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PAPERS ON ANTHROPOLOGY OF THE GREAT BASIN

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PAPERS ON ANTHROPOLOGY OF THE WESTERN GREAT BASIN

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I. BIG GAME HUNTERS IN THE GREAT BASIN: A CRITICAL REVIEW OF THE EVIDENCE

R. F. Heizer and M. A. Baumhoff

D. R. Tuohy (1968) in a useful review of recently discovered possible Paleo-Indian sites and artifacts from Western Nevada has touched on one of the more puzzling aspects of Great Basin Early Man evidence, namely, that fluted points made in the Clovis tradition, as well as other distinctive early point forms, are now known in numbers, but these have thus far not been found in clear association with the skeletons of extinct animals.

Here we wish to comment on Tuohy's remark: "On this point, statements denying the existence of early man as a hunter of now extinct animals in the Great Basin (Jennings 1964:151; Heizer 1964:120-121) have served to inhibit the study of Great Basin culture history and to impair the development of Great Basin culture theory. The truth has a way of coming out, however, and Cressman (1966:866), among others, is one archaeologist who has spoken out against categorical denials of evidence of man in association with extinct fauna in the Great Basin (Heizer and Baumhoff 1965)".

What Tuohy chooses to interpret as our "statements denying the existence of early man as a hunter [of extinct fauna]" in the Great Basin are really not denials, but are conclusions reached by us at the time of writing based upon lack of good evidence of human-extinct animal association. Baumhoff and Heizer (1965:699) concluded that "...if uncertain associations of man and extinct Pleistocene mammals are ignored, evidence is still lacking that man knew or hunted or ate such animals in the western desert region other than in Southern Arizona. The simplest conclusion is that the large herbivores disappeared in the Great Basin before man's entry into the area." This opinion seems today still supportable. Such opinion does not as Tuohy says, "deny the existence of early man as a hunter in the Great Basin"; it merely holds that there is no clear evidence of the hunting of the large Pleistocene herbivores. And further, it does not deny that tomorrow a discovery of stone tools in clear association with an elephant or camel or sloth may be made.

When Tuohy says (Ibid:31) "I believe that the western Great Basin witnessed Paleo-Indian, free roaming, big-game hunting", he is making a statement of faith and not of fact. And for this reason it is scarcely fair of him to adumbrate this personal belief to the extent that persons who do not agree with his belief have suppressed "the truth [which] has a way of coming out."

Let us look at the hard evidence for Big Game hunters freely roaming the Great Basin. There are numerous finds of extinct Pleistocene animals reported from Nevada (cf. Hay 1927:2, 23, 25, 46, 57, 81, 112, 116, 137-154)

but thus far none of these finds have been associated with artifacts. So far as we know post-1927 paleontological discoveries in open stations are in the same category.[1] Gypsum Cave was for long held up as proving that man lived at the same time in the cave and presumably hunted the ground sloth, Nothrotherium. Now, on the basis of two radiocarbon age determinations for artifacts believed by the original excavator and collector to be contemporaneous with the sloth, it seems clear that the sloth and man occupied the cave at different times - the sloth about 8,000 to 11,000 years B.P. and man only as long ago as about 2,400 to 2,900 years B.P. The newer C14 evidence for this conclusion is reviewed by Heizer and Berger (this volume). It may be argued on technical grounds that Gypsum Cave lies outside the Great Basin (for map of the Great Basin and archaeological sites see Bennyhoff 1958: Map 1), and this is true, but the Gypsum Cave site is mentioned here to illustrate the not uncommon situation of a claimed association of extinct animals and man which was at first accepted but which has later proved to be incorrect. Similarly with the Tule Springs site in the same area. Here was a locality which was very forcefully argued and accepted by many as proving man's presence from 24,000 to 28,000 years ago and his contemporaneity there with camel, bison, horse and mammoth (cf. Simpson 1956: Harrington and Simpson 1961), but careful study of the locality shows that these claims were erroneous, that human presence at Tule Springs dates from 10,000 to 11,000 years ago (Shutler 1968a), and further, that none of the extinct animal remains are associated with tools or man-induced charcoal from fires (Harrington 1954; cf. Cook 1964). If nothing else, Gypsum Cave and Tule Springs should serve as cautionary reminders against too-ready and uncritical acceptance of claims of man-extinct animal associations. But, we might add, the Tule Springs investigation does show that man was in the Gypsum Cave area at the same time as the great herbivorous ground sloth. If he hunted and killed and ate the ground sloth we do not know; as of this moment the data from Gypsum Cave and Tule Springs will allow the conclusion only that early man in southern Nevada was a non-big game hunter.

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[1] We know practically nothing about the chronology or causes of Pleistocene large-animal extinctions in the Great Basin. Martin and Wright (1967) have edited an important volume of papers on the general subject of Pleistocene extinctions. Krantz (1970) has recently published a useful discussion of the subject. But, with reference to when and why the megafauna of the Great Basin died off, and whether man had a hand in this process, we must at least know for certain whether man was present in the Great Basin at the time when the animals were also living there. How can we talk about kill, much less overkill, unless we can be certain that there were large animals available to man as quarry, and whether man utilized these for food?

Wheeler (1942:42-45) found in 1935 in Etna Cave, about 110 miles north of Las Vegas, Nevada, pieces of animal dung which were identified as horse. Since Wheeler believed the dung to have occurred in pre-contact layers, he concluded that the animal was a Pleistocene horse. Nothing in the way of artifacts from Etna Cave suggests that the culture is very old, and for this reason the presence of Pleistocene horse seems doubtful. Radiocarbon dating of the dung would settle the problem of the horse dung age. Occurrence of a Gypsum Cave type point (Wheeler 1942: Fig. 39a) in the same layer as the horse dung suggests a dating of ca. 3000 years rather than a Gypsum Cave age (as dated before recent correction) proposed by Roberts (1944) and accepted by Jelinek (1957:233, Fig. 2). In view of the obscurities surrounding Etna Cave it is perhaps best to leave it and its horse dung in the doubtful category.

Statements have been made that caves and rockshelters in the Lake Winnemucca basin, just north of Pyramid Lake, have yielded artifacts associated with the shrub ox, Euceratherium (Shutler 1961:518; Shutler 1968b), horse and camel (Orr 1956). We must wait for the report on the shrub ox occurrence, and merely observe that a lower mandible and portion of the upper jaw could be explained as loose, portable items brought into a shelter by a carnivore or a packrat. At least they seem relatively useless parts of a game animal killed outside the cave and brought there to be eaten by Big Game hunters. Shutler (1968b:25) assigns the Nevada shrub ox a date of about 5000 B.C., but if this is based upon the "assumed" date of 7432 B.P. for the presence of the same animal in Burnet Cave, New Mexico (Shutler 1961a:518) is not made clear by him. At any rate, we must know more about the find before accepting it as evidence for "free roaming, big-game hunting".

Orr's claim of man's association with horse and camel at Fishbone Cave in the Winnemucca Lake basin surely leaves something to be desired in the way of supporting evidence. We read (Orr 1956) that Levels 3 and 4 in the cave contained "many fragments of camel and horse bones...the majority [of which] are split for the marrow." The human occupants of Level 3 dug numerous cache pits into Level 4 (Ibid:6) and there is admitted "the possibility that some artifacts [and bones?] appearing in Level 3 may actually have originated from the time Level 4 was laid down (cf. Sears and Roosma 1961:669-670). A fragment of a horse mandible and an awl said to be made from the left fourth metapod of a Pleistocene horse from Level 3 are taken as evidence that man knew these animals. While this may be the case, Orr's report of 1956 is so poorly done that one really cannot judge the quality of the excavation or the paleontological and archaeological data presented. Sears and Roosma's report of 1961 on the climatic record in the cave deposits seems impressive, but it also leaves some basic questions unsettled. Thus, Level 3 in Fishbone Cave (referred to as F3) "is placed circa 5000 B.P. to correspond with the humid episode that followed 6000 and is confirmed by samples 9, 8, and 7 GN [GN refers to nearby Guano Cave] lying about the [C14] dated sample 10 GN [6250 B.P.]. Although a good argument could be made for placing F3 much later (cf. 16 GN), the breakdown of its spectrum in Figure 3 as compared

with that of 9 GN leads us to place it as we have done. Also the presence of horse and camel bones, even though these may have been dug up by man from a short distance below, seems significant." (Sears and Roosma 1961:676). The italics in the passage quoted are ours and we have done this in order to emphasize that what "seems significant" to us as archaeologists is whether the horse and camel bones were originally present only in Level 4 and may have been disturbed by the Level 3 occupants so that artifacts were introduced downward in Level 4 at the same time Level 4 horse and camel bones were being introduced upward into Level 3. The fact of abundant intrusion of Level 4 in Level 3 times is made quite clear by Orr. We invite any reader of our expression of doubt to read with care Orr's account (Ibid:pp. 6-9) of his excavation and findings in Levels 3 and 4 in Fishbone Cave and feel reasonably confident that he will conclude that the case of Pleistocene animals associated with man at that site does not rest on clearcut evidence. The C14 dates from Fishbone Cave have been discussed by Grosscup (1958:20) and Sears and Roosma (1961). A date on a juniper bark artifact from the lower part of the lowest occupation layer is 9245 $\pm$ 250 B.C. (L-245), the upper portion of the same layer is 5874 $\pm$ 350 B.C. (L-289KK) which gives this layer a floruit of about 3400 years. If Level 4 was laid down before occupation of the cave by man, Level 3 could be very much more recent than Level 4. We are reminded of the Gypsum Cave situation where the site apparently remained without disturbance after its abandonment by the ground sloth for perhaps 5000 years until it was occupied by man. Because of "the obviously inadequate description of Fishbone Cave artifacts and the idealized stratigraphy presented", Grosscup (1958:20) believes that "any decision as to the significance of the radiocarbon dates from the sites should be withheld." We are in agreement with this conclusion since we believe the question at hand is too important to be lightly decided on the basis of such confusing information.

In the southwestern sector of the Great Basin, specifically the desert region of Southern California, there are many sites which have been claimed to refer to Early Man. Even though one of us has expressed doubts as to the nature of the evidence of some of these claims (Heizer 1965: see also Carter 1967; Warren 1967, 1970) it does seem probable that some of the lake terrace-associated implements (e.g. from Lake Mohave) are indeed ancient. But here we have up to now no evidence of extinct fauna, even though some of the cultural material may date from as old as 9 to 10,000 year ago.

For the open sites and caves in the lower Humboldt Valley (Lovelock Cave, Leonard Rockshelter) there is so far no hint of man's knowing the extinct fauna, since we have no finds of bones of extinct fauna in the lower levels of occupation sites. The same is true for the Salt Lake region caves (Danger Cave, Deadman Cave, Promontory Point Cave, Hogup Mountain Cave). Jennings (1964:152; 1966:83) notes the lack of evidence in the Great Basin proper of extinct animals hunted by man, and ascribes this to aridity, noting that the Great Basin "has had the same environment as obtains today for over 10,000 years." This view is held by others (Jennings and Norbeck 1955:2; Malde 1964, 126; Baumhoff and Heizer 1965:699).

Cressman (1966) has objected to the conclusion reached by Baumhoff and Heizer (cited supra) that there are no certain occurrences of extinct animals and man in the Great Basin, and points to Paisley Five-Mile Point Cave No. 3 as a spot where artifacts were found associated with cooking fire ash and bones of horse, camel, bison, mountain sheep, a large dog (wolf), fox, bear (?) water birds (pintail, teal, duck), hawk and sagehen (Cressman 1942: 93-94); Cressman 1940a:174-175; 1940b; 1951:300). Cressman concludes that "The mixture of bones and ash in this small space tells a story of these hunters bringing a part of their kill to this shelter, where it was cooked and the refuse thrown back over the rock or against the wall to pile up midden-like (Cressman 1942:93). These conclusions seem clear, but when one tries to find out details such as the size of the cave, whether any of the bones were burned in what are said to be the hunters' cooking fires, how many bones of the seven mammalian and five avian forms were recovered (Cressman 1942: Fig. 95 illustrates eight of the mammal bones, Cressman 1940:174 says he removed "a large number of partly fossilized bones of a number of large animals"),what the relative count of extinct faunal remains was from layers 6 and 7 (Cressman 1942: Fig. 53), and so on, we cannot do this because these important details are not provided. This last statement, we are aware, sounds critical, but we must remind the reader that Cressman (1966) has recently stated that the Paisley Five-Mile Point Cave No. 3 association of artifacts and extinct animals is a certain and indubitable case. Regardless of these obscurities in the information, we are inclined to accept Paisley Five-Mile Point Cave No. 3 as the strongest candidate for contemporaneity of man and extinct animals in the Great Basin. We emphasize our tentative acceptance of this occurrence, however, because we are unable to assess the full evidence. In brief, what seemed quite clear to Cressman when he wrote in 1940, 1942, 1951, and 1966 did not seem as certain to us when we published our evaluation in 1965 and at the time of writing the present review. We do not presume to try to interpret the Paisley Five-Mile Point No. 3 Cave situation, but suggest that it may be similar to the one which we have proposed for Fishbone Cave. The mammalian bones could have been introduced to the shelter by carnivores at a time before man appeared in the area.[2] The bird bones may also be explained in the same way. At Leonard Rockshelter in 1950 we recovered from the surface levels where waterfowl bones were very abundant, several dozen aluminum birdbands dating from 1908-1915 which we believe were brought there by coyotes or foxes who had carried to their den the bodies of sick or dead migratory waterfowl they had secured on Humboldt Lake several miles to the west. Here is a clear case of the introduction of faunal remains into an archaeological site which was not at the time being occupied by man. The Leonard Rockshelter example illustrates the possibility that under certain circumstances one could have such faunal introductions made where man arrived later and introduced some evidence of his presence. To those whose reaction to such propositions is that this is

[2](Cressman 1951:309 suggests an age of 11,500 B.P. for the lowest layer containing artifacts and extinct animals).

grasping at special explanations in order to avoid facing what Tuohy calls "the truth", we answer first, that we believe that such things are possible (Harrington's faulty interpretation of Gypsum Cave is one example), and second, that alternative explanations should always be formulated, weighed, and if possible decided. If we are unable here to arrive at final decisions that is in part due to the inadequacies of the information provided in the published record. We want to make it clear that we are not questioning the conclusion that both the stone artifacts and animal bones in Paisley Cave No. 3 are old. What we are not certain about is whether the artifacts are of equal age as that of the bones they are associated with.

An interesting project for some enterprising archaeologist would be to excavate several Great Basin rockshelters which were never occupied by man, and to record in detail the stratigraphy and material content of each layer. If faunal remains were present we would have available an example of one or more osseous "assemblages" whose presence was due to non-human agencies. When these assemblages were then compared with those from occupation-refuse layers in archaeological cave or shelter sites we might secure some direct hints as to which animal bones were introduced by man and which were brought there by animals at times when man was not occuping the cave. Caves or shelters which have been fully excavated in earlier times (for example, Humboldt Cave which was emptied 35 years ago) might have begun to acquire such materials. It is well known that wood rats (Neotoma)will collect bones as nest material (Brooks 1956:112; Heizer and Brooks 1965:160), and we have already noted the recent introduction of bones of waterfowl, probably by foxes or coyotes, at Leonard Rockshelter. Lovelock Cave contains abundant evidence of the presence of coyotes, and since it is inconceivable that these animals were visiting the cavern at the same time man was living there, we may safely attribute some of the animal bones in the Lovelock Cave refuse deposits to the agency of coyotes. Loud (1929:33) thought that nearly all of the unworked animal bone in Lovelock Cave was brought there by animals and not by man. Thomas (1969:397-398, 400) has recognized the problem of whether all of the animal bones recovered from three Great Basin caves or shelters are food remnants introduced by man, or are in part due to natural, or at least non-human, causes. While one may be inclined to assume that bones of small rodents may not be food remains, it is at the same time not impossible that quite large bones of big mammals such as mountain sheep, antelope and deer could be introduced by coyotes into caves, possibly in quite large numbers. We simply need to know much more about how cave fills are accumulated than we do at present before we can talk with any assurance about hunting patterns, butchering patterns, the percent of meat in the prehistoric diet, etc. etc. Another useful exercise which occurs to us is suggested for some library archaeologist. This would take the form of collecting from the published archaeological literature on Great Basin sites, a body of data on bones which have been identified and which are assumed to be food remains. Such a corpus of information might provide a useful comparison for aggregates of bones such as found in the bottom of Paisley Five-Mile Point Cave No. 3 or in the lower layers of Fishbone Cave.

This brief survey has been written not only as a review of evidence, but also of the nature of evidence which often seems to us to not support conclusions derived from that evidence. The questions we raise here are those which occurred to us in writing our paper in 1965, and we reject Tuohy's interpretation of our conclusion as "categorical denials of evidence for man in association with extinct fauna in the Great Basin."

Tuohy (1968) seems to be trying to apply a model[3] of the past which he assumes obtained for Paleo-Indians outside of the Great Basin. Meighan (1959) has discussed alternatives to this model. The model which may come closer to the actual way of life generally followed in the western Great Basin ± 10,000 years ago, however, is that proposed by Davis (1966), Napton (1969), and Clewlow (1968) which is that the earliest occupants of this region were lake margin dwellers who were doing considerable waterfowl hunting, and probably (though there is no hard evidence) also eating fish, seeds and starchy roots of marsh vegetation. Chipped crescent-form transverse points and concave base projectile points clearly connected with the Clovis tradition are part of the culture inventory of these people.

Thus far no buried campsite of these early lakeside hunter-collectors has been found and excavated, but such sites surely exist, and when one is examined we will for the first time be in a position to compute its age, note the kinds of industrial and economic activities the group was engaged in, and determine what the imperishable material culture inventory comprised. The economic base may have been quite varied. It may have included some of the extinct megafauna as well as larger surviving mammals such as antelope, mountain sheep, and deer. At the moment, however, nothing stands against the possibility that the fluted points thus far found in the western Great Basin were used to kill anything but "microfauna". It is possible that the "free-roaming, big-game hunting" pattern was followed in the Great Basin, but the close association of transverse points and early projectile point forms such as noted by Clewlow (1968), Tuohy (1968) and Shutler and Shutler (1959) with lake basins seems to hint at a lacustrine rather than a big game hunting economy in the western Great Basin about ten millennia ago. Warren (1967: 183-184) suggests that between 9,000 and 12,000 years ago Great Basin economy was based on a "hunting, fishing pattern in which big mammals were of considerable importance, and supplemented by small game, fish and fowl." Referring once more to "models", we believe that there is little to be gained from anyone's taking the position that we will remain in limbo on the problem of what Early Man was doing in the Great Basin until someone uncovers a Pleistocene elephant which was killed with darts, tipped with Clovis, Milnesand or Lind Coulee points. We believe that there is now pretty good evidence of where he was and what he was doing. Why do we not simply look at the good evidence we have and not worry too much if this is not what we have been taught to expect to find?

