WYOMING
ARCHAEOLOGICAL
SOCIETY

THE WYOMING ARCHAEOLOGIST

DEC. ISSUE, 1967

VOL. X NO. 4

The WYOMING ARCHAEOLOGIST is published quarterly by the Wyoming State Archaeological Society, Grant H. Willson, Editor. Address manuscripts and news items for publication to: The Editor, 1915 East 15th Street, Cheyenne, Wyoming 82001.

Individual Active Membership	$3.50
Associate Membership, inactive	3.00
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NOTE: Membership period is from January through December and includes all issues published during current year regardless of the month the subscription commences. All subscriptions expire with the Winter issue and renewals are due the first of January each year.

NOTE: Subscriptions, renewals, and all checks should be addressed to: Mrs. Mary Garling, Treasurer, 1500 Garden Creek Road., Casper, Wyoming 82601. Correspondence and orders for back issues should be addressed to: Louis C. Steege, P. O. Box 122, Cheyenne, Wyoming 82001.

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APPENDIX

DECEMBER ISSUE CONTENTS

Editor's Comment

I wish to acknowledge the very kind and thoughtful letter of congratulation upon the establishment of a state archaeologist extended by the Director of the Arkansas Archaeological Survey, Dr. Charles R. McGimsey. Included with his letter was the April, 1967; Number 28, copy of Field Notes, the monthly newsletter of the Arkansas Archaeological Society as well as Act 82 of 1959, Act 39 of 1967, and Act 58 of 1967, of the Arkansas Legislature. This issue of Field Notes signaled the crowning effort of ten years of hard work when the State Legislature finally recognized the value of archaeological resources by budgeting $112,500 for the first year's operation of Arkansas Archaeological Survey.

Each step in this ten year struggle for archaeological recognition is clearly documented in the Field Notes, and the experiences detailed exactly parallels our own. I am sure it would be extremely valuable for all of us to study this very successful example set by Arkansas so, with permission of Dr. McGimsey, copies will be made available to each chapter for further discussion at the April state meeting.

Our thanks to Ted Weber for his continuing valuable contributions while he is so busy working on that additional degree at Colorado University.

Coming next issue is a very interesting article on the Spanish Diggings.

LETTER FROM THE STATE ARCHAEOLOGIST

The purpose of the Wyoming Archaeological Society as stated in its constitution and by-laws are in accordance with the aims of the disciplinary study of anthropology of which archaeology is a part and it is felt that the best results toward this end can be obtained only by close cooperation of both State Archaeologist and the Wyoming Archaeological Society.

The Wyoming Archaeological Society is in a position where it can perform an important service to Wyoming archaeology in the future as in the past. It is largely through this organization that an intensive archaeological survey of the State of Wyoming can be carried out and a central file of the results compiled may very well serve as a framework within which systematic approaches toward Wyoming archaeology may proceed.

It has been satisfactorily demonstrated that members of the Wyoming Archaeological Society can be trained to a point where they can perform an acceptable archaeological excavation with a minimum of direction from the trained anthropologist. From this, it is not unreasonable to expect that the combined efforts of the Wyoming Archaeological Society and the State Archaeologist can produce significant contributions to a much-neglected void in American Archaeology.

With these ideas in mind, the State Archaeologist welcomes any proposals for future work. It would be appreciated also if each chapter would submit a priority list of archaeological sites that each feels should be investigated. Considerations for priority might be:

1. the immediate danger of destruction present

2. the apparent importance with regard to Plains' prehistory

3. the nature of the site with regard to feasibility of a local chapter being able to complete the project within a reasonable time period.

If any chapter of the Wyoming Archaeological Society is seriously considering a summer field season, the State Archaeologist wishes to express a desire to aid in any way possible within the limits of present facilities. There is no apparent reason why several projects should not be accomplished during the coming year that will fulfill some of the goals expressed in stated purposes of the Wyoming Archaeological Society.

Sincerely,

George C. Frison
Acting Head of
Department of Anthropology and
State Archaeologist

November 27, 1967

CAMPBELL COUNTY PROJECTILE POINTS

The following are eight accidental surface finds from the area southwest of Gillette, Wyoming:

1. White chert point with retouch flaking suggesting a resharpened broken point. Some grinding on stem. Found in 1948 by L. C. Barlow at the head of Kingsbury Creek. (Scottsbluff type)

2. Pink quartzite point with heavily ground stem. Found in 1950 by William Barlow on South Deadhorse Creek.

3. Red jasper point beveled to a "twist". Very blunted tip and leading edges. Found in 1950 by William Barlow on South Deadhorse Creek.

