted steel knife in its own scabbard which was brought to the museum in 1984. The steel knife had a double-pointed blade and its own hand-made wooden handle. The knife was 26.3 cm long and 2.8 cm wide. The homemade scabbard made to just fit the knife blade was wrapped with sinew around the top. The scabbard was made of pigskin and it had designs upon it. I was able to make out the designs and they were: a rising sun, an upside down tepee, and an hourglass. The knife and the scabbard are shown in Figure 7.

Complete Steel Knife With Two-Part Bone Handle, Lyon County, Nevada, (Figure 8).

The third hunting knife was found sticking in a ditch near the Sutro Tunnel in Lyon County, Nevada. It had a two-piece handle; the lower part of the body was made of wood, and the upper part was made of bone. The upper part of the handle depicted an Indian with a feathered headdress. He had inset eyes, only one of which was left, and the body had three insets representing buttons. Altogether, the handle was 14 cm in length and the

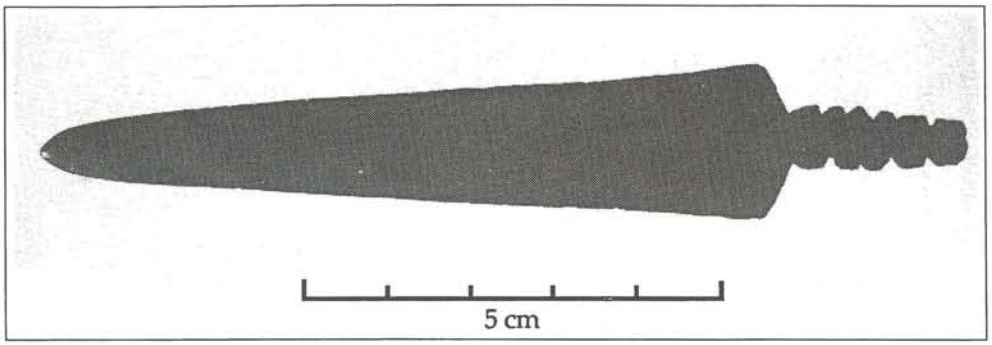


Figure 6. Steel knife blade from Churchill County, Nevada.

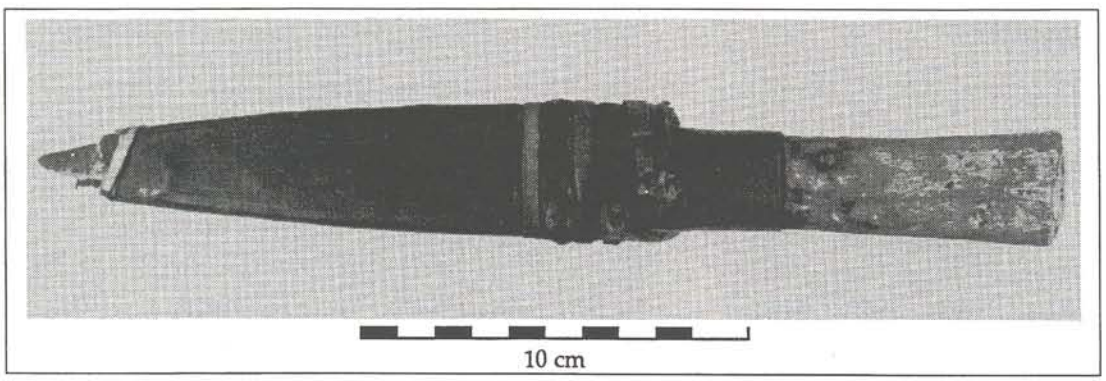


Figure 7a-7b. Hafted steel knife with homemade wooden handle and pig-skin scabbard from Lyon County, Nevada. Figure 7c. Knife and scabbard. Figure 7d. Close-up of scabbard.