[3] If we read Tuohy correctly, he refers to this as "archaeological theory" - a term which we doubt he could defend in a debate.

But above all else, let us have more publication of the results of archaeological research, and when this concerns such important and little-known (or little agreed upon) matters such as the association of artifacts and bones of extinct animals, let us be informed of all of the stratigraphic, chronologic, typologic and paleontologic data that can be secured. Let us, in presenting data, try to anticipate the questions which critical readers may ask, not in the hope of evading criticism as authors, but in the desire to answer as adequately as possible the questions which are bound to be asked if the conclusions drawn are not fully supported by the evidence.

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II. RADIOCARBON AGE OF THE GYPSUM CAVE CULTURE

Robert F. Heizer and Rainer Berger

In February, 1950, one of us (RFH) while serving as a member of the subcommittee on radiocarbon, wrote to Dr. M. R. Harrington, Curator of the Southwest Museum, suggesting that the latter might wish to submit to W. F. Libby's radiocarbon laboratory at the University of Chicago some organic samples (charcoal or wooden artifacts) from Gypsum Cave, Nevada in order to secure a cultural date to check the paleontological date of the dung of the ground sloth (Nothrotherium Shastense) which had recently been determined to be 10,455 $\pm$ 340 years B.P. (C-221, from a depth of 6'4" and C-222, 8427 $\pm$ 250 years B.P. from a depth of 2'6"). While Dr. Harrington sounded interested, this was never done.

Just sixteen years later, in February 1966, one of us (RFH) wrote to Mr. Bruce Bryan of the Southwest Museum suggesting that it would be desirable to check the radiocarbon age of the sloth dung with samples of organic material whose presence in the cave was undoubtedly ascribable to humany agency. Since 1950 an additional sample of the Gypsum Cave sloth dung had been dated: LJ-452 gave an age of 11,690 $\pm$ 250 B.P. No reasonable doubt could exist, therefore, that the ground sloth was living in the cave between eight and eleven millenia ago. But, since it was a little difficult to imagine man and the sloth occupying the cave at the same time the question could be asked whether the use of the cave was an alternating one where men and sloths took turns, or whether man had in fact utilized the cave after the disappearance of the sloth. In the latter case, the further question would be, how much later?

Mr. Bryan consulted with Dr. Carl Dentzel, Director of the Southwest Museum, and with Dr. Harrington, the original collector. Everyone agreed that it would be desirable to submit samples of artifacts which appeared to be contemporaneous with the sloth dung. We selected for testing some of the burned sticks whose occurrence is shown by Harrington (1933:Fig. 43). The published account of their occurrence seemed to indicate these as belonging clearly to the sloth period, and therefore of the Gypsum culture. Harrington (1933:73-74) described the occurrence as follows:

"After the trenching in the passage [between Rooms 4 and 5] was completed, the remaining area was very carefully worked over, resulting in a number of additional finds. At the northeast end of a large fallen block of crystal was made one of the most important, suggesting association of man and the sloth. The evidence consisted of twelve small sticks, each burned at one end, and one unburned stick lying in the bottom of a hole or pocket, 10 1/2 inches deep, excavated in the lower dung layer and filled with loose sloth dung. This hole was capped over with an unbroken stratum of solid, well-preserved sloth dung 17 1/2 inches deep, giving a total depth from the

surface to the sticks of 28 inches, not including some large pieces of fallen crystals lying on the top of the upper dung layer. The situation is shown in the section (fig. 43), and in a photograph showing two of the sticks in place as shown in fig.44.

The hole may have been a small pit dug by ancient people in the days of the sloth, or it may have been a sloth-period rat's nest--the latter suggested by the fact that a few rat droppings were found among the loose dung that filled the hole, although none of the sticks showed chewing by rats.

Whether the hole was made by rat or man, it seemed to belong to the period before the last sloth layer was laid down, for the heavy dung layer was unbroken above, and no holes or passages running under it could be found. The top of the lower dung layer had evidently been the floor of the cave when the hole was dug.

The exact diameter of the pit is not know, because Mr. Thurston who made the find, dug into it from the northwest and broke through the edge of the pit before encountering the burnt sticks; but he indicated a point about 21 inches from the southeast edge as the approximate position of the opposite edge of the pit. It would be exceedingly difficult to explain the presence of the sticks on any other ground than that they had been deposited by man after the lower layer of sloth dung had been laid down, but before the upper one had come into being."

Six of the twelve small Sarcobatus sticks from this feature were received in Berkeley. They weighed in aggregate 26.2 gr. They were photographed and three weighing a total of 16.65 gr., were sent to UCLA where one of us (RB) processed the decontaminated specimens and determined that their age was 2400 $\pm$ 60 years B.P. (UCLA-1069). The marked disparity between this age and that of the sloth dung made it desirable to make at least one more age determination, preferably of an undoubted artifact.

Mr. Bryan then made available for this purpose the distal end of a decorated atlatl shaft (No. 6F592) which Dr. Harrington (1933:24, 109, fig. 15; specimen shown in Frontispiece, fig. i) recovered at a depth of 8.5 feet below the surface in Room 2 (Ibid, fig. 15). He classifies this as a Type I dart shaft and is unequivocal about his belief that it is "contemporary with the sloth." (Ibid, p.114). The specimen weighed 10.0 gr. and was identified by Professor R. Cockrell, Dept. of Forestry, University of California, Berkeley, as Sambucus (elder). The atlatl dart fragment was determined to have an age of 2900 $\pm$ 80 years B.P., (UCLA-1223). These dates were first published in Southwest Museum Masterkey, Vol. 41, p.66, 1967 and subsequently in Radiocarbon, Vol. 9, pp. 479-480, 1967.

It thus appears that the ground sloth lived in Gypsum Cave long before it was occupied by man, and that since 2400 to 2900 years ago a

considerable amount of disturbance of the loose, surficial cave deposits has occurred. In this apparent process of disturbance and redeposition a number of artifacts, among them the fireplace sticks and the atlatl dart, found a resting place where they were covered by sloth dung which was taken by the excavator to be lying in its original position. Clearly we are faced with a classic case where an apparently obvious archaeological association was not true yet seemed quite bona fide. This instance amplifies the need for the direct dating of materials whenever it is possible.

Essentially the age determinations of UCLA-1069 and UCLA-1223 show two things. First, the oldest reported evidence of human occupation of Gypsum Cave was much more recent than the utilization of the cave by the ground sloth. Second, there has apparently been a considerable amount of disturbance of the cave deposits and this translocation of portions of the cave fill was such that the original excavator was unaware of the fact.

There are other hints that the Gypsum Cave culture is relatively recent. The distinctive form of chipped projectile point called the Gypsum type was abundant in the cave. At the Corn Creek Spring site, examined in 1962 as part of the Tule Springs Expedition, no Gypsum Cave type points were recovered (Williams and Orlins 1963). Since the Corn Creek Spring site is only about 20 miles north of Gypsum Cave one might expect the Gypsum type point to be present if both sites were occupied at the same time. Radiocarbon dates for the Corn Creek Spring site range from 4070-5200 years B.P. The Gypsum Cave type point is, therefore, either too early or too young to have occurred at Corn Creek Spring. We would be inclined to guess that the Gypsum point is younger than the Corn Creek Spring occupation, and this is supported by the suggestions of Lanning (1963:295) and Rogers (1939:47). Williams and Orlins (op.cit:35) believe, on the other hand, that Gypsum Cave culture is older than that present at Corn Creek Dunes.

The Nothrotherium-human artifact association proposed by Harrington in 1933 has been accepted by many, viewed with doubt by others. Heizer (1951:23-24) and Sellards (1952:78) earlier pointed out that we could be certain of this association only if wooden artifacts said to occur with sloth remains were dated and both kinds of material shown to be of equal age. Antevs (1952:26) found it difficult to accept the great age of the Gypsum Cave sloth dung, but fuller information on altitudinal shifts of vegetation zones secured recently help to resolve this problem (Wells and Jorgensen 1964). C. B. Hunt (1956:38) saw a problem in accepting the sloth in Gypsum Cave when this was compared with the C14 age of sheep dung in Danger Cave, Utah. Hunt said, "If we were to believe these dates, the Recent in northern Utah is older than the Pleistocene in Southern Nevada." H. Aschmann (1958:34-35) suggested that the sloth dung dates were too recent, probably because of sample contamination and would prefer to have it be "some thousands of years older". E. Lanning (1963:293, 295) was of the

opinion that "Every other datable occurrence [than that in Gypsum Cave itself] in our area [of Gypsum Cave type projectile points] suggests a much more recent time, probably this side of 2000 B.C." Lanning cites several instances of association of Gypsum type points with what are clearly later forms and concludes that "they are clearly associated with Elko points in a late Pinto and post-Pinto context throughout the southern part of the western Great Basin... yet they seem associated with Pleistocene sloths in southeastern Nevada. It is possible that the seeming association at Gypsum Cave is fortuitous. The sloth remains may have got on top of the projectile points and other artifacts as a result of people's digging holes for one purpose or another during post-sloth times in the cave."

It is still possible that there is evidence of man in Gypsum Cave older than 2900 years B.P., but only additional excavation could test this proposition. What would be desirable would be a second investigation of the cave and a restudy of the materials collected by Dr. Harrington in 1929-1931 and now maintained at the Southwest Museum.

A recent article in Desert Magazine (Lawlor 1970) unfortunately repeats the earlier interpretation of man living in Gypsum Cave with the ground sloth about 10,000 years ago. This is worth mentioning only to remind readers of scientific articles that the news travels slowly to the public.

Radiocarbon dates from Gypsum Cave

Material	Sample No.	Age	Reported in
Sloth dung	C-221	(10,902 ± 440 BP)	Libby 1955:117
		(10,075 ± 55 BP)	
		Av. 10,455 ± 340 BP	
Sloth dung	C-222	(8,692 ± 500 BP)	Libby 1955:118
		(8,051 ± 450 BP)	
		(8,838 ± 430 BP)	
		Av. 8,527 ± 250 BP	
Sloth dung	LJ-452	11,690 ± 250 BP	Hubbs, Bien and Suess 1963:259
Greasewood sticks from fireplace	UCLA-1069	2,400 ± 60 BP	Berger and Libby 1967: 479-480
Atlatl dart shaft	UCLA-1223	2,900 ± 80 BP	Berger and Libby 1967: 479-480

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III. AN ASSESSMENT OF RADIOCARBON DATES FOR THE ROSE SPRING SITE (CA-INY-372), INYO COUNTY, CALIFORNIA

C. W. Clewlow, R. F. Heizer and R. Berger

In 1963, Edward Lanning published his report on the archaeology of the Rose Spring site (CA-Iny-372) Inyo County, California (Lanning, 1963). The site is of considerable importance because it is an unusually deep, stratified deposit producing large numbers of artifacts, particularly projectile points. Many of these projectile points are types which are widely distributed throughout the Great Basin. In 1963 at no other Great Basin site could such a large number of points be sequenced stratigraphically. Lanning's report contained no radiocarbon dates which would firmly anchor in time the important projectile point sequence from the Rose Spring site (cf. Byers, 1964, p. 121). Nonetheless, Lanning had established a sequence of five periods or phases, had assigned guess-dates to the phases, and had designated a number of named projectile point types as general time markers for the phases in which they occurred. The dates were estimates based on thoroughgoing comparisons with other sites in California and the Great Basin. The point types at Rose Spring included several which had been recovered from two stratified sites in 1958 and 1959: Wagon Jack Shelter (NV-Ch-119) at Eastgate, Nevada, and South Fork Shelter (NV-El-11) near Elko, Nevada (Heizer and Baumhoff, 1961). Table I summarizes Lanning's phase chronology and lists the point types.

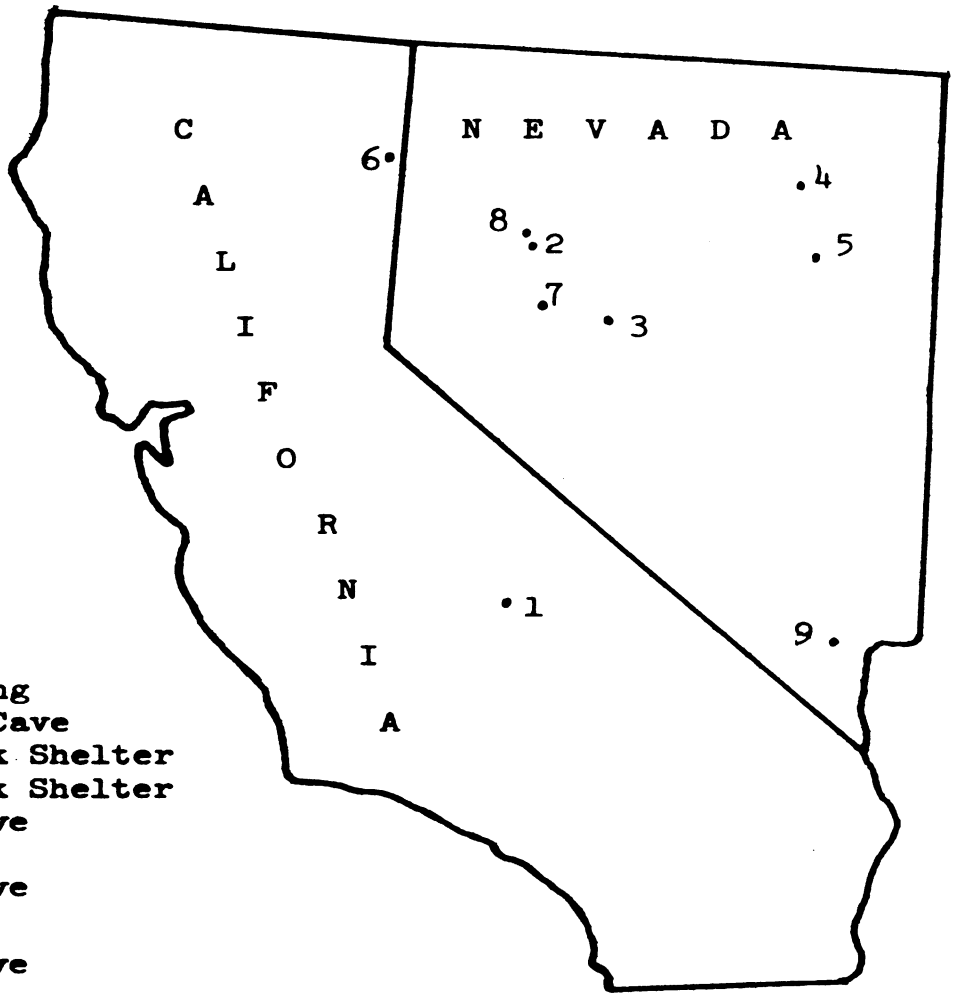
Since the publication of the Rose Spring report in 1963, considerable effort has been directed toward a refinement of Great Basin projectile point sequences. While no site excavated since 1963 has duplicated the long stratified sequence of Rose Spring, a number of other sites for which we now have radiocarbon dates provide the opportunity to secure chronometric dates for particular segments of this sequence. Studies of these sites, or of particular aspects of them, have tended to generally corroborate Lanning's dates as well as affirm the reality of the named point types which he cites.

O'Connell (1967) in a detailed study of the Elko series points, asserts that they date between 1500 B.C. and 600 A.D., a period which is consistent with Lanning's estimate for the floruit of these forms at the Rose Spring site. Clewlow (1967) is also in accord with the general Lanning sequence, and cites a radiocarbon date of 1210 $\pm$ 60 B.P. (UCLA-1071F, discussed in more detail in Tubbs and Berger, 1967) for organic materials associated with the Rose Spring Corner-notched point type at site NV-Ch-18 (Lovelock Cave). From South Fork

Shelter (site NV-El-11) in Elko County, Nevada, there are three radiocarbon dates ranging from 2410 B.C. to 1370 B.C. (LJ-212, UCLA-295, UCLA-296) for the lower part of the deposit in which one Pinto, one Humboldt concave Base A, and one Humboldt Basal Notch point were recovered (Heizer, Baumhoff and Clewlow, 1968). The remainder of the Medithermal point types (i.e. Elko Eared, Elko Corner-notched, Eastgate Expanding Stem, Desert Side-notched, and Cottonwood Triangular points) from the South Fork Shelter site were recovered from above the 72" level from which the 1370 B.C. date was secured. The Wagon Jack Shelter (site NV-Ch-119) at Eastgate (Heizer and Baumhoff, 1961) yielded a date of 980 B.C. (LJ-203) for the bottom of the midden, and thus provided a date for the Elko Eared and Elko Corner-notched points which are stratigraphically earliest at the site. Hidden Cave (NV-Ch-16), in the Stillwater Range near Fallon, has a radiocarbon date of 1094 $\pm$ 200 B.C. (L-28988) for the 32 inch midden (Grosscup, 1958, p.19), a stratigraphic unit from which 2 Elko Eared and 3 Humboldt Concave Base A points were recovered (Roust and Clewlow, 1968). The Rodriguez site (CA-Las-194), in Lassen County, California, has a radiocarbon date of 200 B.C. (L-3209) for the level associated with Elko points, and a date of 900 A.D. (I-3208) in association with Rose Spring Corner-notched and Eastgate Expanding Stem points (O'Connell and Ambro, 1968). At the Hesterlee site (NV-Pe-67) on the edge of Humboldt Sink near Lovelock, charcoal from the hearth of house pit E-2 dates at 1630 A.D. (UCLA-1071-D). This gives an approximate date for the Desert Side-notched, Cottonwood Triangular, and, perhaps, Rose Spring Corner-notched points that occur in abundance there (Cowan and Clewlow, 1968). Recent radiocarbon dates of 450 B.C. (UCLA-1069) and 950 B.C. (UCLA-1223) in association with Gypsum Cave points from Gypsum Cave, in southern Nevada, support Lanning's opinion that this point type was roughly contemporary with Elko Eared points (cf. Heizer and Berger, this report). Most recently, Newark Cave site (NV-WP-107) in eastern Nevada yielded C^{14} dates of about 85 B.C. (WSU-538) for the level associated most strongly with Elko Eared points, and of 1110 A.D. (WSU-463) for the level in which the Rose Spring Corner-notched and Eastgate Expanding Stem points occurred (Fowler, 1968, p.30). Thus it is evident that a number of dates from sites widely scattered throughout the Great Basin show a close correspondence with Lanning's estimates of the age of the Rose Spring material.