4. Red siltstone point, roughly made. Found in 1955 by William Barlow on South Deadhorse Creek.

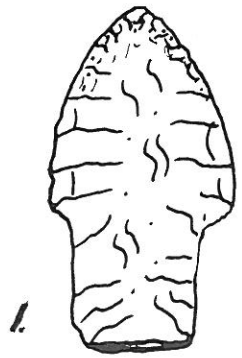
5. White quartzite point with some grinding of edges near base. Found in 1963 by William Barlow on North Deadhorse Creek. (Agate Basin type)

6. Tan jasper point with broad, shallow flaking. Edges near base indicate a certain amount of grinding. Found about 1939 by Paul Schmitt one-half mile west of 21-Butte. (Hell Gap type)

7. Tan chert point found by Bob Geer in 1957, along the Clarkelen Road fence, 2 miles south of Wildhorse Creek. This point may be seen in an artifact display at Pioneer Manor retirement home in Gillette.

8. Lavender jasper point, beautifully flaked and basally ground. Found about 1951 by Maynard High in alluvial gravel in the head of a small draw about 3 miles west of Gillette. This point is now mounted in the owners "trophy" belt buckle. (Similar to Ryor type)

William L. Barlow



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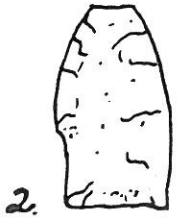

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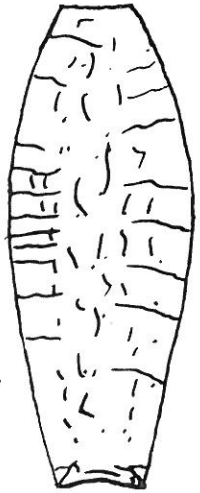

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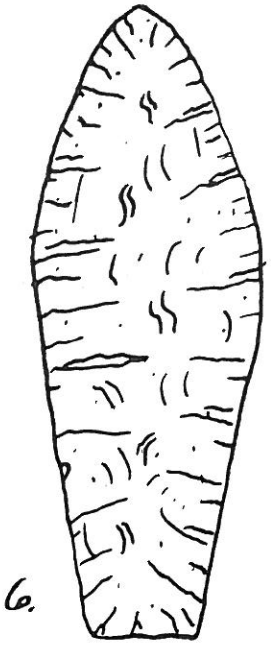

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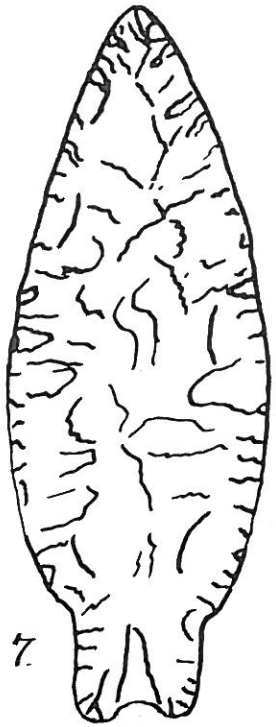

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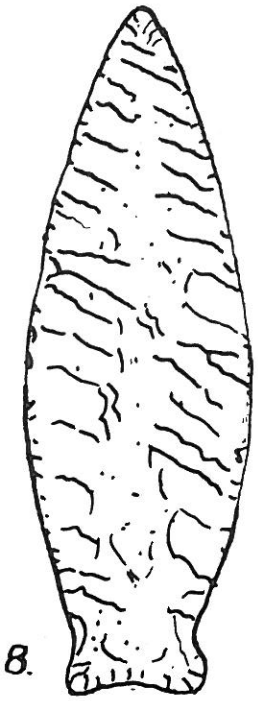

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GEORGE CATLIN: PIONEER ANTHROPOLOGIST
1796 - 1872