Figure 7a

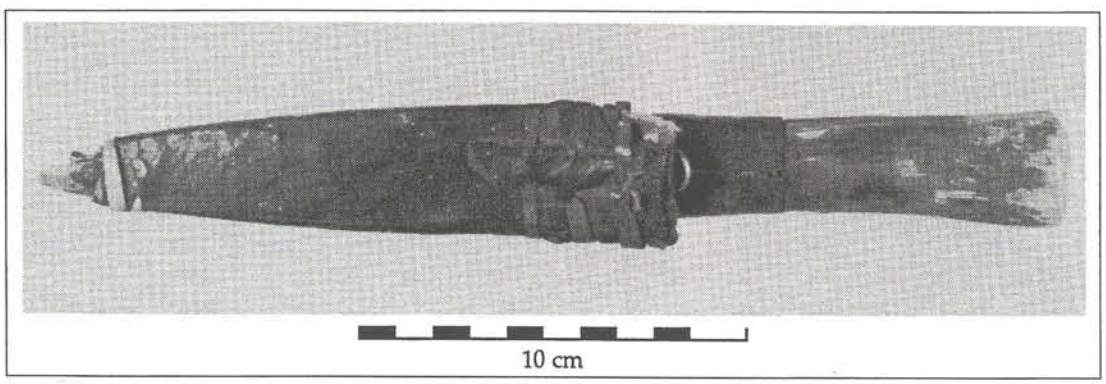


Figure 7b

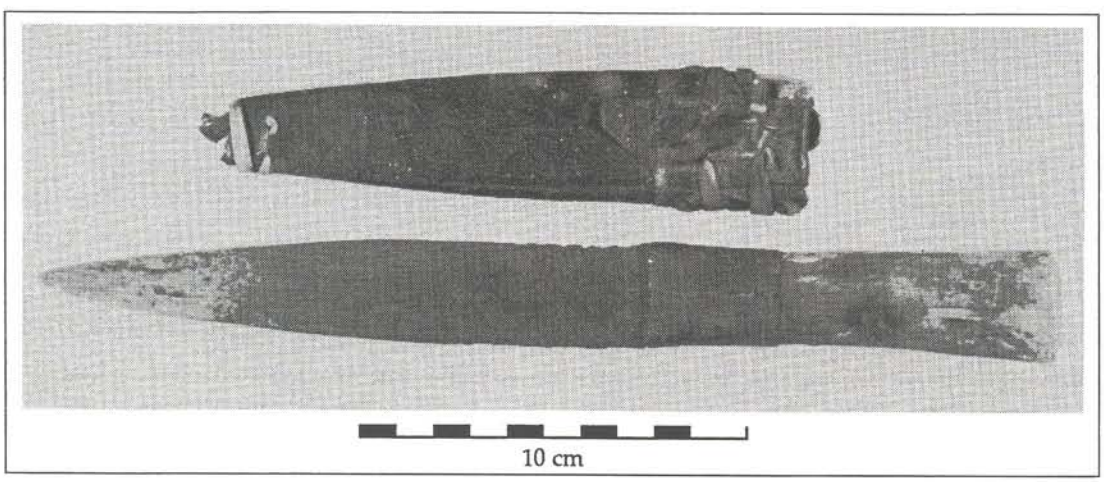


Figure 7c

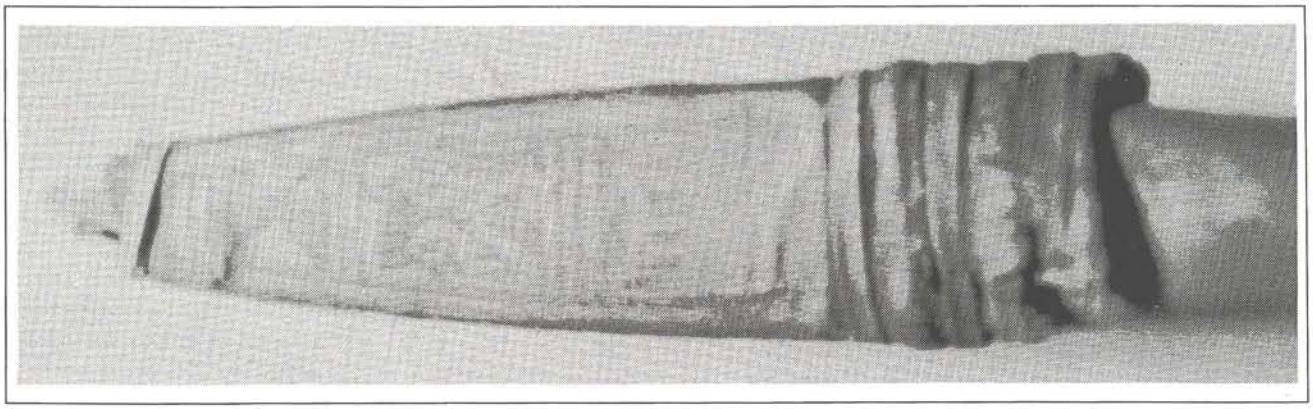


Figure 7d

knife blade was 17 cm in length. The visitor who found it wanted to have it back, so we complied.