The best test of the Rose Spring site phase ages would be to date these by radiocarbon. With this intention five charcoal samples were dated in 1966 at the UCLA Institute of Geophysics. These samples provided a suite of dates (UCLA-1093A, B, C, D, E) which do confirm the original estimates. Samples UCLA-1093A, 1093B, and 1093E were collected during the 1956 excavations of R. A. Riddell, while samples UCLA-1093C and 1093D were obtained in 1961 by J. T. Davis. These samples, their ages and stratigraphic position are shown in Table II.

UCLA-1093A is stratigraphically from the Middle Rose Spring phase and the radiocarbon and estimated ages do not conflict: UCLA-1093B is stratigraphically Early Rose Spring, and again estimated and radiocarbon ages harmonize. Samples UCLA-1093C-E come from levels of the site below Early Rose Spring. These deeper layers were deficient in cultural materials such as projectile points, finds being limited to a small amount of obsidian debitage, 1 scraper, 1 blade, 1 drill, 1 core tool, and a few bits of charcoal. No projectile points were found below 84 inches from the surface, the level which marks, culturally, the bottom of the Early Rose Spring deposit. Lanning (1963, p. 268) believes the culture preceding Early Rose Spring to be the Pinto, known primarily from the Little Lake site 13.5 miles to the south (Harrington, 1957). UCLA-1093C-E may refer to this supposedly pre-Early Rose Spring cultural manifestation. Direct age comparison is not possible since the Little Lake site has not been radiocarbon dated. On the other hand, samples UCLA-1093C-E could refer to the earliest expression of the Early Rose Spring phase. A final decision cannot now be made due to lack of classifiable cultural material from below the 84 inch level. If 1093E does mark the earliest occupation of the site, this would agree with other evidence indicating either re-occupation or expanding settlement in the Great Basin at the end of the Altithermal temperature age (Baumhoff and Heizer, 1965). Whatever the case, the suite of dates contributes importantly to the chronometric foundation for the Early and Middle Rose Spring phases of the Rose Spring site, and are important as "anchor" dates for the Medithermal projectile point sequence in the Great Basin.



Key:
1. Rose Spring
2. Lovelock Cave
3. Wagon Jack Shelter
4. South Fork Shelter
5. Newark Cave
6. Rodriguez
7. Hidden Cave
8. NV-Pe-67
9. Gypsum Cave

Map 1. Great Basin Sites with Radiocarbon dates for projectile points.

Table I.

The Rose Spring Sequence

Proposed by Lanning, 1963

Phase	Depth (level)	Date	Point Types
Cottonwood	0"-24"	1300 A.D. -?	Cottonwood Triangular
Late Rose Spring	24"-36"	500-1300 A.D.	Cottonwood Triangular Rose Spring Corner-notched Eastgate Expanding Stem
Middle Rose Spring	36"-60" part of 60"-72"	500 B.C.-500 A.D.	Elko Eared Elko Corner-notched Gypsum Cave
Early Rose Spring	part of 60"-72" 72"-120"	1500-500 B.C.	Elko Eared Elko Corner-notched Gypsum Cave Humboldt Concave Base A
Little Lake	84"-120"	3000-1500 B.C.	Pinto Lake Mohave

Table II.

The Rose Spring Radiocarbon Dates

Sample	Depth	Age	B.C. date
UCLA-1093A	60-64"	2240 ± 145	290
UCLA-1093B	72-84"	2900 ± 80	950
UCLA-1093C	84-92"	3520 ± 80	1570
UCLA-1093D	96-100"	3580 ± 80	1630
UCLA-1093E	108-120"	3900 ± 180	1950

Table III.

C^{14} Dates for some Great Basin Projectile Point Types

Site	Sample	Age	Date	Associated Point Type
Hesterlee Site (NV-Pe-67)	UCLA-1071D	320 ± 50	1630 A.D.	Cottonwood Triangular, Desert Side-notched
Lovelock Cave (NV-Ch-18)	UCLA-1071F	1210 ± 60	740 A.D.	Rose Spring Corner-notched
Rodriguez (CA-Las-194)	I-3208	1050 ± 100	900 A.D.	Rose Spring Corner-notched, Eastgate Expanding Stem
	I-3209	2150 ± 100	200 B.C.	Elko Eared
Newark Cave (NV-WP-107)	WSU-463	840 ± 340	110 A.D.	Rose Spring Corner-notched, Eastgate Expanding Stem
	WSU-538	2035 ± 315	85 B.C.	Elko Eared
Gypsum Cave	UCLA-1069	2400 ± 60	450 B.C.	Gypsum Cave
	UCLA-1223	2900 ± 80	950 B.C.	Gypsum Cave
Wagon Jack Shelter (NV-Ch-119)	LJ-203	2930 ± 200	980 B.C.	Elko Eared, Elko Corner-notched
Hidden Cave (NV-Ch-16)	L-289BB	3044 ± 200	1094 B.C.	Elko Eared, Humboldt Concave Base A
South Fork Shelter (NV-El-11)	LJ-212	3320 ± 200	1370 B.C.	Humboldt Concave Base A, Humboldt Basal Notch
	UCLA-295	4310 ± 400	2360 B.C.	" " " " " "
	UCLA-296	4360 ± 300	2410 B.C.	" " " " " "

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IV. A MESCAL KNIFE FROM NEAR OVERTON, MOAPA VALLEY, SOUTHERN NEVADA

Robert F. Heizer

In December, 1969, my son Michael found imbedded in a ratnest in a low horizontal crevice on property owned by him about 5 miles northeast of Overton, Clark County, Nevada, an unusual mescal knife. The low crevice was apparently not occupied, and the knife was probably cached there by some Indian within the past century with the aim of later recovery and use. The knife is described here and notes on ethnographic usage and other archaeological examples are provided.

The handle of the knife (Fig. 1a) is a section of mesquite wood branch 24 cm. long and 3.5 cm. in diameter. The ends, somewhat rounded, are rough and the wood appears to have been cut with a rough chopping tool such as a stone cleaver or ax. Nothing which can be interpreted as cutting marks of a steel knife or ax are in evidence. The unusual feature of this mescal knife is in its having one stone and one iron cutting blade, both of which are set in line with the run of the handle opposite each other. The stone blade, of mottled yellow-brown flint, is set in an oval socket filled with dark brown pitch. The socket is 6.0 cm. long and 3.0 cm. wide. The exposed blade is 4.0 cm. wide, 2.3 cm. long, and 1.0 cm. thick in the center. The cutting edge is sharp and unabraded.

Opposite the stone blade is a metal one, similarly socketed, and held by a pitch mastic which is somewhat lighter in color, and fills the socket more evenly than the pitch holding the stone blade. The iron blade is 3.5 cm. wide, 2.0 cm. long, and 4 mm. thick. All three visible edges are ground down to a sharp edge, the only difference being that the forward edge is slightly convex and the side edges are straight. One has the distinct impression that the iron blade has been set in the handle at a later time than the stone blade. It is possible that originally the tool had two flint blades and that one was replaced by the blade of iron.

Other archaeological mescal knives are on record for the Overton area. Harrington (1942) describes a double bladed knife (Fig. 1b) found near Logandale which lies a couple of miles north of Overton in the Moapa Valley. This specimen, except for having both cutting blades of flint and roughly cut grooves around the shaft at each end, is practically a duplicate of the specimen presented here. Nothing is known of its occurrence, but the fact that it bears two stone blades encourages one to think of it as dating from pre-contact times. Harrington (1930:120-121) recovered a complete mescal knife from Paiute Cave, about 1.5 miles south of Overton. The simple wooden handle has

an iron blade seated in pitch (Fig. 1c). Harrington believes the specimen to be of Paiute manufacture. Another mescal knife (Fig. 1d) with an iron blade found in a rockshelter 3.5 miles southeast of the former town of St. Thomas, Clark County, is described and illustrated by Baldwin (1944). A second and similar specimen from a nearby shelter is described but not illustrated by Baldwin (op.cit). Both of these knives are associated with identifiable artifacts of Paiute manufacture.

Other archaeological examples have been recovered from northwestern Arizona, not far to the southwest and across the Colorado River from the Overton area. Fewkes (1898:571) illustrates a complete mescal knife (Fig.1e) with a single ground stone cutting blade which he recovered from a depth of 3.0 feet in a room at the Pueblo site of Honanki on Lower Oak Creek, south of Flagstaff. It is undated, but Fewkes believes the site to have been abandoned before the beginning of the historic period. I am indebted to G. Metcalf, Supervisor, Processing Laboratory, Department of Anthropology, USNM, for providing me with details on this specimen. Bartlett (1934:18-19) describes and illustrates a complete mescal knife from Medicine Cave (site N.A. 863) with a single flint blade (Fig. 1f). Like the Logandale knife (Fig. 1b) it bears an encircling groove near each end. Bartlett is uncertain of the age of the Medicine Cave specimen, but believes that it is either of Pueblo II or Yavapai manufacture.

Other mescal knives are reported to have been found near Alpine, Brewster County, Texas (Bartlett 1934:19; Harrington 1930:121). The only published Texas example seems to be the specimen illustrated by Martin (1939:80, Pl. XXXIII) which has a flaked flint blade set in an excavated socket and held with juagilla gum (Fig. 1g). The blade is reinforced by two parallel-laid twigs which are bound to the handle. This piece was recovered from Shumla Cave, Val Verde County, Texas. Two unusual examples of what may be a double-bladed mescal knife from Carved Rock Shelter, Sunny Glen Canyon, near Alpine, Texas collected by Victor J. Smith are described and illustrated by Sayles (1941:Pl.29, Fig. 2). A section of oak limb 31.5 cm. has a longitudinal slot cut through it from both sides and into this is inserted a round-based chert blade which is held in place by wedges of yucca stalk (Fig. 1h). This is the only known double-bladed mescal knife reported from Texas. The circumstances of their occurrence suggest that they are fairly recent.

The presently known archaeological distribution of this distinctive form of mescal knife thus ranges from Brewster and Val Verde Counties, Texas in the south to the Moapa Valley in southern Nevada in the north. Some examples may be prehistoric, as judged from their bearing stone cutting blades; others are clearly of historic manufacture, and are attributed with some probability to Southern Paiute manufacture. A number of tribes (Southern Paiute, Yavapai, Maricopa, Mohave) are reported to have used this form of mescal knife, but we are quite uncertain how ancient the form is since

the archaeological examples are undated.

The wide natural distribution of "mescal", a term used in a general way for a large number of species of century plant, Agave, which grow from 1000 to 5000 feet above sea level in the Sonoran and Transitional life zones (for distribution of species see Castetter, Bell and Grove 1938:13-27), and its wide recognition by native peoples as a food resource accounts for the wide occurrence of mescal pits in which the plant was roasted to make it edible. Castetter, Bell and Grove (1938:Fig. 4) and Greer (1965:Fig. 5) have mapped the distribution of such pits in the stretch between west Texas and southern California. Such pits are common in southern Nevada, the area which has produced a number of mescal knives, (Shutler and Shutler 1962: 22-23), Arizona (Baldwin 1944) and Texas (Greer 1965:Fig. 5; Castetter, Bell and Grove 1938:Fig. 4).

The mescal plant was cut off at its base with a sharp-edged or chisel-pointed tool made of hardwood which was pounded with a stone (Spier 1933:55; Spier 1928:105-106). The thorny-edged leaves were then cut off with a mescal knife (perhaps better termed "mescal hatchet" by Spier 1933:55) and the remaining crown (also called the "heart" or "cabbage") was baked. The baking was done in a dug pit in which stones were laid, and on which a fire was built. The mescal cabbages were then laid in the pit on the heated stones, covered with a layer of grass, topped with a layer of earth and allowed to cook (actually steam) for from 24 to 48 hours. This method of gathering and roasting is widespread in the Southwest, and is reported for the Maricopa, Havasupai, Jicarilla, Mescalero, White Mountain and San Carlos Apache, Navajo, Southern Paiute, Pima, Cahuilla and Huichol (Spier 1928:119; Spier 1933:55-56), the Paipai, Cocopa, Kiliwa, Papago, Diegueno (Castetter and Bell 1951:202; Henderson 1951; Greer 1965), the Yavapai (Gifford 1932:206-207), the Walapai (Mekeel 1935:49, 52-53), the Cochimi, Concho, Jumano, Sonora, Sinaloa, Culiacan and unnamed tribes of Nuevo Leon, Jalisco and Mexico in Mexico (Beals 1932:164).

The mescal knife or hatchet with a wooden handle and flint blade set in the center is a form which will be preserved archaeologically only rarely. How widely such implements were used in prehistoric times can probably be determined only by identifying the flint blades found in open sites. Kowta (1969:55) discusses the implemental assemblage used for the collection and preparation of Agave and this is a first step toward our understanding of the technological complex associated with the prehistoric utilization of this important food plant.

Explanation of Illustrations

Figure 1. Mescal knives from Nevada, Arizona and Texas. For location and description of specimens see text.

Figure 2. Infrared spectra of pitches (KBr pressed plates).

a. Spectrum of pitch holding iron blade;
b. spectrum of pitch holding stone blade.

Plate 1. Mescal knives from Southern Nevada and Texas.

a-c From near Overton, Clark Co., Nevada
- a. profile
- b. stone blade
- c. iron blade

d-e From west Texas (site unknown). Specimen in Sul Ross College Museum, Alpine, Texas. Mus. No. SR 1058A. By permission of the Director.

TABLE 1

Archaeological mescal knives

	1	2	3	4	5	6	7
Handle length	24.0 cm.	24.3 cm.	21.7 cm.	23.0 cm.	22.8 cm.	31.6 cm	33.6 cm.
Handle diameter	3.5 cm.	3.3 cm.	4.5 cm.	4.5 cm.	4.5 cm	3.7 cm.	4.2 cm.
Number of cutting blades	2	2	1	1	1	1	1
Material of cutting blades	1. Iron 2. Flint	1. Flint 2. Flint	Iron	Iron	Iron	Basalt	Flint
Material of handle	Mesquite	Willow(?)	Mesquite(?)	Mesquite	?	?	Oak(?)
Treatment of handle	Plain	Grooved near each end	Plain	Tapered ends	Plain(?)	Plain	Grooved near each end

1. From 5 miles NE of Overton, Clark Co., Nevada (Fig. 1a).
2. Near Logandale, Clark Co., Nevada (Fig. 1b).
3. Paiute Cave, Clark Co., Nevada (Fig. 1c).
4. Near St. Thomas, Clark Co., Nevada (Fig. 1d).
5. Near No. 4, Clark Co., Nevada (Baldwin 1944:331).
6. Honanki Ruin, Arizona (Fig. 1e).
7. Medicine Cave, Arizona (Fig. 1f).