By Ted J. Weber

Even a cursory review of the life and works of George Catlin indicates he was something more than a mere pictorial recorder of a vanishing aboriginal way of life. Indeed, if we take the broad view of Kluckhohn (1944: 16-19) that an anthropologist is "....a person who is crazy to study his fellow man," Catlin emerges as such a man who indeed held up a large (and unique) mirror to let man look at himself in some of his infinite variety. In this regard then, it seems particularly anomalous to this writer that both Catlin's most consistent supporter (Ewers 1955, 1957, 1960, 1961) and also his most lavish expositor (McCracken 1959) should continue to confine him essentially to the role of Indian Painter. It is the purpose of this paper to review those broader aspects of Catlin's activities which, in this writer's view, entitle him to a larger position in anthropology than that discipline has traditionally accorded him.

Catlin's basic credentials as an artist, together with the more romantic aspects of his earlier wanderings, are generally known and need not particularly detain us here. However, key biographical data should be recalled if Catlin is to be viewed in a larger perspective. Although he was to abandon the practice after a brief period, Catlin was trained in the law. Historically, anthropology and law have been closely linked and there is no reason to believe that the comparative viewpoint, which is the essence of applied law, would affect Catlin any the less than it did Lewis Henry Morgan or than it does E. Adamson Hoebel. In his next phase, Catlin established himself as a portrait painter and although lacking formal training as an artist (though steeped in the subject matter since childhood) he was quickly admitted to the comradship of the leading artists of the day. His competence in this field is further evidenced by his election to both the Philadelphia Academy and The National Academy of Fine Arts by 1826 (a scant three years after abandoning the law), and by the clientele he was then serving. Included among the latter were the political and social luminaries of Albany, Washington and Richmond. For those who measure mastery by the dollar equivalent, Catlin had certainly succeeded in this second phase of his life. Then, with all conventional indicia of success assured, Catlin in 1829 abandoned his portrait painting and dedicated his life to making a pictorial and documentary record of the history and customs of the vanishing aborigines. We may consider the eight years he spent exploring and recording on the western plains (1832-1839) as the major period of this third phase of his life and it is this interval which we will explore in greater detail. Minutia of Catlin's life during all these phases are detailed in both Ewers (1955) and McCracken (1959) but as we arrive at a consideration of Catlin's contributions to anthropology we can fairly summarize his

"background" for an anthropological viewpoint by underscoring the following: an adequate academic background, historically demonstrated to be comparatively inclined; a superior ability to record the living image of man, as acknowledged by his contemporaries, professional and laymen alike; and, finally, a willingness to abandon all conventional indicia of success in the pursuit of an interest in his fellow man.

What then, are Catlin's contributions to anthropology? In the first instance, to say Catlin painted Indians is to say nothing...and yet everything. Catlin's effort was so prodigious and so effective that one is easily swayed to superlatives which do not help at all in any critical evaluation. Let us rather summarize what his biographers have found:

(1) Catlin was the first competent artist to paint the western Indians in their aboriginal state in a realistic manner. This effort helped to correct the two equally erroneous views of those times that pictured the Indian either as an idealized romantic figure or as a blood-thirsty savage (Hallowell 18-22; Ewers 1955: 494, 502).

(2) Catlin's output was not only fantastically prolific but his art was made almost immediately available to the metropolitan centers in America and Europe and the great bulk of it has survived in public centers available to scholar and layman alike. Thus, eighty percent of the 507 paintings listed in Catlin's Indian Gallery on its London opening in 1840 are preserved in the U. S. National Museum. Again one-third of the additional 100 paintings which he executed in Europe between 1840 and 1848 were also preserved there (Ewers 1955: 492-3). Finally, encyclopedic sources indicate another 400 Catlin sketches are in the possession of the American Museum of Natural History.