CONCLUSION

Other metals have been found in the Great Basin. Two small pieces of copper were reported by Bonnichsen (1964:33) from a cremation site, and thin, narrow sections of rolled copper were found in Hell's Canyon archaeology by Caldwell and Mallory (1967:68). Three hunting knives in use before 1899 in the eastern Great Basin were illustrated by Malouf and Findlay (1986:512, Figure 8 g,h,i), and other metal objects were in use in

Figure 8a

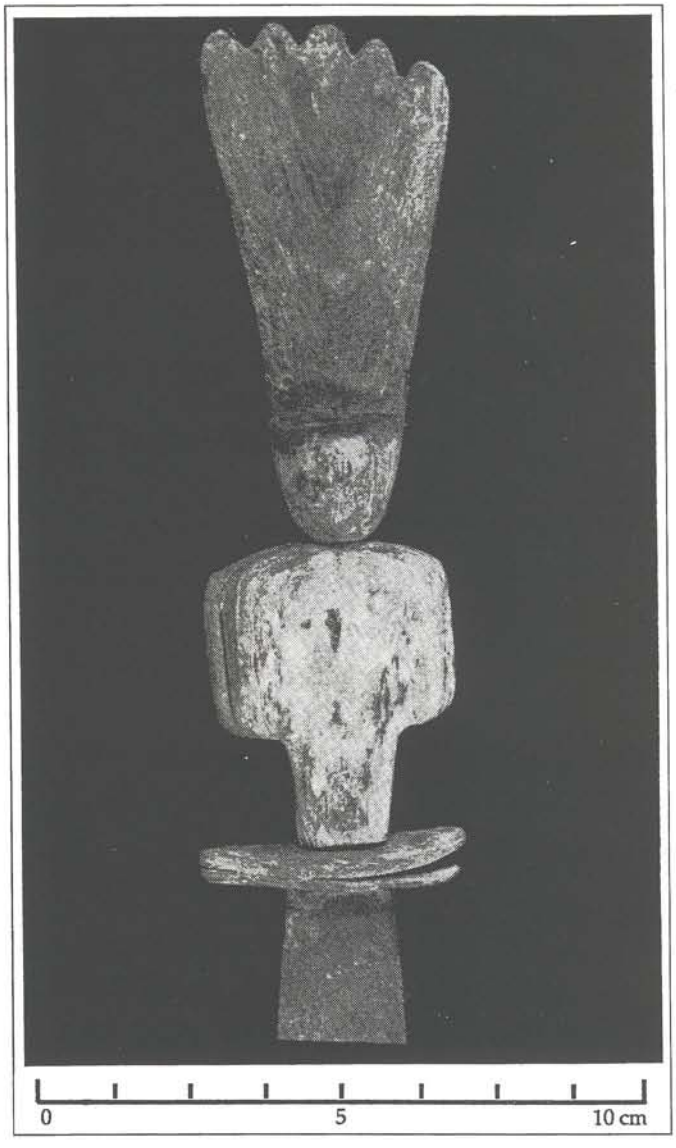


Figure 8b

Figure 8a-8d. Hunting knife found near Sutro, Lyon County, Nevada.

Figure 8c

western Nevada (Shimkin and Reid 1970:180,184 and Tuohy 1984:141-144 and Rusco 1976:152-173) at the same time as agriculture and mining were developing in Nevada.

This brief study has outlined when metal points were last in use in western Nevada. We have *five* steel and iron arrowpoints in the Nevada State Museum collections; three unshafted metal arrowheads including one copper one and *three* hunting knives recorded in the twentieth century. The use of metal for making arrowheads dates to the time before direct contacts were made with the Anglo population. In Nevada, that time period can be divided into the Protohistoric (pre-A.D.1850), and the Historic period (post A.D.1850), which witnessed hordes of gold miners making their way to the Sierra Nevada and the Comstock. I have referred to the Protohistoric period as the "Tybo Period," and so, too, has McGonagle and Waski (1978:38). Their Tybo phase in the Tonopah area dates from A.D. 1863 to A.D. 1911. I would like to call their Tybo Phase the "Upper Tybo Period" in western Nevada and reserve the Lower Tybo Period for the Protohistoric in western Nevada (ca.A.D. 1768 to A.D. 1850).