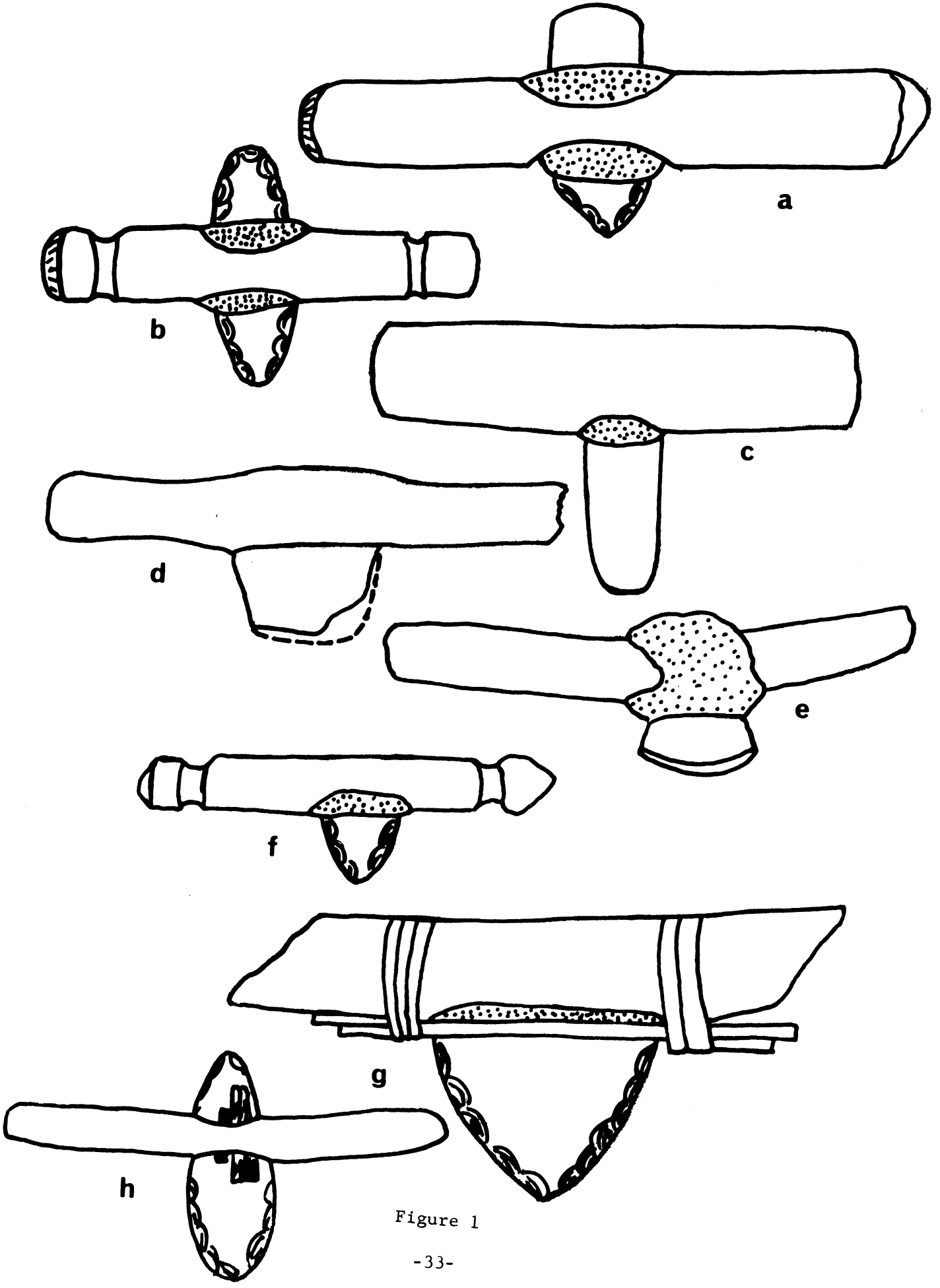
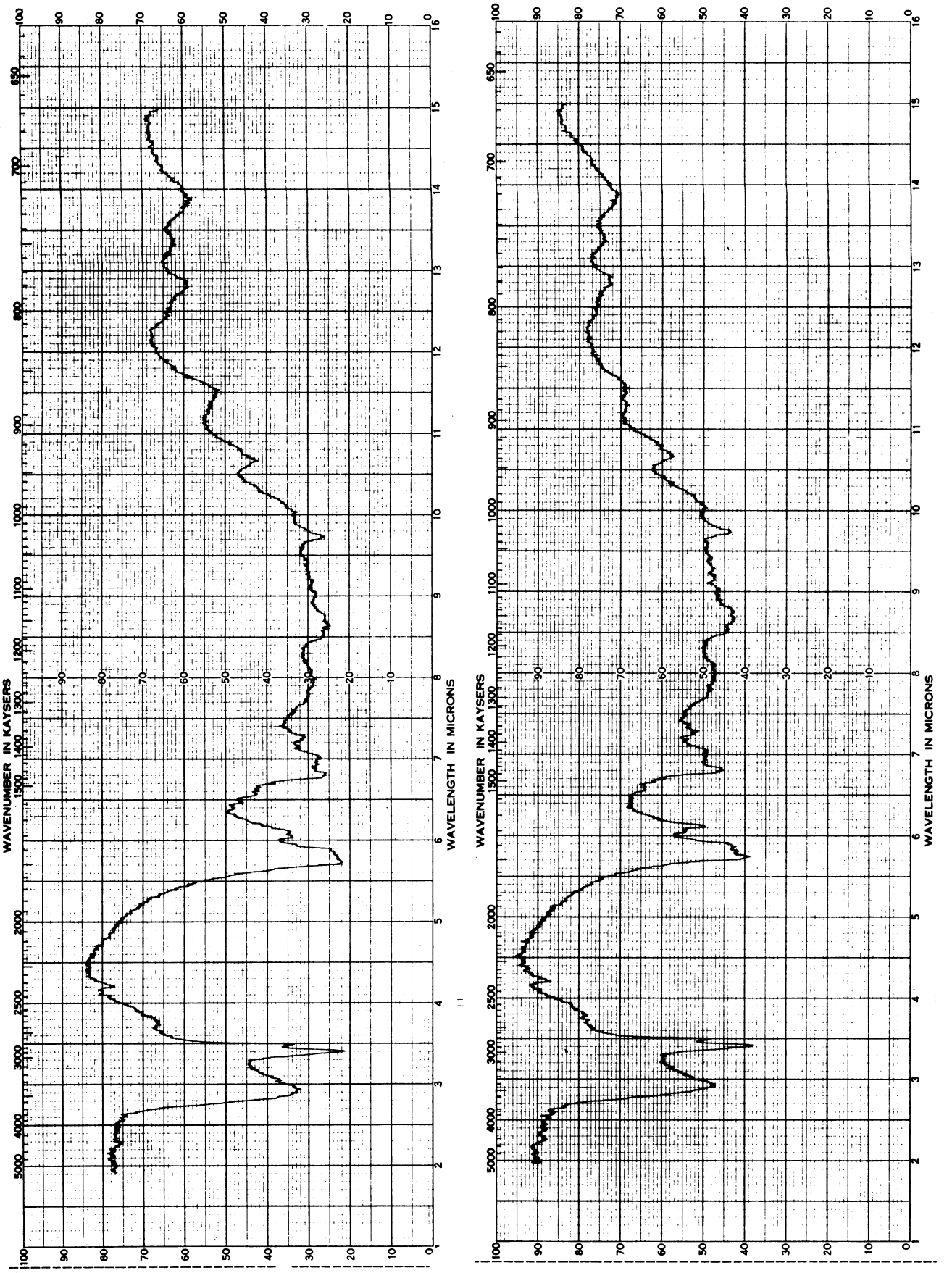
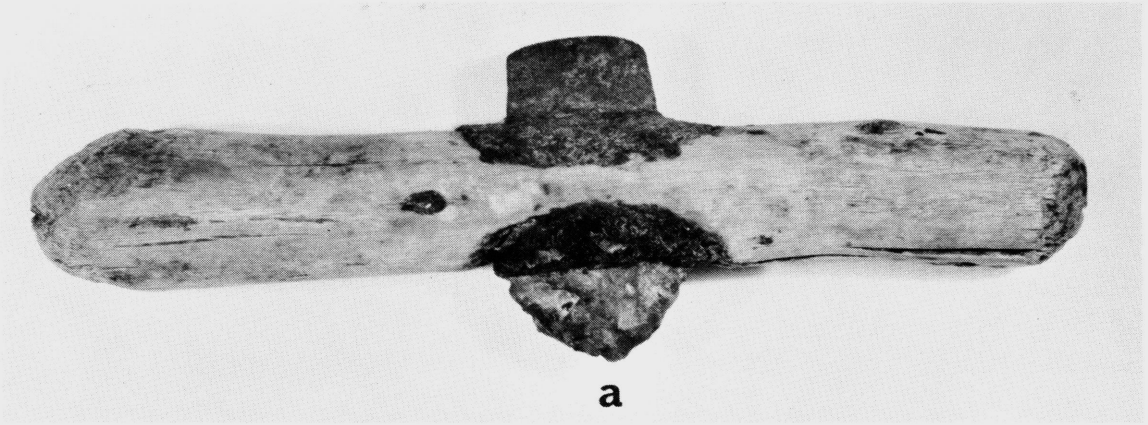


Figure 1


WAVENUMBER IN KAYSERS
WAVELENGTH IN MICRONS
WAVENUMBER IN KAYSERS
WAVELENGTH IN MICRONS

a b

Figure 2



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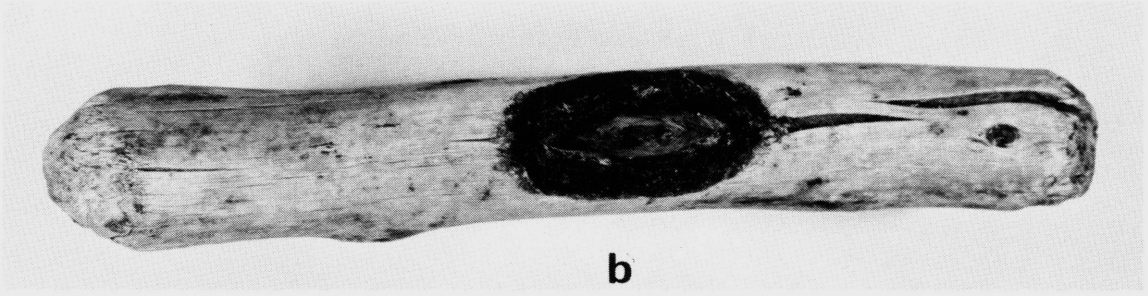

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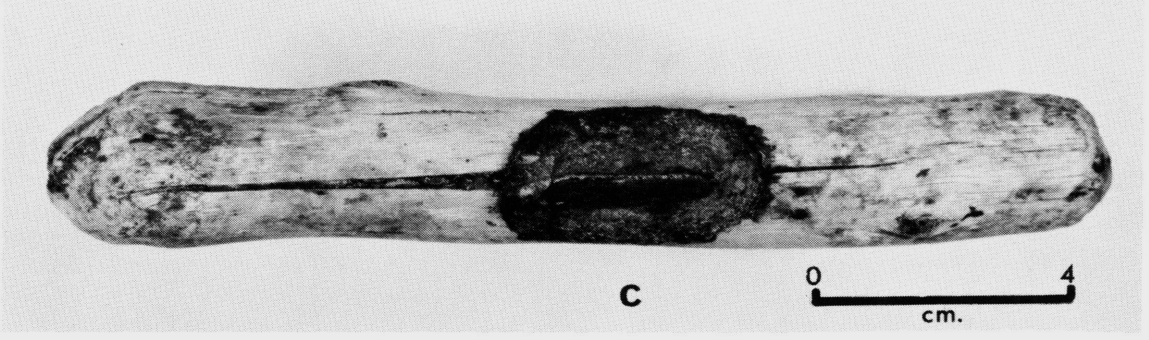

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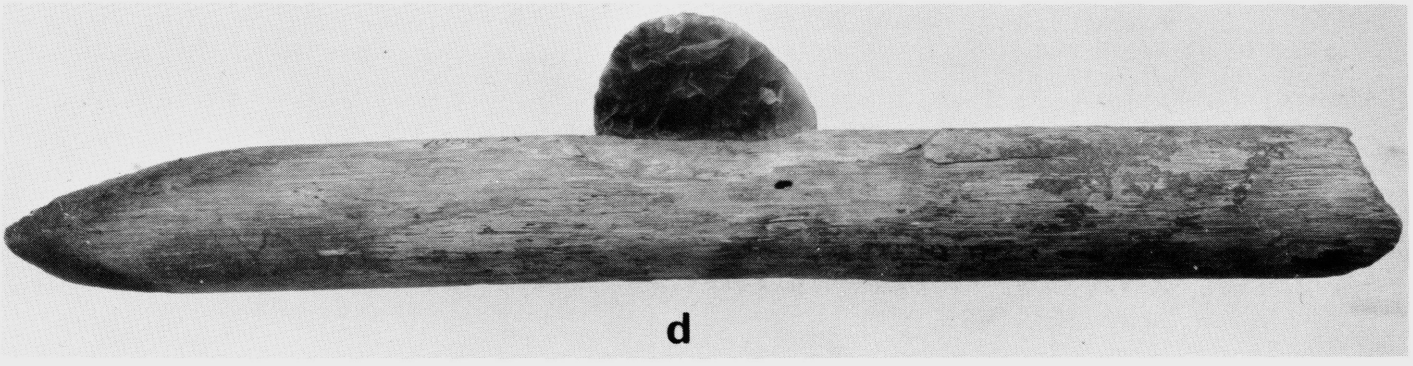
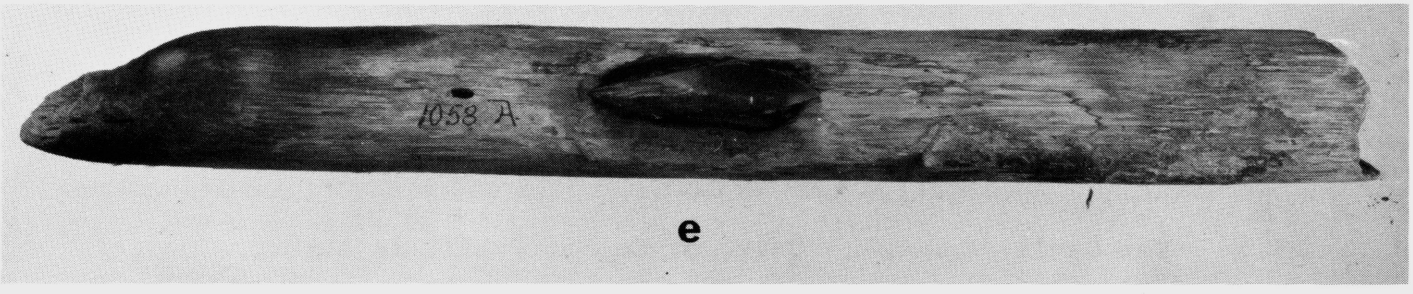


d



e

Plate 1

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APPENDIX 1. Analysis of pitch samples

Fred H. Stross

Two samples of pitch, one from the filling of the excavation holding the stone blade and the other from the gum holding the iron blade of the mescal knife shown in Pl.1a-c were analyzed by infrared spectroscopy.

The two pitches showed visual differences, that holding the stone blade being dark brown and that holding the iron blade being lighter and reddish in tone. The analysis was made to determine if the two gums or pitches were different or the same.

The samples were ground in KBr and formed into pressed plates for infrared spectroscopic analysis. The spectra were obtained in the region of 2 microns to 15 microns with a Beckman Model IR.4 spectrophotometer. The spectra show the two samples to be identical. Fig. 1a is the spectrum for the pitch associated with the iron blade; Fig. 1b is the spectrum of the pitch holding the stone blade. These spectra are quite similar to those of ancient and modern pitches from Nevada published earlier[1], but there are enough small spectra differences to indicate that the pitch of the mescal knife from near Overton comes from a different tree. Identification of the source of the pitch could probably be made by analyzing tree resins from this area of southern Nevada.

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[1] A. C. Jones, J. R. Weaver and F. H. Stross. Note on Indian Wood Carving in the Form of a Grasshopper Found in Lovelock Cave, Nevada. Univ. of Calif. Arch. Survey Report No. 70:123-128, 1967.

V. NOTES ON BEAD STRINGING AT LOVELOCK CAVE, NEVADA

John Carroll

Beads and ornaments made from Pacific Coast shells have been found in archaeological sites throughout North America. The abundance and stylistic variation of shell beads as they occur over time in archaeological sites make them useful as chronological guides, and they are used in parts of California for this purpose in the same way as projectile points in the Great Basin and ceramics in the Southwest.

Shell beads were chiefly employed in body ornamentation (wrist bands, necklaces, or sewn on clothing) and are found in open sites, usually associated with graves. By studying these beads *in situ*, one can at times determine the function which they served, but the methods by which the beads were strung is largely unknown since the cordage has disappeared.

A number of shell beads strung with their original cordage have been found in Lovelock Cave (NV-Ch-18), a site containing dry refuse deposits. Loud (Loud and Harrington 1929:105, Pl. 17:a,b) in 1912 found three examples of a series of spire-ground *Olivella biplicata* shells. Two of these were tied to two base cords by a third cord (Fig. 1*a*,*b*), and one set was strung with a single element technique employing a "crochet" stitch (Fig. 1*c*). Loud and Harrington in their joint excavations at the cave in 1924 found three more examples of strung beads (Figs. 1*d*-*f*). Two of the specimens (Figs. 1*d*,*e*) were classified by Bennyhoff and Heizer (1958:90-91) as type 1*a*; the third specimen (Fig. 1*f*) was made of flat-disk *Olivella biplicata* beads (cf. Grosscup 1960:37-39). The technique of stringing for two of these examples of beadwork has been described by Orchard (1929:23-24) as shown here in Figures 1*e*,*f*.

During the Spring quarter of 1969, a University of California field course in archaeology was held near Lovelock, Nevada. Excavation was concentrated in Lovelock Cave and at the Humboldt Lakebed site (NV-Ch-15) on the former shore of Humboldt Sink. Excavation in the west end of Lovelock Cave involved removal of part of the much-disturbed occupation fill from the West Crevice area. In the debris in this deposit were found four short lengths of overlapping Olivella disk beads which are similar to other Lovelock specimens (Bennyhoff and Heizer 1958:Fig. 1, No. 41). One of the specimens found in 1969 is shown in Fig. 1*g*. The strung fragments are thought to be portions of a necklace or of a bracelet.[1] The cordage has been identified as probably *Asclepias speciosa* (Daniel Franck, personal

[1] The desiccated mummy of an infant, presumably from Lovelock Cave, displayed in the Nevada State Historical Society Museum in Reno, has on its wrist a bracelet made of beads that appear to be strung *Olivella* shells.

communication, 1970) and is two-ply S-twist. Three cords are used, with the bead strung on the middle cord of each braid.[2] Both the three plait braid and the single element "crochet" technique allow the disk beads to lie flat and overlap one another, forming a "shingling" effect. Examples of shingling of rectangular Olivella beads attached to a textile surface are known in Central California from site NR-236 (Carquinez Mound, Solano County) (Gifford 1947:96, Fig. 35, Type X3a1) and from the Walker Slough Mound (Meredith 1900:275, Fig. 413).

From another portion of Lovelock Cave in 1969 (area "AN") came a string of 15 short Dentalium beads (Fig. 1h). These were examined by Dr. Rudolf Stohler, Department of Zoology, University of California, Berkeley, but are so beachworn that species identification could not be made. The beads are threaded on an S-twist two-ply cord of dicotyledon fiber, probably Asclepias speciosa (identification by D. Franck, personal communication, 1970).

[2] Braid was commonly used by the cave's inhabitants. The 142 pieces of braid found at this site include examples of 3,5,6,7,16, and 18 strand braid (Loud and Harrington 1929:82-83).

EXPLANATION OF FIGURES

Fig. 1a: Two cords laid parallel forming a flat background against which rests one side of the strung bead. A third cord is tied around the other two employing two overhand knots. Lowie Museum No. 1-10345 (after Loud and Harrington 1929:10, Fig. 17a and pl. 53a).

Fig. 1b: Variation of three cord stringing in which only a single overhead knot is employed. Lowie Museum No. 1-19343 (after Loud and Harrington 1929:105, Figs. 17b and pl. 53b).

Fig. 1c: Single element "crochet" stitch. Lowie Museum No. 1-19344 (after Loud and Harrington 1929:105, Fig. 17c).

Fig. 1d: Detail of tying Olivella shells to a base composed of two cords. Museum of the American Indian No. 13/4654 (after Orchard 1929:23, Fig. 8).

Fig 1e: Method of assembling shells with a "crochet-like" stitch. Museum of the American Indian No. 13/4653 (after Orchard 1929:23, Fig. 9).

Fig. 1f: Disk beads employing the same stitch as in Fig. 1e. Museum of the American Indian No. 13/4660 (after Orchard 1929:24, Fig. 11).

Fig. 1g: Disk beads employing a three plait braid. UCB Lovelock Cave (NV-Ch-18) Field Catalog 1968-1969, specimen No. 37:815.

Fig. 1h: Strung Dentalium beads on a single cord. UCB Lovelock Cave (NV-Ch-18) Field Catalog 1968-1969, specimen No. 53:1204.