(3) While Catlin was not without his detractors in his own day (McCracken makes Schoolcraft a consistent antagonist) and particular criticisms of accuracy and/or truthfulness of selected paintings continue to be noted (Ewers 1955: 495-505 notes Catlin's failure to master the human body and points out such an obvious inconsistency in Catlin's work as Indians shown bison hunting in the snow, in summer war dress), still it is apparent that Catlin's basic effort was considered by his contemporaries to be essentially truthful and accurate (McCracken 16) and his work, whether copied, modified or plagiarized, has been drawn upon by hundreds of ethnologists and thousands of writers. When Clark Wissler wrote his Indians of the United States (1940), he freely acknowledged the Catlin ethnographic sources, both pictorial and literary. In more recent works, such as Driver's Indians of North America (1961), the anonymous cartoon is used to depict aboriginal clothing, shelter and

the like...but such works merely enhance Catlin as an obvious original source. Perhaps a measure of Catlin's true impact as a consistent source for a pictorial image of the American aborigine is reflected in a review of the glossy The American Heritage Book of Indians (1961) which while it does include first-time reproductions of exceptionally well executed Catlin water colors, compels Ewers (1961) to remark "...it is strange to see an Indian picture book without one of Catlin's views of a buffalo hunt on horseback."

But Catlin did more than merely show us the face and dress of "The One Horn, First Chief of the Sioux", woman's work in "Sioux Women Dressing Hides", and such rituals as the "Mandan Torture Ceremony". He kept a journal with voluminous notes explaining his pictures and describing the events they depicted. These form the basis for his major ethnographic work Letters and Notes on the Manner, Custom and Conditions of the North American Indians (2 volumes), first published 1841. His "Letter - No. 22" begins: "Oh, horrible visu - et mirabile dictu'. Thank God, it is over, that I have seen it, and am able to tell it to the world" (Letters: 1-155). Catlin then goes on to describe the ceremony of "O-Kee-Pa" and while Schoolcraft was to deny the accuracy of Catlin's explanation, Maximillian later vindicated Catlin (McCracken 206). Catlin's work goes on to elaborate much additional material dealing with all aspects of aboriginal Indian life. Whether the question relates to modes of killing buffalo (1-25), the slavish lives of Indian women (1-121) or disposition of the aged (1-216), Catlin has something useful for many of the important tribes in the area from the upper Missouri and Mississippi to the Mexican Territory. Even the quaint account of hypothetical Mandan origins (11-259) gives us insight into the thoughts of the day and is clearly distinguishable from Catlin's own first hand observations.

Catlin's second period of travel and recordation came after a sojourn of some 12 years in Europe where he had gone as an exhibitor after having been rebuffed at home in his endeavors to establish a national museum. Between 1853 and 1858 Catlin in company with a lone companion (a recently freed slave) explored and recorded in some of the most formidable country of South America - including the Matto Grosso area. McCracken (205) credits Catlin with visiting more of South America's primitive tribes than any other white man of record, before or since. As a direct consequence of these travels and subsequent wanderings in North America west of the Rockies, Catlin produced a distinct series of paintings the style of which is not generally known to the public and which is now identified as the Catlin Cartoon Collection (Ewers 1960: 911). The merit of these pictorial representations - which in the main consist of monotonous rows of generalized figures - together with the ethnographic worth of Catlin's other later literary efforts which were mainly directed to a youthful audience (Life Amongst the Indians 1857; Last Rambles Amongst the Indians of the Rocky Mountains and the Andes 1867) have been convincingly mitigated by Ewers (1960). Yet it is a

measure of Catlin's immense talent and total dedication to his chosen work that it was possible that two major biographical works on Catlin should appear in 1959, both profusely illustrated, each stressing a different period in Catlin's life, each using Catlin's own writings as a narrative background, yet with one work not duplicating the area of the other. The fact that Ross' George Catlin Episodes From Life Among the Indians and Last Rambles was not received as favorably as McCracken's George Catlin and the Old Frontier (see Book Review Digest 1961) seems quite incidental to an evaluation of Catlin himself.

Had Catlin done no more than has been detailed thus far he would be deserving of recognition beyond the designation "Indian Painter". Adequately equipped for the times, with great versatility and extraordinary drive and interest, he helped change a nations view of its aboriginal people and leaves us with an irreplaceable pictorial and literary source for an era which is not only gone but which was not otherwise as effectively recorded by any one man. But we must add, finally, consistent efforts by Catlin towards the establishment of a national museum. Though others are credited with the accomplishment, surely Catlin's persistence was a factor in the final fruition of this plan (McCracken 185).

Perhaps the more recent attitude of Mead and Bunzel(1960: 112-150) in recognizing Catlin as an anthropologist and deserving to rank with such other "dedicated amateurs" as Lewis Henry Morgan and George Bird Grinnell is a harbringer of a more sympathetic view to be accorded him in the future. This writer, for one, certainly hopes this is the case.