ACKNOWLEDGEMENTS

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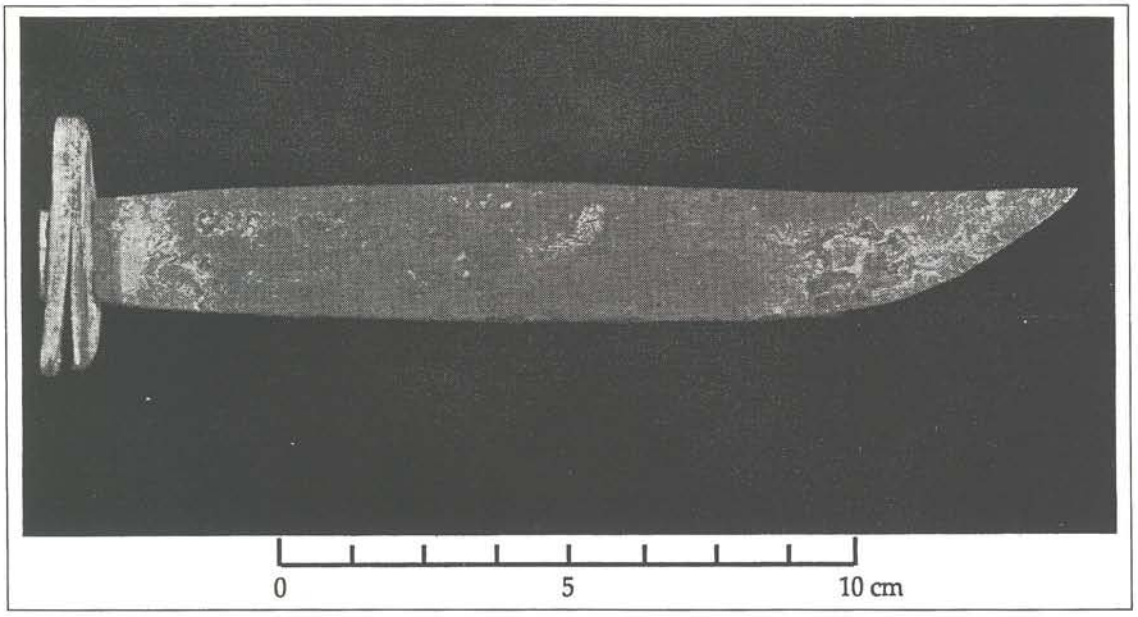

Figure 8d

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SHORT CONTRIBUTIONS

A COLLECTION OF POTTERY SHERDS FROM KING HILL, IDAHO

Mark G. Plew
Boise State University

This paper describes a collection of 196 pottery sherds from the vicinity of King Hill, Idaho (see Figure 1). The collection was brought to the author by Mr. Armond Taylor of Boise. The sherds were collected by an acquaintance of Mr. Taylor some thirty years ago. The collection, though its exact provenience is unknown, is of interest since a somewhat unusual ceramic assemblage, including incised decoration, was recovered at the Clover Creek site at King Hill. (Plew and Gould 1990, see also Plew and Bennick 1990). The collection documents an additional riverine locality where pottery has been discovered. This is relevant to the recently advanced distributional hypothesis positing seasonal use of ceramics in upland and riverine contexts (Plew and Bennick 1990).

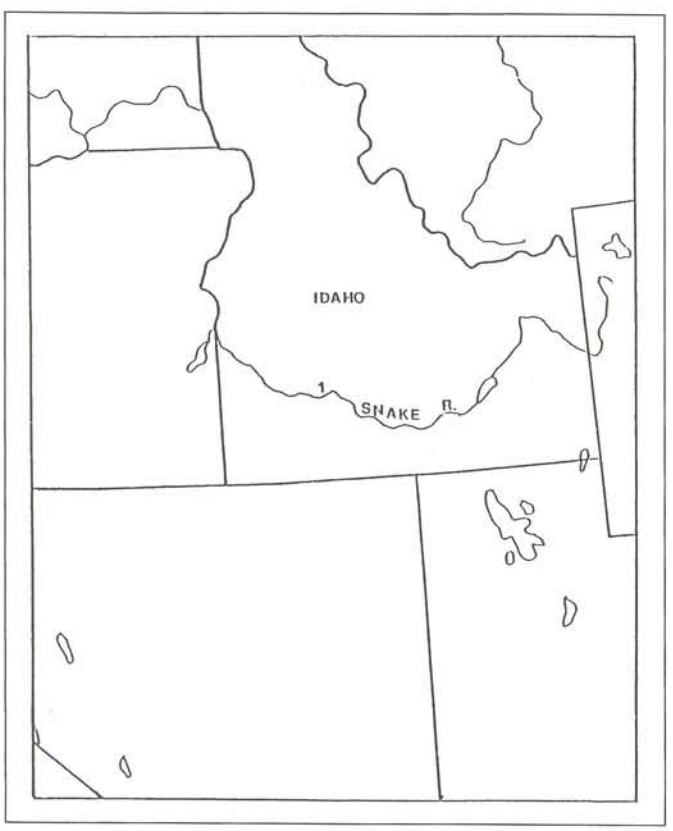

Figure 1. 1. Map showing general location of King Hill, Idaho.