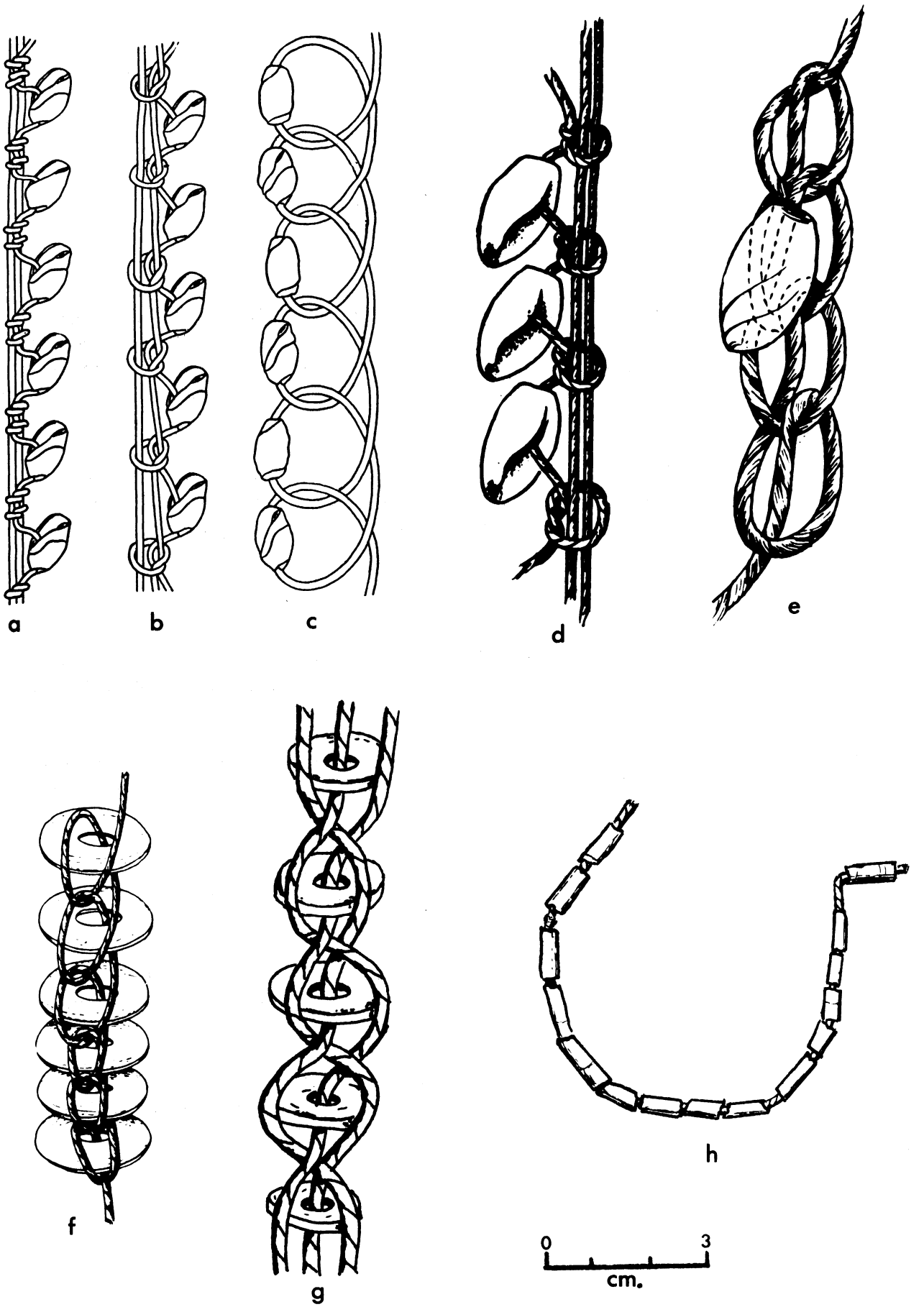

Fig. 1. Bead stringing methods, Lovelock Cave, Nevada.

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VI. A STUDY OF WEAR PATTERNS ON HAFTED AND UNHAFTED BIFACES FROM TWO NEVADA CAVES

Thomas Roy Hester

INTRODUCTION

The purpose of this brief paper is to present the results of a study of use-wear evidence on several hafted and unhafted chipped stone bifaces recovered from Nevada caves. Since no alteration of the stone has occurred in these pieces, they are ideal study examples.[1] They still retain organic residues which, when analyzed, may indicate the substance with which they were in contact. The specimens were obtained during excavations at two cave sites in the Humboldt basin of west-central Nevada. One hafted biface was found in 1912 by Loud at Lovelock Cave, and a brief description of it was published by Loud (Loud and Harrington, 1929:108, Pl. 55,b). During the investigations at nearby Humboldt Cave in 1936, Heizer and Krieger (1956:30, Pl. 15) discovered three hafted bifaces and two associated unhafted bifaces in a cache. All of these specimens are now in the collections of the Lowie Museum of Anthropology, Berkeley.

Both Loud and Heizer and Krieger described these artifacts as "knives". However, since no obvious superficial wear was apparent, it seemed desirable to subject the specimens to microscopic analysis in the hope of ascertaining their original function.

METHODS

All six artifacts were carefully examined, following analytical techniques suggested by Semenov (1964) and MacDonald and Sanger (1968). The primary tool employed was a binocular microscope, with magnification powers up to 75X. Initial microscopic examinations revealed the presence of various residues adhering to the bodies and lateral edges of all of the bifaces. In order not to alter these residues, it was decided not to opaque the study surfaces with any solutions, such as silver nitrate, methyl violet or India ink (see Semenov, 1964:24-26; Mirambell S., 1964:9).

RESULTS

The observations recorded during the study are presented here. Some additional descriptive data are also provided.

Specimen 1-19219 (Lovelock Cave; Fig. 1,d). Loud (Loud and Harrington, 1929:108) described this specimen as follows:

> ". . .a knife made of a material which, if obsidian, is of an unusually opaque quality. It is bound with sinew to a handle of wood. The dimensions of the knife blade are 80 mm. in length, 36 mm. in width and 11 mm. in thickness."

The material from which the biface is fashioned is a black flint. The wooden haft is 73 mm. in length, with a maximum diamter of 17 mm. It is polished, and the proximal end of the haft is pointed.[2] Overall weight of the specimen is 63 grams. The artifact was found in association with the skeletal remains of several individuals (Loud's Lot 32; see Loud and Harrington, 1929:172, 181). Other artifacts with the burial included basketry fragments, clay balls, and a large unhafted biface.[3]

The hafted biface has light dulling along both lateral edges. The protrusions (the convex projections along the sinuous lateral edge) along the edges show the most wear, in the form of dulling and blunting; a slight glossy sheen is also apparent. The heaviest dulling, with an accompanying slight crushed effect, is evident in the concavities between the protrusions. On both sides, there is heavy dulling on the areas of the edge near the haft (for approximately 14 mm. above the haft on one edge and 12 mm. above it on the other). Nibbling is present on a portion of one edge.[4]

Striations resulting from use (see Semenov, 1964; Wilmsen, 1968) were observed on one face near one lateral edge. One area (see Fig. 2,a) consists of light striations running almost perpendicular to the edge. The second area has a number of striations in a group parallel to the lateral edge (Fig. 2,b).

Specimens 1-42793, 1-42794, 1-42795 (Humboldt Cave; Fig. 1, a-c). These are three hafted specimens found in Cache 10 at Humboldt Cave. In each instance, a chipped stone biface has been set into a notch cut into a solid wooden haft; the bifaces are secured with resin (probably piñon pitch), and sinew is bound around the haft below the base of the biface. For a detailed description of these specimens, see Heizer and Krieger (1956:30). The dimensions of each artifact are presented in Table 1.

All exhibit very similar wear patterns. The lateral edges have only very light dulling, with the protrusions along the edges blunted and more heavily dulled. Specimen 1-42793 has heavy dulling on the lower 1/3 of one lateral edge, as well as heavy dulling, nibbling, and crushing near the distal tip on the same edge. The opposite lateral edge has heavy dulling for 17 mm. above the base. Specimen 1-42794 has a heavily dulled area, with the protrusions blunted, near the base on one edge. Wear patterns are much the same on specimen 1-42795. At the tip of that specimen there are two proximally-directed fractures (neither over 2 mm. in length; see Fig. 2,d) which under the microscope resemble burins (Epstein, 1963). The tip where these two facets intersect is blunted and dulled.

Specimens 1-42796, 1-42797 (Humboldt Cave, Fig. 2, e,f). These two unhafted bifaces were also found in Cache 10 of Humboldt Cave and described by Heizer and Krieger (1956:30). Dimensions appear in Table 1. Specimen 1-42796 (Fig. 2,f) seems to be the most heavily used of all of the studied

examples. The lateral edges are extensively dulled, with the protrusions almost totally obliterated by blunting. One edge, somewhat less dulled than the other, has one area of very heavy dulling extending for 7 mm., at a point 34 mm. above the basal edge. The basal edge itself has little or no dulling, while the distal tip is blunted, with a light gloss.

Specimen 1-42797 (Fig. 2,e) has a heavily dulled area along one lateral edge near the tip. Both lateral edges are considerably more dulled than their hafted counterparts. The protrusions are blunted and polished; dulling extends into the concave recesses of the edge, and ridges of flake scars near the edge are sometimes dull and glossy. There is some light dulling and blunting along the basal edge. On both lateral edges near the base there are heavily dulled areas.

Specimen 1-42796 must have been used after the accumulation of certain of the residues still adhering to it, for there are two striations incised on one small patch of the soft substance. These striations are about 5 mm. in length (see Fig. 2,c) and run almost perpendicular to the edge. The lateral edge in this area is very heavily dulled.

SUMMARY AND INTERPRETATIONS

The most common form of wear revealed on all of the bifaces was dulling of the lateral edges. This dulling varied from uniform light dulling over the entire edge length to heavy dulling in restricted areas. Striations resulting from use were absent from all but two specimens. Where they occurred, the striations were either parallel or perpendicular to the lateral edge. Protrusions along the lateral edges were generally blunted and polished from wear; on one specimen they had been mostly worn away. The distal tips showed occasional blunting and polishing and one specimen there are two very small burin-like facets. Gloss occurs randomly, usually on the protrusions and in one instance on some flake scar ridges adjacent to a lateral edge. One trait which showed up on most specimens was heavy dulling and crushing on the lateral edges in the vicinity of the base. This type of wear may be the result of the hafting technique employed; perhaps the strongest part of these composite tools was the area of the biface nearest the haft, and thus this area was used for the more demanding tasks, resulting in heavier wear.

Several studies have described the types of stone tool wear which result from various aboriginal activities (Semenov, 1964; Witthoft, 1955, 1967; Frison, 1968; Wilmsen, 1968; Shafer and Hester, 1970). The more detailed studies of Semenov are the most applicable in the present discussion, especially his comments on wear patterns found on upper Paleolithic meat knives (pp. 101-107). The cutting of meat with knives (made on blades) resulted in dulling along the lateral edges of the specimens, as well as striations parallel to the blade edge or slightly inclined toward it. These striations (somewhat reminiscent of those present on the Humboldt basin specimens)

indicated to Semenov (p. 106) "...that the knife was deeply embedded in the material being worked, and operated with a one-way or two-way 'sawing' movement necessary for the cross-cutting of muscular fibre, tendons and sinews". However, he also notes that some "meat knives" have polishing which covers the "...hollows of the facets and could have been formed only if the working part of the tool had encountered resistance from a pliable but elastic mass which made contact at all points on its surface. Such material could only have been the muscles, adhesive tissues and internal organs of an animal's body" (p. 104). This type of extensive polish is absent from the Humboldt basin artifacts.

Witthoft (1955:20) describes wear patterns on knives which he believes were used in hide preparation. This wear takes the form of blunting and smoothing along the edge of the tool, with some nibbling, and "...many fine scratches" on the face of the tool adjacent to the lateral edges. Here again, only a portion of Witthoft's findings are applicable to the specimens under discussion. Smoothing and blunting are present along the edges, but nibbling and striations (fine scratches) are rare.

The extensive dulling of the lateral edges of the Humboldt basin hafted and unhafted bifaces suggests that they functioned as knives. The parallel striations indicate (based on Semenov's data) that these tools could have been used in a "sawing" motion, perhaps in one-way or two-way movements. The perpendicular striations indicate that they also may have been used in a pulling or pushing motion, with the biface horizontal to the holder; a method in which the tool was vertical and used in up or down motions may have also been employed.

Some of the wear characteristics listed by Semenov and Witthoft for meat/hide processing tools are absent from the Humboldt basin specimens. This may indicate that they were not used as knives for these tasks. On the other hand, it is possible that they could have been used for those activities, but certain factors (such as the manner in which they were used) prevented the formation of some of the characteristic wear patterns. Various other uses for chipped stone tools, including wood and bone working, stone-working and various types of abrading all produce wear patterns which are not seen on the Humboldt basin tools, and we can assume that they did not function in any of these capacities (Semenov, 1964; Witthoft, 1955; Wheeler, 1965; Sonnenfeld, 1962). One possible function to which these tools could have been applied was the processing of plant materials found in the lacustrine environment exploited by the aborigines of the Humboldt basin (Napton, 1969). Hopefully, the analysis of the organic residues adhering to these knives will tell us what types of materials were being processed.

In summary, these microscopic studies have revealed dulling and other forms of wear which identify the hafted and unhafted bifaces from Lovelock and Humboldt Caves as knives.[5] Loud and Harrington (1929) and Heizer and Krieger (1956) had previously suggested that these specimens were knives,

but they presented no detailed evidence to support such functional identifications. Similar hafted specimens occur in the Southwest (Morris, 1919; Guernsey and Kidder, 1921; Nusbaum, 1922[6]) and northern Mexico (Aveleyra Arroyo de Anda and others, 1956), and it would be of interest if these artifacts were studied to see what types of wear are present or lacking.

NOTES

[1] Flint artifacts from the surface of open sites may bear surface alterations due to sand blasting or thermal fracture. Wear pattern studies should ideally be carried out with specimens which have been protected since the time they were in use. Pieces from dry caves are best suited for such studies; those from open sites (even though they have been buried) are possibly physically altered through ground-heaving due to alternate wetting and drying or through chemical alteration. Though these latter modifications may be minor, they could nevertheless obscure some of the very slight or barely detectable use-wear evidence.

[2] All of the wooden hafts (on specimens 1-19219, 1-42793, 1-42794 and 1-42795) have vestiges of polish on them, probably the result of having been hand-held.

[3] The large biface (1-19220) associated with the burials of Lot 32 was briefly examined. It is interesting to note that the residues present on the hafted biface (1-19219) from this lot and the residues on the body and lateral edges of this biface are quite similar. This specimen (Loud and Harrington, 1929: Pl. 55,a) is 265 mm. long, with a maximum width of 58 mm., and a maximum thickness of 8 mm. The lateral edges show very little wear, other than random light dulling. There is a heavily dulled area on one lateral edge near the base, and the tip of the artifact is heavily dulled.

[4] The term "nibbling" is applied to a series of tiny vertical step (or hinge) flakes which occur along the tool edge and are the result of use.

[5] In addition to the six study specimens and the biface mentioned in Note 3, I briefly examined two lanceolate bifaces from Humboldt basin caves. One specimen is a bipointed biface (2-26555) found at the bottom of Leonard Rockshelter (see Heizer, 1951: Fig. 42e). It shows very little wear. There are occasional dulled areas on both lateral edges, with one rather heavily dulled area (about 5 mm. long) occurring on one lateral edge near midsection. A few protrusions along the lateral edges are only very slightly blunted, with random gloss. No striations were observed. Another lanceolate biface (1-19228; Lovelock Cave; see Loud and Harrington, 1929:Pl. 56,i) was examined, but showed no significant wear.

[6] Nusbaum (1922:127) described the wear he observed on a hafted biface from Kane County, Utah: "The point of the blade is blunt and the edges are dull and slightly beveled from opposite sides. This implement was undoubtedly a knife."

ACKNOWLEDGMENTS

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Abbreviations Used

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AMNH	American Museum of Natural History
-AP	Anthropological Papers
KASP	Kroeber Anthropological Society Papers
MAIHF	Museum of the American Indian, Heye Foundation
-INM	Indian Notes and Monographs
PM	Peabody Museum
-P	Papers
UC	University of California
-PAAE	Publications in American Archaeology and Ethnology

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Specimen	Overall Length	Length of Biface	Width of Biface	Thickness	Length of Haft	Diameter of Haft	Depth of Notch	Weight
1-47293	224	92	30	6	145	16	17	32
1-42794	238	95	38	6	143	17	22	41
1-42795	213	87	36	5	126	15	19	28
1-42796	-	106	41	7	-	-	-	36
1-42797	-	116	41	7	-	-	-	31

TABLE 1. Dimensions of Hafted and Unhafted Bifaces from Cache 10, Humboldt Cave. Measurements are in millimeters, and weights are in grams.

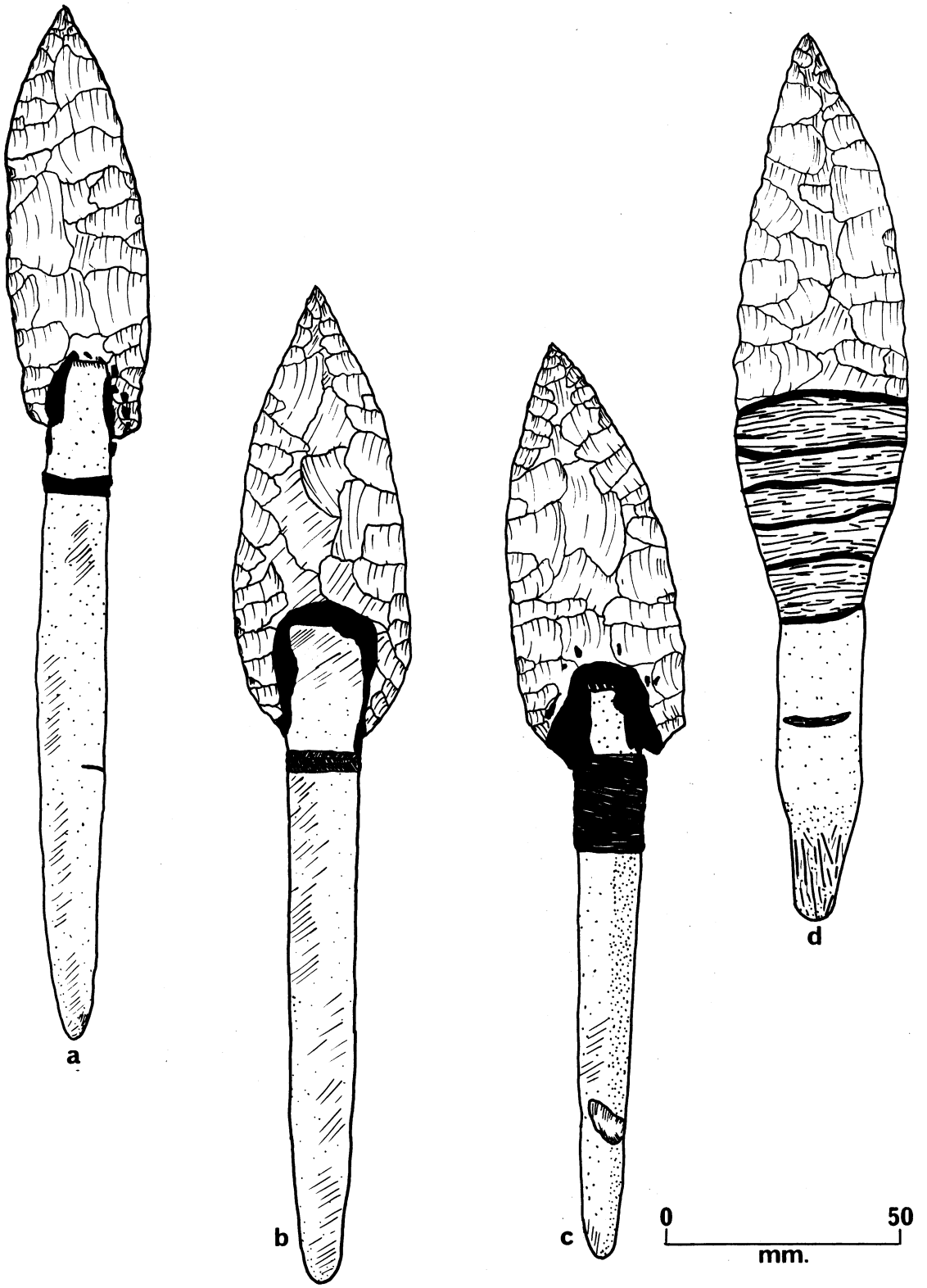

Figure 1. Hafted Bifaces from Humboldt and Lovelock Caves.
a, 1-42793; b, 1-42794; c, 1-42795; d, 1-19219.

