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

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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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