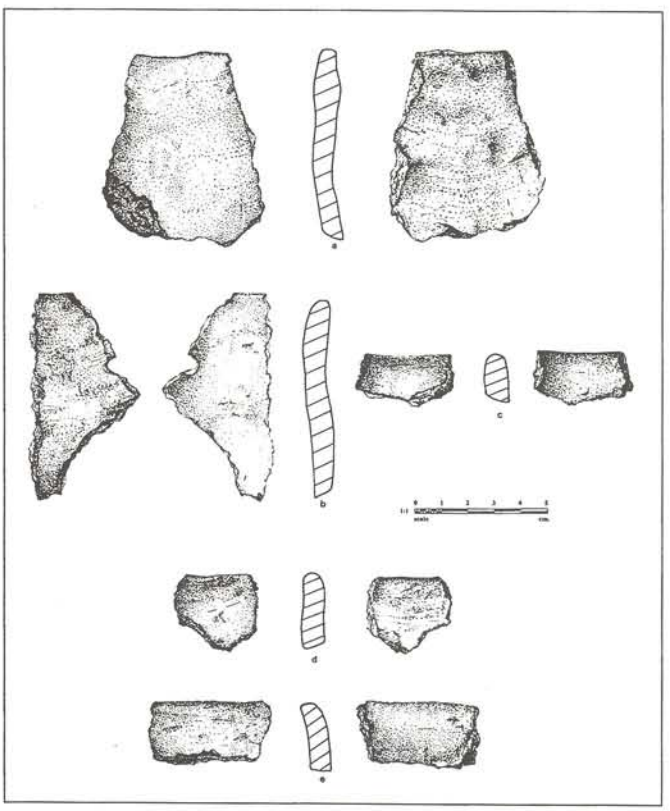

Figure 2. Rim Stance. a-d Vertical Rims; e, Slightly Excurvate Rim.

The past decade saw considerable discussion of the distribution and cultural affiliation of southern Idaho ceramics (Butler 1979, 1986; Plew 1979, 1982). Though the early focus of the discussion related to possible Fremont connections and documented the presence of Fremont and Fremont-like pottery in Idaho, it recognized greater variation within Shoshoni or Intermountain Ware (Butler 1979; Huntley and Plew 1981; Plew and Bennick 1990). Importantly, discussions of cultural affiliation have given way to more functional explanations (Butler 1987; Plew and Bennick 1990) a pattern increasingly common in the regional literature (Mack 1990; Reid 1990, see also Griset 1986). Yet, the number of analyzed and/or reported ceramic assemblages remains limited.

The majority of the collection consists of body sherds

ranging in size from 2.5-12.6 cm. Most sherds measure less than 4.0 cm in diameter. Average wall thickness is 1.0 cm, though some very finely constructed sherds measure 0.4 cm in thickness. Interior and exterior surface color ranges from grayish brown (10YR5/3) to reddish brown (5YR4/3) to black (10YR2/1), with reddish brown the most common. Exterior and interior surfaces exhibit a high degree of smoothing. Only two sherds, appearing to be from the same vessel, exhibit rough scraping marks. Most sherds are sand and quartz tempered. The more finely constructed sherds are exclusively sand tempered. Temper size is generally less than 1 mm, though some sherds contain inclusions measuring 2-3 mm in diameter. Mica is common as a tempering agent in only three sherds and probably represents the mineralogy of some local clays. Some coiling is evident.

The collection contains 15 rim sherds, most of which appear to belong to separate vessels. This suggests that the sherds may be from more than a single locality or use as the diversity is not suggested by the dimensions, color and surface treatment of the body sherds. Eleven rims are straight while the remaining four may be described as incurving. Rim thickness ranges from 5-10 mm in diameter. The incurving rim sherds are thin and well made and appear to be from bowl forms as opposed to more typical Shoshonean flower-pot vessels represented by the thick, straight rim sherds. Two of the sherds have been drilled, perhaps to repair cracks (see Butler 1987). The lips of all vessels are flattened. The incurving rim forms are typical of Southern Idaho Plain (Plew 1979), or what Tuohy (1990:90) has recently referred to as Southwestern Idaho Southern Idaho Plain Ware.

Five flat bottomed basal sherds are contained in the collection. The base and wall thickness at the base is 10 mm. Four of the sherds are from a single vessel having steeply flaring walls. The fifth sherd is somewhat more rounded near the base.

One notable observation is the level of organic residue on the interiors of some sherds. This typically measures c. 1mm in thickness and is found almost exclusively on interior surfaces. Though common, such residues are rarely discussed in the local literature. The heavy organic residue suggests parching as opposed to boiling, indicating differential use of some ceramics. As macrobotanical, pollen and phytolith data are recoverable (see e.g. Dean and Heath 1990; Tuohy 1990) from such residues, analysis may provide insights as to the purpose and function of some vessels and serve as a seasonal indicator of use (cf. Butler 1987; Plew and Bennick 1990).