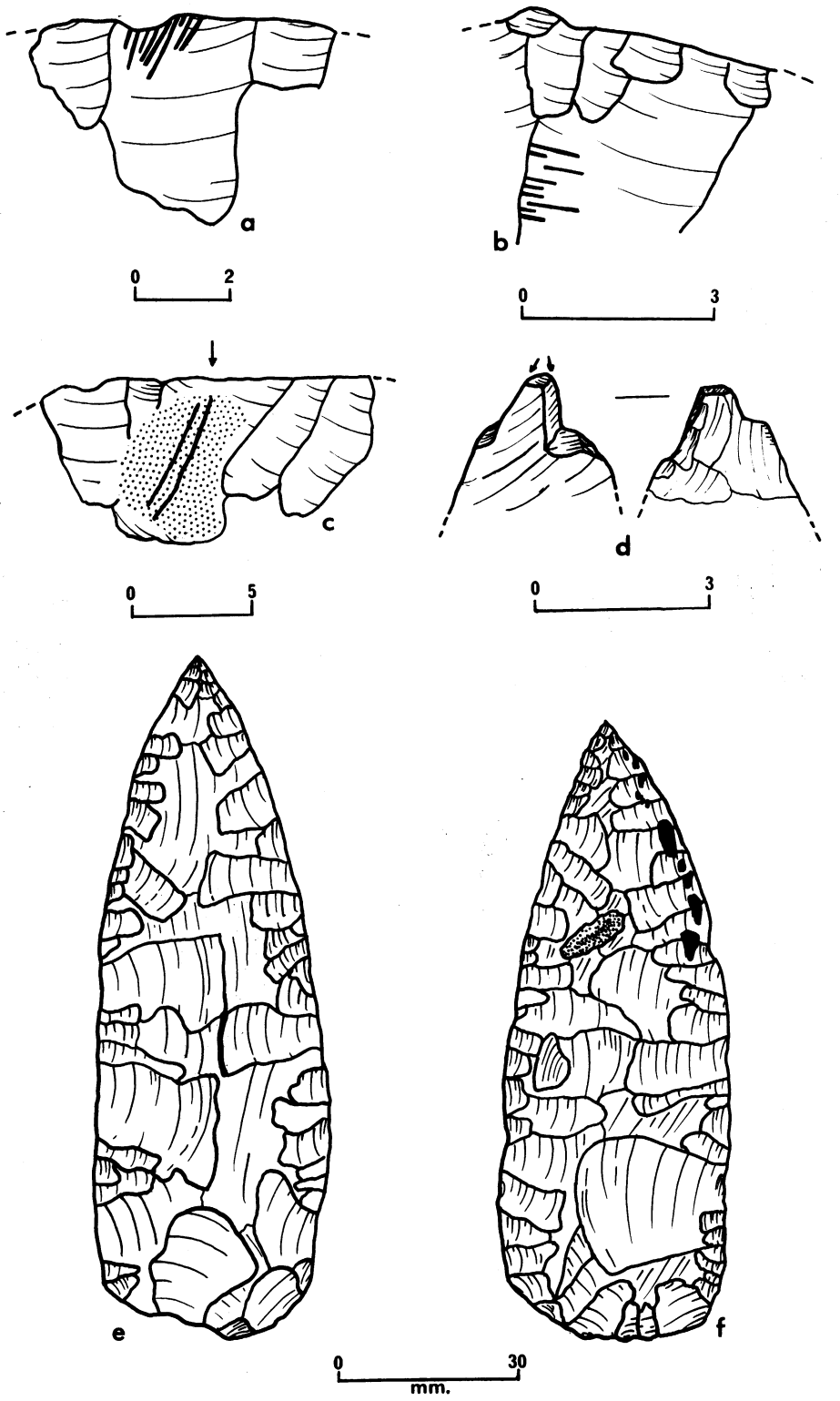

Figure 2. (scales are in millimeters). a, striations along one lateral edge of 1-19219; b, striations on 1-19219; c, striations across residue on 1-42796 (arrow indicates dulling on lateral edge); d, faceted tip of 1-42795 (arrows indicate direction of fractures); e, specimen 1-42797; f, specimen 1-42796.

VII. AN ETHNOGRAPHIC SKETCH OF THE PAVIOTSO IN 1882.

Editor's preface

The following article repeats to some extent information presented by Sarah Winnemucca in her book Life Among the Piutes (Boston, 1883), but contains enough new material to warrant being made more available as a sketch of Northern Paiute culture written n Indian of that tribe.

Sarah Winnemucca was the daughter of Old Winnemucca. Her mother was a daughter of Chief Truckee. The date of her birth is uncertain - it may have been 1844 or 1848. Sarah secured some education in a girls' school at San Jose and became an articulate and well known spokesman for Indian rights. She died in Montana in 1891. For further details see the publication in notes 15 and 19 following.

THE PAH - UTES*

Sarah Winnemucca

Our home is at the sink of Humboldt River, by the Carson Mountains. My father and I were both born there, about four miles from the railroad.[1] My Indian name is Somit-tone, meaning Shell-flower.[2] I was educated at the St. Marys Convent in San Jose.

On our mountains there are many pine trees.[3] We gather nuts for the winter. This was our principal food, which our women commenced to gather about the middle of August.[4] Our men used to hunt, and after that, our women go into the valleys to gather different kinds of seeds. The men go to fish along the Humboldt and Truckee rivers. They dry game of all kinds, and lay it up for winter. Later in the fall the men hunt rabbits. The furs are afterwards woven into blankets, called rabbit's-fur blankets. In the winter they all get together to locate their lodges, and all their supplies are collected and put into one place. They remain there about six months, having merry-making, eating, and drinking, and getting married; and they give themselves up to great enjoyment until the spring opens.[5] Then they go to the fishing-grounds; and when the roots begin to grow, the women dig them up. The name of this root in Indian is called yah-bah, and tastes like carrots. They boil them, like potatoes, and use them in soups, and also dry them. Another root is called camas root - a little root that looks like chestnuts; and kouse root, which tastes a little like hard bread. In early days, when white people came among us, they used to eat our food, and compare it with theirs. The same toil was gone through with every year, to

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* Reprinted from The Californian, Vol. 6, No. 33, pp. 252-256, Sept., 1882.

lay up the winter supplies; and in these days they always seemed to have plenty of food, and plenty of furs to keep them warm in the winter time.

Now you must not suppose that my people are weak or uncourageous. They are not what you call "slouches". There are the Utes and the Pah-Utes. We helped the Bannacks and the Umatillas in the war, because we were kindred of theirs.[6] They are our cousins; therefore we helped them. Now you say, why did they make war? I will tell you: you white men are too greedy. They had a little prairie, called the Camas Prairie[7] about fifty miles long by twenty wide. They wanted it because it supplied them with roots and prevented them from starving. The white man wanted it, because the roots were good for his cattle, and could make milk and beef and hides and tallow; so he tried to rob them of these lands. They did not like this, and because he dispised them, and would give them no redress, they killed him. But the cattle alone were not the cause of this war. The agents were worse than the cattle: what the cattle left the agents took. The agents buy their places for so much, and mean to make their money out of the poor Indians.

During my great-grandfather's time there was a tribe of Indians lived in our country, called Side-okahs, which means man-eaters, or cannibals.[8] They were not very large in numbers. They used to seek to kill us; and when they caught us they would have a grand feast. In this way they lived for a number of years, until my people made war with them. Then we had war and they fought too, but they did not kill many of us. They fought with bows and arrows, just the same as we did. They seemed to fear nothing; would even sport with and catch the arrows directed to them, which flew past. They could jump up and catch the arrows as they would pass over their heads, showing great agility. We fought them for a long time, until their number was quite small. They used to trap us, by digging pit-falls in the ground and wells in the paths. We were so afraid of them that we used to crawl at night; and sometimes our people would fall into these places after dark. When we have fought them some time, they saw that we were getting the best of them. Then they made canoes out of the tule grasses, and floated out on the Humboldt Lake; and they lived on the lake for a short time, but had to leave it again for the land. We kept pushing them out; then they went into a great cave. They did not remain there long, on account of lack of water. They then went into the tule marshes, but my people surrounded the tules, and set them on fire, and when they saw they were getting killed, they ran back into the cave. There they remained, and my people watched them when they would come out to get water, and then kill them. Then to make quick work of it, they went to work packing wood, and piled it up in front of the mouth of the cave; and as fast as my people filled the mouth of the cave, they pulled it inside, and of course the cave was very soon filled; and then they set fire to the outside. In that way my people killed all these cannibals, smothered in the cave.[9] Then we owned all their land, which was called the Side-okahs' land by other Indians, and it lay along the Humboldt River in Nevada.[10]

After the Side-okahs were exterminated we lived peaceably, now and then only having a little fight with other tribes - no tribes being allowed to settle among us. If they came on very important business they could stay a while; or if they came for a visit, they would be entertained by feasts and plays and dancing: amusing them all the time they were with us. They always brought presents to our chiefs, and they gave them presents to take back; but they were never allowed to settle with us or marry with us, each tribe maintaining its own individuality very pronounced; every nation speaking a different language.

Our language is not a written one, but oral; neither have we any signs to convey information to distant parties - only verbal messages sent by our warriors traveling on foot; as they could go over rough ground, rocks, and places that ponies could not, and they could endure more. If our relations were sick at a distance we would signal to the others by a fire on the highest top of the mountain. Three times during the night in the same place is a signal for sickness. For moving, our signal would be several fires all in a row, in the same direction we were to move. Fires of that description were peaceable ones; but we had, also, war-signals of fire. In olden times the way we used to make fire was with two sticks, both made of sage brush. One had a hole in the middle, and was about six inches long by two or three in diameter. This was laid down on dried grass, rotten wood, and such materials. Another stick was sharpened at the end like a top. This was put into the hole, and rubbed between the hands, causing a friction which ignited the materials, and we had a fire.[11] We never had flint,[12] nor knew its uses until the white man came to us. Signal fires for war are made in the daytime. A man takes a torch longer than his arm, made of sage brush bark, lighted at the end. He runs towards our encampment, and warns us that the enemy is coming, by making quick fires as he comes towards us, lighting the sage brush as he comes. Then when he gets in sight of the camp he halloos, gives a war-whoop, and runs three times around the encampment, and halts in front of the chiefs lodge. The warriors by this time are all ready to fight the enemy with their quivers and arrows. He then relates what he saw at a distance. In those early times we always had scouts and spies out, so that we would not be surprised by our enemies.

The traditions of our people are handed down from father to son. The chief is considered to be the most learned, and the leader of the tribe.[13] The doctor, however, is thought to have more inspiration. He is supposed to be in communion with spirits; and we call him "doctor", as you white people call your medicine-man; and the word is not taken from the English language, as may be supposed, but purely Indian. We do not call him a medicine-man, because he does not dose us, as your doctors do, and therefore we call him "doctor". He cures the sick by the laying on of hands, and prayers and incantations and heavenly songs. He infuses new life into the patient and performs most wonderful feats of skill in his practice. It is one of the most solemn ceremonies of our tribe. He clothes himself in the skins

of young, innocent animals, such as the fawn; and decorates himself with the plumage of harmless birds, such as the dove and humming-bird and little birds of the forest - no such things as hawks' feathers, eagles', or birds of prey.[14] His clothing is emblematic of innocence. If he cannot cure the sick person, he tells him that the spirits of his relations hover around and await his departure. Then they pray and sing around his death-bed, and wait for the spirit to take its flight; and then, after the spirit leaves the body, they make merry, because he is beyond care, and they suppose in heaven. They believe there is only joy in that place; that sorrow is before and not after death; that when the soul departs, it goes to peace and happiness, and leaves all its misery behind.

The warrior is the reverse of the doctor. The warrior wears eagles' feathers during the battle. He wears the claws of an eagle around his neck and head. The eagle is our national bird; the Americans taking that emblematic notion from the Indians in the early days of their nation. Some braves that have ridden in the battle front, and have only been engaged once or twice, wear the claws of a grizzly bear, to show that they have been in battle; the same as the medal that was given to my brother Natchez for saving three men's lives, showing his bravery.[15]

I will now speak about the chief. His rank is inherited from father to son, the oldest son being the chief by law. If he is dead, the one next to him becomes chief; or, if there are no sons, the next male relative; but never a woman. The custom of having more wives than one arose from the capture of other tribes during war.[16] If the women were pretty, the chief claimed them - but only one wife. The first married is claimed as legal and head of the rest, and is acknowledged in public as the chief's wife. The others are not called wives, but merely assistants - <u>pe-nut-to-no-degua,</u> in Indian.[17] The heirs of the first wife, and she herself, take precedence over the others. The chief, as also head of every family, is supposed to teach his children the traditions of the tribe. At times of leisure in the evening, and at twilight, these traditions are related around the camp-fires to eager listeners. No note of time is taken, and no record of ages is known. Once in a while, when the spirit moves the chief, he arises and speaks in a loud voice to his people. At these times, all work must cease. If a woman is cooking a meal, it must be left undone. All fold their hands, incline their heads, and listen to what he has to say; and then, when he is through, they go on again with their work, as left before he commenced to speak. Before every event, the chief gets up first in the morning, and the people are warned to get ready. If it is for a fishing excursion, or to hunt deer, or for any other excursion, he tells them to get ready - all that are to go. The old women and children stay behind in the lodges, while the young married women and daughters accompany their relations to carry the game which is caught by the braves.

These excursions sometimes last ten days, the people remaining wherever night overtakes them. When through, they return to their lodges, having great

rejoicing; and divide their game with the poor and aged and sick - no payment ever being required for such attention. Their belief is to have what they can enjoy on earth, and share it with each other, as they cannot carry anything out of this world. When they die possessed of horses and other goods, their wearing apparel is given to the poor, and some portion of it is buried with them. Horses are generally killed, for they think the dead man will not have any further use for them; and this is considered the last token of honor and respect that can be shown on this earth to the memory of the dead. The way that my people mourn for their dead is by cutting their hair close to their heads and laying it on the body of the dead to decorate it. The hair of his wife and that of his children, braided and ornamented with beads, is laid upon the dead man's breast; and if the wife refuses to part with her hair to thus honor her husband, she becomes the object of pity and scorn, laughed at, spit upon, and abused by the whole tribe. Thus they seldom refuse to part with their hair. The doctor also contributes ornaments from his person, and is not allowed to doctor any other sick person for some time, until he again gets into favor by some prophecy or inspiration supposed to come from the spirits. These are old traditions. Nowadays he knows his value. He will not attend a patient unless he is paid, as white folks pay their doctors. Thus we follow your customs as our association grows with you. Our doctor now charges a fee of five dollars, or as the case may be, as white folks do.

Indian girls are not allowed to mingle freely with the braves; never go out walking or riding with them; nor have anything to say to each other. Even in courting, the same strictness is observed. A young brave takes a notion to marry a young girl, but cannot do so until he has been declined. The woman removes from the rest of the family to a small wickeup, or lodge, where she remains one month by herself, abstaining from flesh, and living only on seeds or berries. She must be very industrious during that time, going out every morning at daybreak to gather wood and logs, which she arrays in five different piles. This labor is repeated at noon and at sundown. Every five days she is acknowledged by the other women and men to be a young lady ready to marry, and at these times the wood is set on fire, she is jumping over the piles while they are burning. Eating, drinking, and dancing are indulged in every fifth day. Then at the end of the month she returns to her father, casting away all her old clothing, and appearing before her parents in new robes made of buckskin.

The ceremony of courtship is as follows: the brave seeks the place where the Indian maiden is at rest. If she discovers him, she gets up and goes away. He never follows here, but comes again the following night, and so on indefinitely. Then when her parents give consent to their marriage, she is given a feast, at which he is invited to partake. At no other time is he allowed to eat with the family. The ceremony of marriage is very simple. The lady passes the brave some food in a dish. He takes it and sets it down; then they are considered man and wife. They remove to a lodge

by themselvers if able; if not, they remain in their father's lodge. When the first child is born, they go by themselves and work for others, remaining that way one month. They do not eat meat of any kind during this period, and bathe every five days. After that they return to their old home again. Deformed children among this people are almost unknown.

Cooking is performed in willow baskets woven so tight as to hold water. Seeds are ground between two stones.[18] A fire is built, and small stones are thrown into it. When hot, these are dropped into the basket that contains the water, causing it to boil, when the meal is stirred in, and hot rocks continually thrown in until the mush is cooked. Meat for stews and soup is cooked in the same manner. In early times meat was generally eaten this way, and the use of salt was not known until after the advent of the white man.

Virtue was a quality whose absence was punished by death - either by burning alive or stoning to death. My people are not so severe in these later days.[19] The ceremony of marriage is not so strictly carried out as in olden times. They take a woman now without much ado, as white people do, and leave them oftener than of old. One of the latest evidences of civilization is divorce - an indulgence taken advantage of to abandon an old wife and secure a young one. They argue that it is better for them to do so than to leave their young women for the temptation of the white man.

In 1867 I was interpreter for my people; but even they had nothing. The game has been all killed, except a few rabbits. The pine trees have all been destroyed, so that we can get no more nuts. The cattle have trampled out the grass in our little valleys, and we can dig no more roots. If the white people leave us, to go over the mountains to California, as some people tell us, we must go over the mountains with them too, or else starve. If we cannot get wild game, we must take tame game, like cows or steers; the same as the white people would do if they had nothing to eat, and nothing to feed their wives and little ones with.

When we were shivering and starving, the soldiers were our best friends. They gave us their cast-off clothing, and they gave us rations. When I left the convent and went back among my people, it was funny to see the men and women dressed in soldiers' overcoats and pants. They thought it was the grandest kind of dress. Then the agent promised us provisions and clothes for the winter; but he lied. He knew he lied when he said it. That winter our children were shivering, while he was amassing money by selling the things which the government voted for us. Are we to be blamed for thinking that you care for us like the snake in the grass? When I carried the dispatches for the soldiers, they promised Sarah money. Did she ever get it? or did she get any thanks for doing this? None: nobody said "thank you" to poor Sarah. I was greatly deceived when I came to San Francisco to get money and help for my starving people. I thought my own people would help. I call the Methodists my own people. They preached and they prayed, but they did nothing else for my poor, hungry, shivering people. I know some-

thing about sermons myself, and can preach a better sermon than any of their ministers. The soldiers are much better than the ministers. The Indian is like my white brother, Emperor Norton: he likes epaulets.

Once the Indians possessed all this beautiful country; now they have none. Then they lived happily and prayed to the Great Spirit. But the white man came, with his cursed whisky and selfishness and greed, and drove out the poor Indian, because he was more numerous and better armed and knew more knowledge. I see very well that all my race will die out. In a few short years there will be none left - no, not one Indian in the whole of America. I dare say the white man is better in some respects; but he is a bigger rascal, too. He steals and lies more than an Indian does. I hope some other race will come and drive him out, and kill him, like he has done to us. Then I will say the Great Spirit is just, and that it is all right.

Notes

1. The exact location is not certain, but it is very probable that Sarah is referring to the archaeological site known as NV-Ch-15 which lies at the spot where the Humboldt River empties into the Sink. The site is 4.5 miles east of Miriam siding on the railroad. By Carson Mountains she means the Humboldt Range.

2. From tsome (shell or shell bead) + tone (flower).

3. The piñon (Pinus monophylla) does not grow in the Humboldt Range; it is abundant in the Stillwater Range about 25 miles to the south, and it is here where the Humboldt Sink Indians went to secure them.

4. There is no evidence that the pinenut was a "principal food" in prehistoric times. This conclusion derives from the analysis of several hundred human coprolites from Lovelock Cave which is located 2.0 miles south of NV-Ch-15. See L. K. Napton, "The Lacustrine Subsistence Pattern in the Desert West." Kroeber Anthropological Society, Special Publ. No. 2, pp. 28-97, 1969).

5. The winter camp pattern is reported for other groups in Nevada by J. H. Steward, Basin-Plateau Aboriginal Sociopolitical Groups. Bur. Amer. Ethnol., Bull. 120, 1938. There is no evidence for or against a special winter camp pattern for the Humboldt Sink grup which numbered about 900. We believe that in pre-contact times the Humboldt Sink village was permanentl occupied except at times of high water due to heavy runoff in the spring.

6. An apparent reference to the Pyramid Lake War reported by Sarah Winnemucca, Life Among the Piutes, 1883.

7. Camas Prairie in southwestern Idaho. After the Paiute got horses they extended their range of travel and contact to Oregon and Idaho, hence the references to Camas Prairie, and camas and kouse roots which occur in Idaho and Oregon.

8. Side-okah (=Saidukah) is said here to mean "man-eaters". Sarah in her Life Among the Piutes states that this word (given there as saydocarah) means "conqueror" or "enemy". Loud, basing his identification on later Indian testimony, says sai-duka'a means "tule-eaters" and this version we believe is probably correct. It is, however, possible that the name comes from mudhen (saiya') or even bulrush (siavö).

9. Another, and similar, account of Lovelock Cave as the place where the sai-duka'a were killed off is in Sarah Winnemucca Hopkins' Life Among the Piutes (pp. 73-75).

10. Taken literally, this seems to indicate that the sai-duka'a lived up the Humboldt Valley from the Sink. I have already discussed the problem of the identification and original location of the sai-duka'a in a general commentary on papers presented at the Great Basin Anthropological Conference in 1964 (Desert Research Institute, University of Nevada, Technical Report Series S-H, Publ. No. 1, 1966-p.245).

11. This description is of fire-making with a palm drill. Archaeological specimens of drills and hearths confirm this as the ancient method.

12. The author means that the percussion method using flint to strike a spark was not used.

13. For a discussion of Paiute Chieftainship see R. F. Heizer, Notes on Some Paviotso Personalities and Material Culture. Nevada State Museum Anthropological Papers No. 2, 1960.

14. Northern Paiute shamanism is treated in detail by W. Park, "Paviotso Shamanism". American Anthropologist 36:98-113, 1934 and W. Park, Shamanism in Western North America. Northwestern Univ. Press, 1935 (Chap. II).

15. The medal, awarded for bravery in 1878, is shown in a photograph of Natches which appears in J. D. Forbes, Nevada Indians Speak. University of Nevada Press, 1967.

16. Polyandry among the Shoshoni and Northern Paiute is discussed by J. H. Stewart (Op. cit. in note 5, pp. 242-243).

17. I have not found this term recorded by ethnographers for the secondary wives. The word for wife is nodü-gwa.

18. The metate.

19. Chief Winnemucca's widow was killed by stoning in 1882. See R. F. Heizer, "Executions by Stoning Among the Sierra Miwok and Northern Paiute." Kroeber Anthropological Society Papers No 12, pp. 45-51, 1955.

Sarah Winnemucca Hopkins, photo taken ca. 1883

VIII. ADDITIONAL PROJECTILE POINTS AND LITHIC ARTIFACTS FROM LOVELOCK CAVE, NEVADA

C. W. Clewlow, Jr. and Lewis K. Napton

During the excavations at Lovelock Cave in Spring of 1969, salvage screening was conducted on the talus slope situated below the mouth of the cave. This slope is partially covered by a mantle of refuse consisting of screenings from the bat guano deposits which had been dug from the cave in 1911 by commercial guano miners. The debris had been partially investigated for archaeological specimens in 1965, and had produced classifiable projectile points (Clewlow 1968:89-101). These specimens were of unusual interest in that they represented cultural material from the destroyed upper depositional levels in the cave. The removal of these upper levels destroyed most of the evidence for the latest phase of occupation in Lovelock Cave.

The specimens found in 1965, particularly those which can be typed as Desert Side-notched and Cottonwood Triangular projectile points, which were in general use quite late in the Great Basin chronological sequence, strongly hinted that the cave had been occupied much later than was commonly supposed (Grosscup 1960:6). While the precise cultural affiliation of these Late Period cave inhabitants has yet to be definitely established, there is nonetheless a great deal of evidence to indicate that the discontinuity between archaeological information and ethnographic knowledge concerning the inhabitants of the Humboldt sink may be minimal, if such a discontinuity exists at all. This evidence has been summarized in recent papers by Napton (1969:52-56) and Heizer and Napton (in press).

The procedures used in the salvage-screening of the dump debris in 1965 and 1969 were essentially the same. The sliding mass of debris which lies on a slope with a gradient of approximately 35°, extends from the edge of the outer rockshelter of the cave to the base of the cave pediment. The deposits were removed in five-foot wide strips, working from the base of the slope toward the top. Halfway up the hillside, which is about 200 feet in length, the deposit was two or three feet deep and consisted of rock, fragments of burned bone, pieces of chert, occasional projectile points, shell beads, and other imperishable materials.

As Napton (1969:28-87) has pointed out, the perishable component of the dump debris all but disappeared following exposure to the open air for a period of only 58 years. The surviving organic material includes a few hulls of pinyon pine nuts (Pinus monophylla), which are rare in the cave midden and in the Lovelock Cave human coprolites. A few fragmentary coprolites found in the debris had been preserved as a result of having

charred. It is likely that some of the material had been burned in situ in the cave, but over the years relic hunters have doubtless set fire to the mass of vegetal material dumped on the hillside. L. L. Loud probably collected firewood from the dump during his stay at the cave in 1912. Loud examined the dump just three months after the material had been dug out of the cave. Loud (1929:29) states that "several thousand specimens were also obtained by working over the dump left by the guano crew." These specimens included examples of almost all types of artifacts found in the cave, as well as the bones of "at least 13 individuals" (Loud 1929:31).

The salvage screening of the dump debris in 1969 produced 33 classifiable points, which may be segregated into 9 distinct types. All but one of these types, Type H, has been recognized in previous collections from Lovelock Cave. Type names are those which have been utilized with success by researchers from the University of California for the past decade (Lanning 1963; Heizer and Baumhoff 1961; Heizer, Baumhoff and Clewlow 1968; Heizer and Clewlow 1968). It appears that these types are applicable to collections from other areas of the Basin (cf. Clewlow 1967; Clewlow, Heizer and Berger 1970), although the type collections are primarily from the western portion of Nevada and eastern California. Table 1 gives the dimensions of the points recovered in 1969. The specimens are shown in Plate 1.

Desert Side-notched (Pl. 1, a-b)

Two of these small points were recovered in 1969; both are of obsidian. They are diagnostic as a late time marker in both the Great Basin and California (Baumhoff and Byrne 1959).

Cottonwood Triangular (Pl. 1, c)

One obsidian specimen of this type was recovered in 1969.

Humboldt Concave Base A (Pl. 1, v, w).

Two obsidian specimens of this type were recovered in 1969.

Humboldt Concave Base B (Pl. 1, x-ff).

Nine of these points were found. Seven are of obsidian; two are of chert. It is sometimes difficult to distinguish this type from the Cottonwood Triangulars, which are shorter, less well made, and tend to have less concave bases. Several of the Humboldt Concave Base B points are badly worn, and their attribution to this category is tentative. It is possible that some of the wear results from abraison incurred during passage through the guano screening apparatus, or from contact with limestone fragments in the course of the gradual downhill creep of the entire mass of debris.

Rose Spring Corner-notched (Pl. 1, d-l).

Nine more of this type were recovered in 1969. Five are of chert, four of obsidian.

Eastgate Expanding Stem (Pl. 1, m-p).

Three of this type, all of chert, were recovered in the 1969 excavations.

Elko Eared (Pl. 1, q-s).

Three probable specimens of this type were recovered in 1969. Two are of chert, one of obsidian. The obsidian specimen is a poor example of the Elko Eared corner-notched point-type described by O'Connell (1967), and cannot be taken as representative.

Elko Corner-notched (Pl. 1, t, u).

Two probably examples of this type were recovered, both of which are made of obsidian. Both specimens are very dubious examples of the type, and have been classified tentatively.

Type H (Pl. 1, gg).

This large, well made point has been called a Type H point because its shape strongly resembles the type samples from site NV-Ch-15 on the Humboldt Lakebed (Heizer and Clewlow 1968:65). It has pronounced shoulders laterally offset 0.3 mm. at a ninety degree angle from the stem. The stem is slightly contracting; the base is poorly finished and slightly convex. Temporally, it is non-diagnostic. This specimen is made of obsidian. It is large enough to have served as a hafted knife; however, it exhibits no utility scars (see Hester, this volume).

Table 2 shows the number of points of each type which have been recovered from Lovelock Cave or the miners' dump. As may be seen, the 1965 work provided the greatest number of pieces. The specimens from 1969 add few new insights into the cave's prehistory. They do, however, substantiate the results of the 1965 investigations, namely, that a late occupation of the cave appears likely in view of the number of late point types that have been found there.

In addition to the classifiable points mentioned above, the 1969 screening produced eight fragments of points or blades, as well as a small amount of chert and obsidian debitage. Dimensions of the unclassifiable points are given in Table 3.

The lithic debris in the dump consists of cores, blades, primary flakes, and retouch flakes of cryptocrystalline materials (63:1401). There were many recognizable artifacts including a well made tubular pipe (63:1404) and several of the so-called "fish knives" (15:297) commonly found on the Humboldt Lakebed site (NV-Ch-15) and at NV-Pe-5 (Elsasser 1958). We mention the occurrence of this type of lithic material, heretofore unrecorded for Lovelock Cave, because of its usefulness in providing further evidence of the fact that the cave was used occasionally as an occupation site, contrary to the widely-held belief that the site was only a "cache cave."

(This matter is reviewed by Napton [1969:28-97] who describes additional evidence attesting to the recent domestic use of the cave chamber.) We have not completed detailed study of the lithic debitage from the cave.[2] Analysis of this material will probably provide information relevant to the extent of prehistoric trade patterns, or to the areal extent of territory traversed by the Lovelock populations. (See Weaver and Stross 1965:89-93.)

Another type of lithic specimen found in the dump is the flat-bed metate, of which three examples were collected in 1969. Loud found two milling implements on the surface of the dump:

> One was moss-covered and must have lain on the hillside many years. The other had bat guano adhering to one side and doubtless had been brought from the cave by the guano crew. The two are of coarse vesicular basalt and of the usual V-type found in Humboldt valley.... (Loud 1929:106).

Summary

Salvage screening of part of the debris from the Lovelock Cave "guano miners' dump" has produced numerous examples of Desert Side-notched, Cottonwood Triangular, and Rose Spring Corner-notched projectile point types, the presence of which indicates use of the cave during the protohistoric period in western Nevada. Lithic debitage, milling implements, and other utilitarian artifacts give evidence of domestic use of the cave.

Notes

[1] Many famous cave sites (e.g. Wilson Butte in Idaho, and Danger Cave in Utah) contain projectile points, but apparently lack significant amounts of lithic debitage (see Gruhn 1961; Jennings 1957).

[2] One of us (Napton 1969:28-97) has earlier pointed out the interesting situation presented by the archaeology of Lovelock Cave. The known collections of artifacts from this site made over the years include over 100 projectile points, but scarcely a dozen milling implements. However, almost all of the 350 Lovelock coprolites that have been analyzed contain quantities of seeds, mostly bulrush (Scirpus sp.) and other species of aquatic vegetation. If the archaeology of Lovelock Cave had been exposed to moisture (as it would inevitably be, were it an open-air occupation site) one might assume, on the basis of the lithic assemblage, that the inhabitants of the site had subsisted by means of hunting and limited seed-gathering, rather than by use of vegetal and lacustrine resources. The latter mode, of course, is demonstrated by analysis of the human coprolites preserved in the dry cave (see Napton and Heizer 1970).

TABLE I. PROJECTILE POINTS RECOVERED FROM LOVELOCK CAVE

Type	Previous*	1965	1969	Total
Desert Side-notched		4	2	6
Cottonwood Triangular		4	1	5
Humboldt Concave Base A	1	4	2	7
Humboldt Concave Base B	2	10	9	21
Humboldt Basal-notched	1	1		2
Pinto Shoulderless		2		2
Pinto Square Shoulder	2	1		3
Rose Spring Corner-notched	3	26	9	38
Rose Spring Contracting Stem		2		2
Eastgate Split Stem		2		2
Eastgate Expanding Stem		7	4	11
Elko Eared	10	3	3	16
Elko Corner-notched	2	2	2	6
Type H			1	1
Type J	___	2	___	2
Totals	21	70	33	124

* Data for this column based on Lowie Museum collections formed 1911-12.

TABLE II. DIMENSIONS, MATERIALS, AND LOWIE MUSEUM ACCESSION NUMBERS OF LOVELOCK CAVE POINTS

Type	UCMA	Length (cm)	Width (cm)	Thickness (cm)	Weight (gr)	Material
Desert Side-notched	2-47970	2.4	1.2	0.3	0.6	Obsidian
	2-47940	2.1	1.3	0.3	0.7	Obsidian
Cottonwood Triangular	2-47948	2.2	1.3	0.4	1.0	Obsidian
Rose Spring Corner-notched	2-47971	3.2	2.0	0.7	2.4	Chert
	2-47968	1.9	1.2	0.4	0.9	Chert
	2-47958	1.7	1.7	0.6	1.3	Obsidian
	2-47954	2.8	1.8	0.6	2.1	Chert
	2-47945	3.6	1.9	0.5	2.0	Obsidian
	2-47934	2.3	1.3	0.5	0.9	Chert
	2-41935	3.1	1.5	0.5	1.4	Chert
	2-47938	3.2	2.2	0.4	2.1	Obsidian
	2-47939	2.9	2.3	0.5	1.9	Obsidian
Eastgate Expanding Stem	2-47966	2.9	1.8	0.3	1.05	Chert
	2-47967	3.1	2.0	0.4	1.3	Chert
	2-47969	3.3	2.1	0.3	1.5	Chert
	2-47943	3.3	2.2	0.3	1.6	Obsidian
Elko Eared	2-47962	4.0	2.4	0.6	4.4	Obsidian
	2-47964	2.1	2.4	0.7	2.8	Obsidian
	2-47965	4.9	2.5	0.6	6.9	Chert
Elko Corner-notched	2-47944	4.2	2.0	0.6	3.4	Obsidian
	2-47937	4.1	2.6	0.8	8.2	Obsidian
Humboldt Concave Base A	2-47955	5.5	1.4	0.7	4.0	Obsidian
	2-47941	3.8	1.6	0.7	3.7	Obsidian
Humboldt Concave Base B	2-47964	3.0	1.2	0.6	1.7	Chert
	2-47957	3.0	1.5	0.5	1.7	Chalcedony
	2-47953	3.8	1.3	0.7	2.3	Obsidian
	2-47952	4.3	1.3	0.6	2.4	Obsidian
	2-47951	2.8	1.3	0.7	1.9	Obsidian
	2-47950	2.8	1.4	0.5	1.4	Obsidian
	2-47949	3.3	1.3	0.6	2.1	Obsidian
	2-47947	3.0	1.3	0.5	1.5	Obsidian
	2-47946	2.9	1.2	0.7	1.9	Obsidian
Type H	2-47936	7.6	3.1	0.9	17.7	Obsidian

TABLE III. DIMENSIONS OF UNCLASSIFIABLE POINTS FROM LOVELOCK CAVE

2-47986	4.0	2.4	0.7	6.5	Chert
2-47987	4.0	2.8	0.8	6.6	Chert
2-47961	1.7	1.9	0.5	1.4	Chert
2-47960	2.6	1.3	0.4	1.2	Chert
2-47959	2.4	1.4	0.4	1.2	Obsidian
2-47956	5.2	1.8	0.6	4.6	Obsidian
2-47942	3.9	1.4	0.5	1.6	Obsidian
2-47933	3.5	2.2	0.9	5.0	Obsidian