The collection reported here provides further documentation of the diversity in Shoshonean ceramics and its common distribution along the Snake and its tributaries.

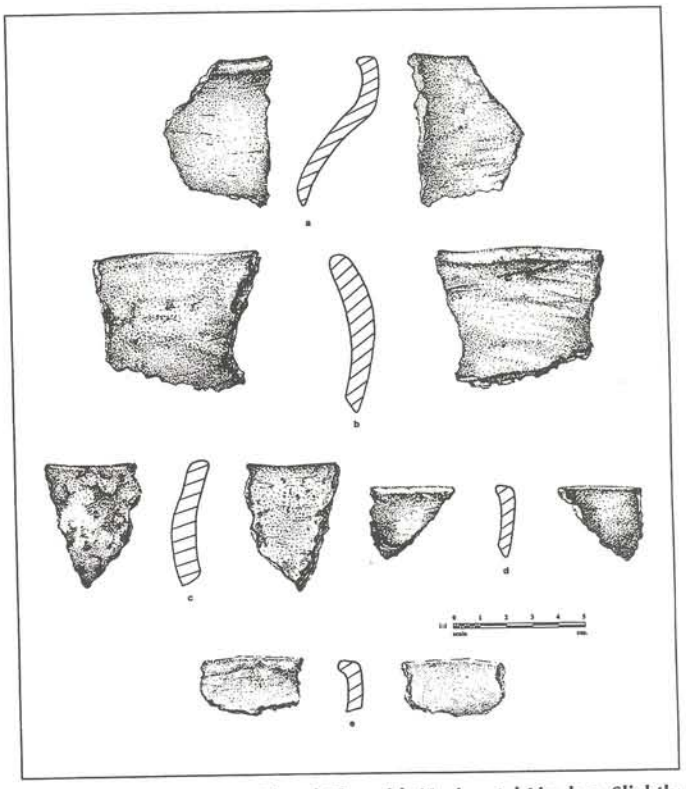

Figure 3. Rim Stance. a, Flared Rim with Horizontal Lip; b-c, Slightly Excurvate Rims; d-e Horizontal Rim Stance.

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BOOK REVIEW

EXPLORING THE FREMONT

By David B. Madsen, University of Utah Occasional Publication, Number 8, 1989.

Reviewed by Pam Demo
Idaho Archaeological Society

The Fremont are believed to have inhabited the western Colorado Plateau and eastern Great Basin from approximately 650 to 1250 AD. Recent evidence suggests possible cultural presence as far north as Idaho's Snake River Plain as recently as 500 years ago. Initially hunters and gatherers, the Fremont gradually adopted simple farming techniques from their southwestern neighbors. Over time, both farming and hunting/gathering were employed as subsistence activities. At no time did domesticates fully replace wild foods, nor was either activity the sole source of subsistence. Madsen discusses variations and similarities among five ecologically diverse living sites scattered throughout the region as examples of the Fremont's ability to adapt to their environment through time and space. Common to each were the concurrent activities of farming and hunting/gathering, adjusted to meet the demands set by environment: weather, geography, availability of water and food resources, and climatic changes.

A Great Basin prehistorian and archaeologist, David Madsen believes that Fremont culture groups as well as individuals were forced to exploit the entire range of subsistence choices — that annually, seasonally and generationally, the Fremont adjusted activities, material/cultural inventories, and the size, location and permanence of living sites to meet the dictates of environment. Evidence indicates hunting/gathering remained a vital complement to the Fremont's simple farming activities. That hunting and gathering was of continued importance may well suggest a new view of the Fremont.

In this regard, the more than 60 years of effort to define the Fremont in terms of archaeological classification schemes have failed. Archaeologists attempted to reduce the area into few or many distinctive regions based on inventory variations. The many trait and inventory lists devised to describe and classify Fremont material have, as a result, prompted some archaeologists to now define the Fremont in terms of identifiable, collective patterns of variation (listed below) that distinctly set them part from their neighbors.

Madsen, among others, has come to view culture as "elastic", wherein the true norms and boundaries of a culture do not necessarily conform to the parameters of inventory lists drawn up by archaeologists — that the presence of variants or traits once interpreted as aberrant, atypical or out-of-keeping with an inventory (and thus not within cultural norm) may now be addressed in terms of variation and its pattern of commonality.

In his monograph, *Exploring the Fremont*, Madsen addresses the need to soften the traditional concept of culture as defined by the tangibles and materials comprising archaeological trait and inventory lists. Steeped in the tradition of using such lists, Madsen now prefers to address the diversity within the Fremont in terms of the group's expression of adaptability in meeting the demands of its natural environment. Indeed, the region which these people inhabited was markedly diverse and varied, and it is the remarkable adaptability of both individuals and groups in exploiting the multitude of resources over this landscape that continues to prevent archaeologists from successfully delivering up the Fremont in a neat and tidy box.