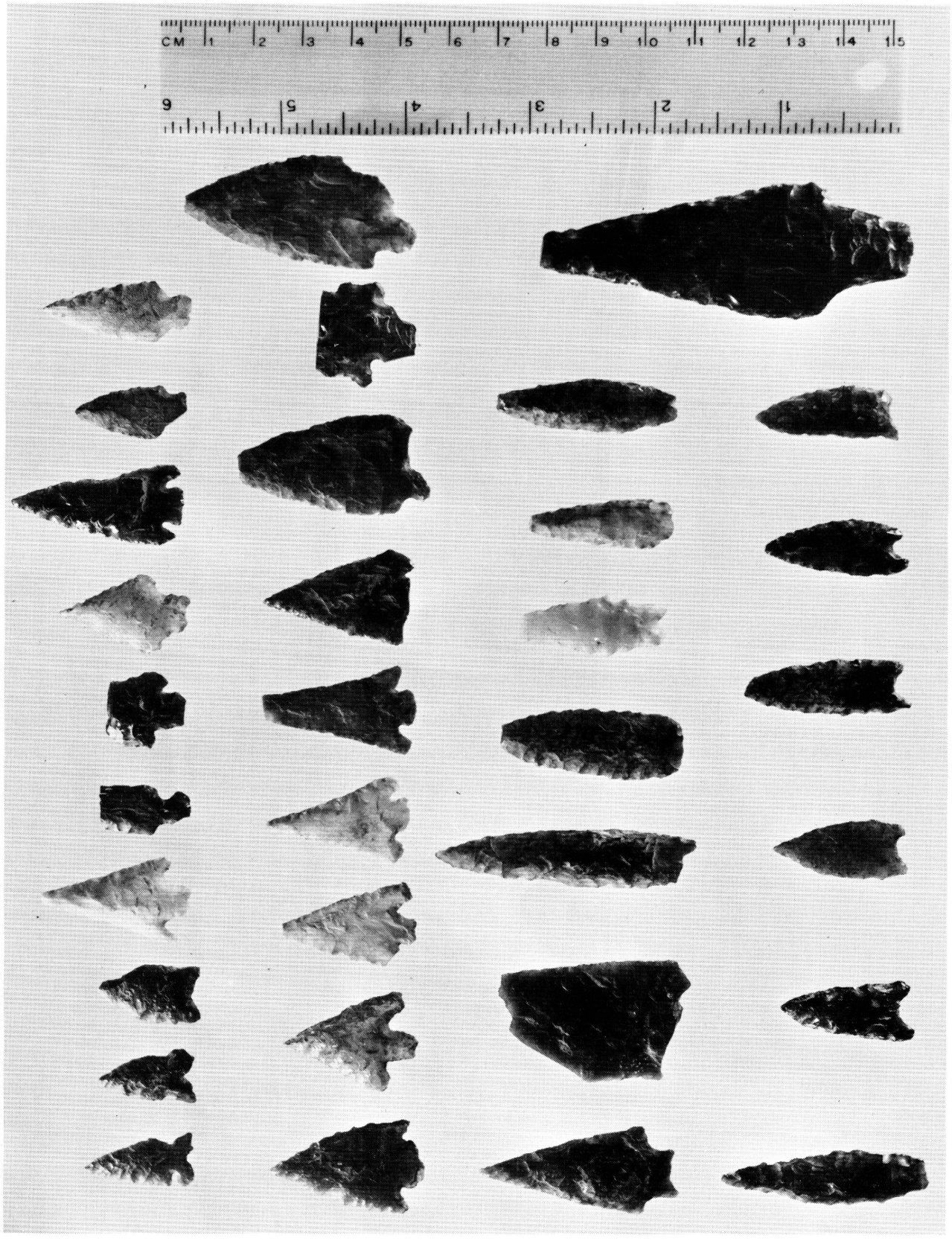

Plate I: Projectile points from Lovelock Cave, Nevada (NV-Ch-18)

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IX. A BASKET MAKER'S WORK KIT FROM LOVELOCK CAVE, NEVADA

Richard D. Ambro

In September, 1968, a University of California, Berkeley, archaeological field party under the direction of Professor Robert F. Heizer and Lewis K. Napton conducted limited excavations in Lovelock Cave, Nevada (NV-Ch-18). In the course of work in the hitherto unexcavated "west alcove" area, which is an extension of the outer rockshelter of the cave, an unusual bundle or parcel was found in grid unit S15/W100 at a depth of 36 inches in the dust and sand against the overhanging back wall of the alcove.

The bundle consisted of two main elements; an outer cover made of bird-skin, and an inner folded pouch of animal skin. Upon examination in the Museum of Vertebrate Zoology, University of California, Berkeley, the bird pelt (UCLMA 045092) was identified as the breast of a Canada goose (Branta canadensis)(Ned Johnson, personal communication, 1969). It was folded, forming a pouch which contained a smaller bundle made of an animal pelt (UCLMA 045093) identified as Vulpes regalis (Charles L. Douglas, personal communication, 1969).

The fox pelt contained a most interesting assortment of artifacts, including two bone awls, an awl blank, a coil of willow splints, and a small flake of chert. These artifacts are the work-kit of a Lovelock Cave basketmaker. The contents of the kit are described as follows.

One of the awls (UCLMA 045094) is 13.5 cm. long, 1.4 cm. wide, and was manufactured from the shaft and distal end of what may be an antelope or deer metapodial. The bone had been split by deepening the natural groove in the shaft, and the intercondylar fossa provides good purchase for wedging the bone apart. The rounded condyle provides an excellent butt end for the awl, which seats comfortably in the palm of the hand. The lateral edges of the awl still bear the striations produced in cutting the groove, as well as faint longitudinal striations perhaps resulting from the defleshing of bone prior to modification. The last 2.1 cm. of the tip of this awl is tapered to a point and finished by means of grinding on a stone surface. The butt was also ground to remove the sharp and irregular portions of the articular end. The tip and the butt, and, to a lesser degree, the shaft of the awl, exhibit a smooth surface and high polish from the final finishing of the piece and wear resulting from long and intensive use. The extreme apex of the awl bears faint, but unmistakable circumferential striations which resulted from rotating the awl tip to enlarge the aperture in manufacturing a coiled basket. This wear, imparted during use, has obliterated the grinding striations on this portion of the awl's tip.

Awls of split mammal bone enjoy a long and widespread popularity in the Humboldt Valley area and the Great Basin in general, into historic times (Heizer and Krieger 1956:18, pl. 10 i-l; Jennings 1957: 199-200, fig. 181 g, 193-194, fig 176 f; Loud and Harrington 1929:36, 149, pl. 66a-c, e-g; Steward 1941:288; Stewart 1941:382-83, 1942:264).

The second awl (UCLMA 045095) and the awl blank (UCLMA 045096) are of unusual interest, in that they are part of the same bone. They were made from a portion of the shaft and distal end of the bone of a pelican (Pelecanus cf. erythrorhynchos) (O. Brunetti, personal communication, 1969). The bone was split by means of an irregular longitudinal groove. The flake employed in making the groove apparently slipped frequently as the lateral edges bear scores of erratic and intersecting scratches. Both the awl and the awl blank are 16.0 cm. long, 1.4 cm. wide and their irregular edges fit perfectly. Although the bone was apparently cleaned before modification, the articular ends of both pieces preserve dry strips of adhering tendon. Spots of greasy dirt also occur on both pieces. By means of a set of intersecting fractures at the tip, each of the two halves were made to taper abruptly. No further modification is apparent on the blank, whereas the awl was completed by grinding the tip to a narrow point on a stone surface. In addition to the circumferential striations, a slight shoulder is present at the tip as a result of long use in making coiled basketry. This considerable wear obliterated the grinding striations and eventually so weakened the tip that the final 1-2.mm. of the tip snapped off. The butt end of the awl exhibits a high polish and the piece in general displays more signs of handling than does the unfinished blank. Generally speaking, this awl appears to have been intended for finer coiling than the other awl in the kit.

The birdbone awl and blank are especially interesting in light of their rarity in archaeological contexts and their apparent absence in the ethnographic literature (Steward 1942:265; Stewart 1941:288; 1942:382-83). Loud and Harrington report none from Lovelock Cave while Grosscup mentions one example without association (Grosscup 1960:21; Loud and Harrington 1929:37-38). An undated example was recovered from the nearby Humboldt Lakebed site (NV-Ch-15) in 1969 by a University of California field party. Two were recovered from Humboldt cave, one of which is of split birdbone and comes from a depth of 36-42" (Heizer and Krieger 1956:19, pl. 10h). Five other awls described as being made of whole bird or rodent bone come from D-V of Danger Cave (Jennings 1957:200). As the awl from the Lovelock cave kit and the other examples do not have points any finer than many mammal bone awls, their rarity must reflect a preference for stronger and more durable awls of mammal bone. Why any were made at all and why two examples would occur in a single instance, in the case of the basketry kit in question, is a mystery.

The flake, or more properly the blade (UCLMA 045097), which accompanied the awls is varigated tan and reddish chert, triangular in transverse section and measures 3.5 cm. in length and 2.0 cm. in width. The maximum thickness

is 1.0 cm. The proximal end of the blade displays a large bulb of percussion and retains the striking platform. The dorsal surface bears two intersecting flake or blade scars indicating the controlled striking of several such blades from the core. The distal end bears a very steep scraping edge, and one lateral edge of the blade exhibits traces of use. It is probable that the flake was employed in preparing basketry material like the bundle of splints found in the kit and was therefore kept with the other basketry implements.

The basketry kit included a bundle of prepared splints or coiling wefts (UCLMA 045098). This material consists of approximately fifty elements coiled together to produce an oval bundle measuring 13.0 X 9.5 cm. The splints range ca. 45.0-55.0 cm. in length. Each has been split, scraped, and trimmed so that most are approximately 1.5-1.8 mm. in width. Although they have been well scraped, occasional remnants of the bark and their general appearance indicates that they were derived from the shoots or roots of the willow (Salix sp.). (Wheat [1969] provides an excellent series of photographs illustrating the preparation of willow construction materials used in making baskets.) Their short length and their association with awls indicate their intended use in coiled basketry. Coiled basketry has a long tradition in the Humboldt Valley and elsewhere in the Great Basin and willow is a basic material (Heizer and Krieger 1956:45; Loud and Harrington 1929:65; Roust 1966:62-65; Stewart 1941:386).

Aboriginal life everywhere necessitated the occasional caching of possessions and raw materials in caves. There is abundant evidence of such practices in Lovelock Cave, Humboldt Cave, and numerous other sites in the Great Basin. Caches were often made in carefully prepared basketry-lined pits or in special containers such as skin bags or rush wallets. Bundles made of tule mats, animal skin, cloth, or burlap were also employed (see Heizer and Krieger 1956:91-101; Loud and Harrington 1929:9-11; Tuohy 1967: 4-5).

Among the contents of such caches there are bundles of raw materials (feathers, for example) but most of these materials were probably not used in basketry (see Heizer and Krieger 1956:91, 94, 96, 96, pl. 6b and d, pl. 7a; Loud and Harrington 1929: pl. 21 e, h. f; 43 q). Cache pit No. 29 in Humboldt Cave (NV-Ch-35) contained a mass of willow coiling splints. A bundle of peeled willow twigs was also recovered from the cave (Heizer and Krieger 1956:53).

The closest parallel to the Lovelock Cavebasketry kit was found in Death Valley (Wallace 1954:216-221). This cache, which dates to the historic period, was stored in a box, and contained six bundles of prepared splints which were coiled and tied like the bundle from Lovelock Cave. Also included in the cache was a piece of cowhide and a cup for soaking the materials prior to use. Wallace (ibid:219) suggests that the cowhide probably provided a

clean work surface. Perhaps the pelt and birdskin wrapping of the Lovelock kit served this purpose as well.

The lack of stratigraphic and artifactual association makes it difficult to date the Lovelock Cave basketry kit. It must be older than the seeds found in the upper layers of west alcove unit S10/W95 at a depth of seven inches, which gave a radiocarbon date of A.D. 1430 ± 95 (I-4672)(Buckley, personal communication to L. Napton, 1970).

Mammal bone awls are far too common and birdbone awls much to rare to permit dating the kit by comparative means (see Grosscup 1960:21). However, the fact that neither of the pelts containing the kit have suffered significant insect damage, the effects of which are clearly visible on many similar items found in the cave, suggests that the kit may be of a late date.

Of interest is the fine preparation and width of the splints in the bundle, when they are compared to the vast majority of coiled basketry fragments recovered from the Humboldt Valley caves. Their dimensions and uniform appearance approach those of splints employed in a small number of extremely fine basket fragments that are believed to have been acquired as trade items from the Washo Indians located to the west of the Humboldt Valley (Baumhoff and Heizer 1958). It is a pity that a sample of basketry employing some of the splints from the kit was not included by the basketmaker, for much of the identification of outland traded basketry depends on details of technique and decoration (ibid:53-56). The Lovelock Cave basketry kit suggests that some fine basketry was made in the Humboldt Valley. Perhaps centuries of trade might have occasionally stimulated a particularly skilled basketmaker to attempt to approach the standards of the costly trade pieces (ibid:31; Roust 1966:65). We are in need of a thorough restudy of the cave basketry fragments and examples of the basketry of the Washo and their neighbors, focusing on technological and decorative features, in order to distinguish between trade pieces and the locally-made copies that they apparently inspired.

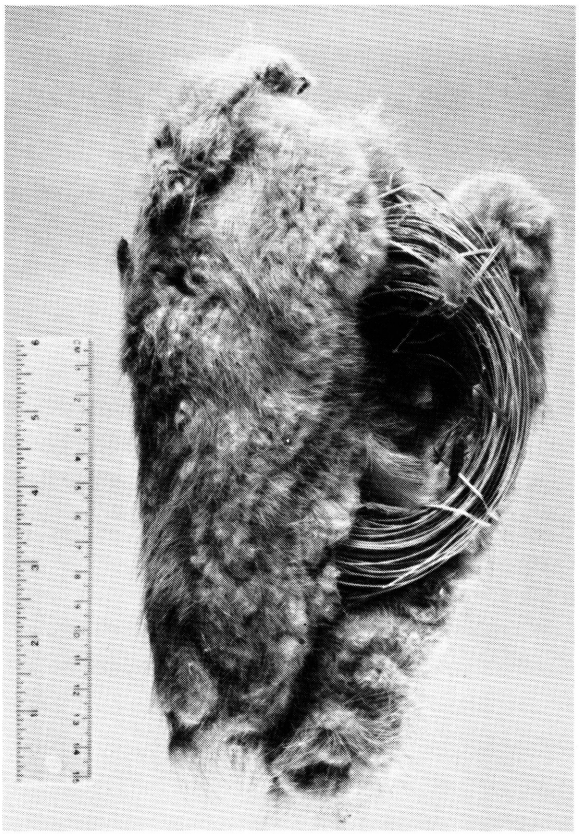
Explanation of Illustrations

1-a Photograph of basketry bundle from Lovelock Cave with birdskin pelt removed.

1-b Photgraph of open bundle with contents laid out. Fox pelt with bundle of coiling elements to left. At right is the unmodified bone fragment; the bird bone awl; mammal bone awl; and chert flake.

1-c Close up of bundle of prepared coiling elements and the tip of the mammal bone awl.

1-d Close up of chert flake and tip of bird bone awl.



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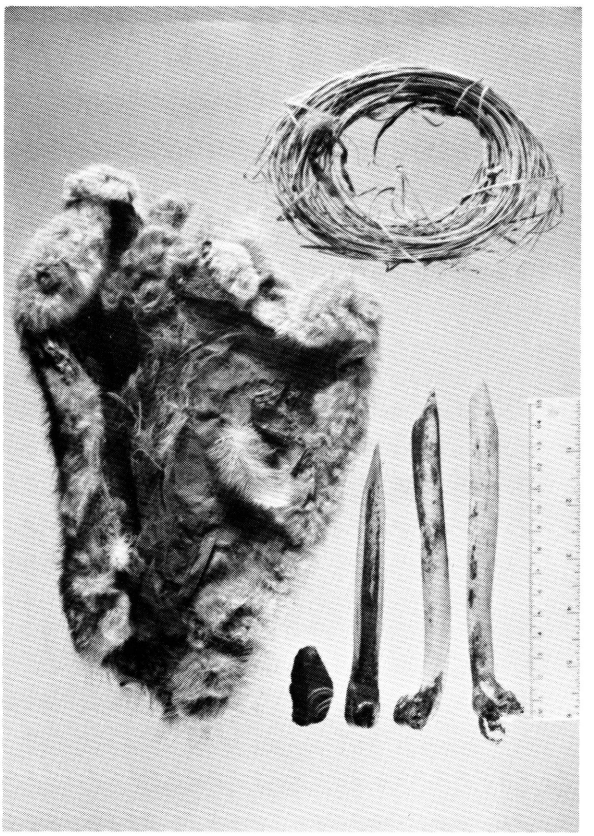

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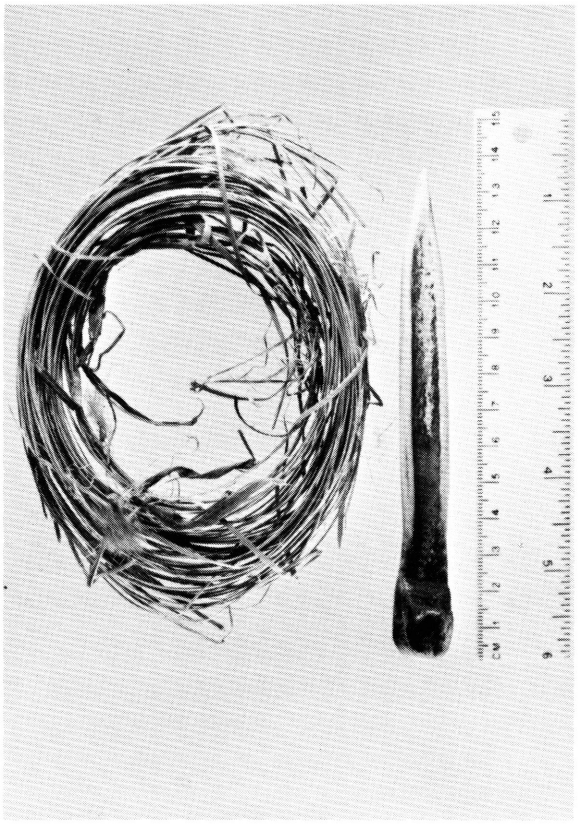

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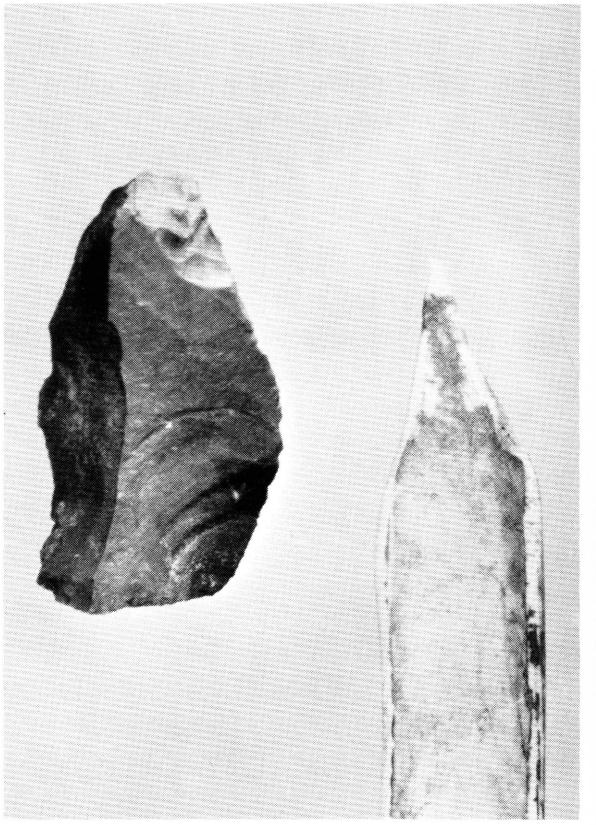

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Plate 1

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