So how does one identify the not-so-easily-classified Fremont culture? Madsen offers an option to the traditional definitions and limits imposed by his science which he thinks heretofore have obscured clear understanding of the Fremont. He examines the diversity of archaeological clues in this geographically and climatically disparate intermountain region that extends from Pocatello, Idaho, south to Utah's Virgin River, and from Ely, Nevada, east to Grand Junction, Colorado, and finds common patterns in the Fremont's many and varied adaptations. He substantiates the underlying commonality in terms of the Fremont archaeological record, evidenced by: living sites (location and regional distribution, permanence, and their dwelling and/or storage structures in terms of construction material and architecture); tool and lithic inventories (frequency, absence or presence and modifications); a unique one-rod-and-bundle basketry construction technique; coiled grayware (a distinctive pottery type found in five regional variations); presence of trapezoidal clay figurines (three-dimensional stylizations of Fremont rock art) and small, incised stone tablets; and a unique leather-hock moccasin style.

Also contributing to the historic difficulty in clearly identifying the Fremont was the early insistence on defining it by how it does and does not correspond to Anasazi cultural traits. While "Anasazi type" lithics, pottery, rock art and architecture are found at Fremont sites on the western Colorado Plateau, they are not readily found in Fremont sites in the eastern Great Basin. Nevertheless, uniquely "Fremont" material is found in all sites throughout this broad region, defining the Fremont in time and space and setting them apart from groups such as the Anasazi and the Numic-speaking peoples that may have later displaced them.

The Fremont peoples disappeared as gradually, mysteriously and seemingly haphazardly as they appeared. There are several arguable theories as to their disappearance. Some believe that adverse climate changes unfavorable to farming may have prompted Fremont withdrawal in conjunction with the Anasazi retreat southward. This argument implies that at the close of the Fremont era there was a return to primarily hunting/gathering activities characteristic of the earliest Fremont peoples.

Another theory cites evidence for out-migration — that new groups of hunter-gatherers moved into the region, forcing the Fremont out. Current evidence indicates that as new groups replaced the old, relatively little integration occurred. Additionally, Madsen believes evidence of grayware along southern Idaho's Snake River Plain may indicate that the Fremont had been pushed to the northernmost territorial boundaries of the Numic-speaking invaders from the southwestern Great Basin.

Exploring the Fremont, sixty-nine pages in length, is clear, concise and thought-provoking; the outstanding illustrations, photographs and maps enhance the text. The book is useful for both professional and non-academic readers, serving as an excellent introduction to more extensive literature available for those wanting to do further reading. It reflects more current approaches among archaeologists in which the Fremont is not evaluated solely in terms of similarities and norms of archaeological traits. Use of flexible inventory parameters more clearly define the Fremont, recognizing diversity and variation as the rule rather than the exception. In meeting the dictates of their environment, the broad range of adaptive responses employed by the Fremont indicate regionwide variations that nevertheless share identifiable commonalities distinctly different from those of both their neighbors and the Numic-speaking groups who replaced them.

BOOK REVIEW

HUNTERS AND GATHERERS: ARCHAEOLOGICAL AND EVOLUTIONARY THEORY

By Robert L. Bettinger. Plenum: New York. X+257 pp., tables, illustrations, references. (no price given).

Reviewed by Mark G. Plew
Boise State University

Throughout the history of European and American anthropology and certainly during the past thirty years, hunter-gatherer research has been, as Bettinger suggests (preface), an acid test of anthropological theory. It is appropriate that Bettinger has taken on the task of reviewing the hunter-gatherer literature. Over a decade ago, he began the publication of a series of papers dealing with the archaeological implications of hunter-gatherer research. Today, most archaeologists have embraced in one way or another various aspects of hunter-gatherer approaches. As Bettinger carefully makes the point in his preface, the reader must realize that *Hunter-Gatherers* is an overview of ideas about hunter-gatherer research, not a review of the literature. Though the latter would have resulted in a much different volume, some may yet find the review unbalanced and selective. This is particularly true of Chapters 1 and 2 which review hunter-gatherers in the context of progressive social evolutionism and Americanist hunter-gatherer research. Though most will agree with the significance of the history of ideas, there is lack of cohesiveness in some sections. To some extent, this no doubt represents the insights of reviewers whose own agendas relative to historical particulars favor an emphasis upon the propriety of one idea or scholar over another. Some areas of discussion, such as theories of environment and political economy seem underdeveloped, while others appear as addenda or after thoughts. Chapter 2, which is concerned with the history of Americanist hunter-gatherer research, could be strengthened by a greater integration of many of the ideas discussed in Chapter 1. There is also a noticeable lack of discussion of the importance of the work of Steward and White to developments in hunter-gatherer research. Though developed in other portions of the book, it would be appropriate and useful to the overview of Americanist research. Nonetheless, the author is to be commended for an overview which specifically ties developments in hunter-gatherer research to the ideas and concepts so commonly discussed in the history of anthropology.

The remainder of the text is dedicated to what Bettinger refers to as limited set theories and general set theories. The former represents research conducted by theories of limited sets or theories concerned with limited sets of behaviors. The latter, general set theories or general theories as they are normally understood, represent explanations of broadly discordant phenomena.

Limited theories are considered in Chapter 3 under discussion of middle range theory and in Chapters 4 and 5 under optimal foraging theory. Following a brief discussion of the tradition of middle range research, Bettinger exemplifies the approach by discussion of Binford's forager-collector continuum and the nature of site formation processes. Of greater interest and perhaps curiosity is his discussion of the fallacy or "myth" (p.77) of middle range theory. Bettinger's treatment of Binford seems unduly harsh as his work has been pivotal to many innovations championed by the author. No doubt all who have attempted to operationalize the relationships between a static archaeological record and the dynamic processes of human culture will be sympathetic to the criticism levied against Binford for his emphasis upon technoeconomic variability. Indeed, many contemporary studies in paleoanthropology would suggest widespread acceptance of the position. Though few doubt the correlation between assemblage diversity and assemblage size as an important consideration in activity area studies, many will agree with Dunnell's (1989) view that diversity studies presently lack any useful application. In general Bettinger attributes much to Binford that those familiar with his work will find somewhat puzzling.

In contrast, Chapters 4 and 5 provide an extremely useful overview of optimal foraging theories. Chapter 4 summarizes simple optimality models. Bettinger's discussion of diet breadth, patch choice and central place models is effectively demonstrated by abbreviated examples of the Ache, Alyawara, Cree and !Kung.

A significant portion of Chapter 4 is given to a discussion of the criticism of optimal foraging theory. While the limitations of optimal foraging are clear and acknowledged by many, Binford is again singled out as the focus of criticism. Perhaps more here than elsewhere in the text Bettinger appears preoccupied with his perception that Binford and other middle range researchers discount the value of optimal foraging theory. Though brief, Chapter 5 provides discussion of resource variability, risk and food sharing. Linear programming and Z-score modeling are the focus of his discussion.

Marxist and Structural Marxist perspectives are the focus of Chapter 6. Bettinger appropriately acknowledges the ignorance of most archaeologists to Marx and cultural materialism, proceeding through an adequate discussion of elements of the Marxist program relative to hunter-gatherers. His brief discussion of applications in ethnography and archaeology nicely exemplify the problems of Marxist approaches. The chapter should be of particular utility to students who often have scant knowledge of Marxist paradigms. Most interesting is Bettinger's discussion of the influence of Marxist theory on the develop-

ment of "post-processual" archaeology (pp. 146-149). His elaboration of similarities and articulate indictment of Hodder and Tilley and Shanks is very much to the point.

Chapters 7 and 8 provide an important overview of Neo-Darwinian theory and cultural transmission. The discussion of evolutionary human ecology in Chapter 7 is a particularly useful overview. The chapter provides reasonable discussion of the significance of group size, inclusive fitness, Winterhalder's analysis of opportunity costs and Ache food sharing. Though notably one of the more difficult chapters to bring together, Chapter 8 is lengthy, a bit rambling and at times seemingly disconnected. Many will find the chapter heavy on Boyd and Richerson (1985) in which cultural preference enhances or subverts genetic fitness (p. 208) and as a result to their distaste. Yet, for those unfamiliar with their work, Bettinger's (pp. 186-190) discussion of guided variation and direct, frequency-dependent and indirect bias will be of utility.

The final chapter, *Problems in Theory,* is devoted to summary of the text and problems facing hunter-gatherer research and theory building. A central and important point is the need to better understand the process of theory formation and application. In this context, Bettinger reiterates the importance of Darwinian models, chides evolutionary ecologists (*adaptationists*) for their failing to import greater significance to cultural transmission and champions Boyd and Richerson's (1985) approach as the basis by which we can discover the laws of human behavior.

In general, this is a very important book and one which will be read by a relatively diverse audience. Bettinger is to be commended for admirably tackling an enormous task. He has brought together many divergent histories and perspectives in providing a much needed overview.

Boise State University
College of Social Sciences and Public Affairs
1910 University Drive
Boise, Idaho 83725

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