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SITE 48 SH 312: AN EARLY MIDDLE PERIOD BISON KILL IN THE POWDER RIVER BASIN OF WYOMING

By George C. Frison

ABSTRACT:

Site 48 SH 312 is apparently part of an Early Middle Period complex of which at least part of their economy was oriented toward small-scale trapping of bison utilizing the natural badland topography of the Powder River Basin. Further work is necessary to determine more of their economy as well as temporal and spatial aspects of this complex.

INTRODUCTION:

This report is the third in a series that deals with an apparently related complex of which little is as yet known. During the summer of 1961, the Sheridan Chapter of the Wyoming Archaeological Society excavated part of a bison kill in Powder River County, Montana, just over the Wyoming line (Fig. 1, Site 24 PR 5). The evidence of the kill was a layer of bison bone in the profile of an arroyo bank, covered by about two and one half feet of sterile clay. Artifacts consisted of a number of projectile points of a rather distinctive type and a few of what may have been butchering tools. A large skull from the site was described by C. Bertrand Schultz of the University of Nebraska as "an intermediate form between Bison bison and Bison antiquus," (Bentzen 1961). This identification was on the basis of a single specimen.

The following summer, 1962, the same organization excavated in a similar bison kill further south in Wyoming (Fig. 1, Site 48 SH 311). At this site the sterile overburden was nine feet in depth and again the layer of bison bone appeared in the profile of an arroyo bank. The same distinctive type of projectile point appeared with a few worked flakes that may represent butchering tools. No official identification of the species of bison involved was made but was thought by the investigators to be Bison bison (Bentzen 1962).

Radiocarbon dates from the two sites were rather widespread. The Montana site yielded a date of 2500 ± 125 years B. C. and the Wyoming site was 650 ± 200 years B. C. If correct, these dates suggest a rather long duration for this particular complex in the area. Both dates were from Isotopes Incorporated.

During the summer of 1966, the writer was asked by the Wyoming Archaeological Society to direct excavations in a similar bison kill along the Powder River and in

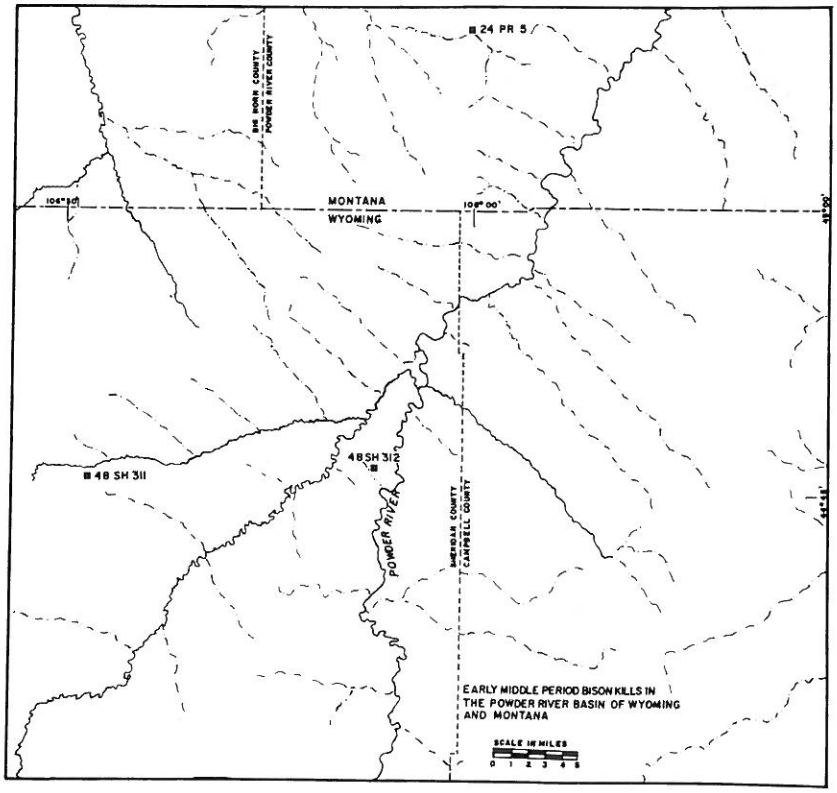
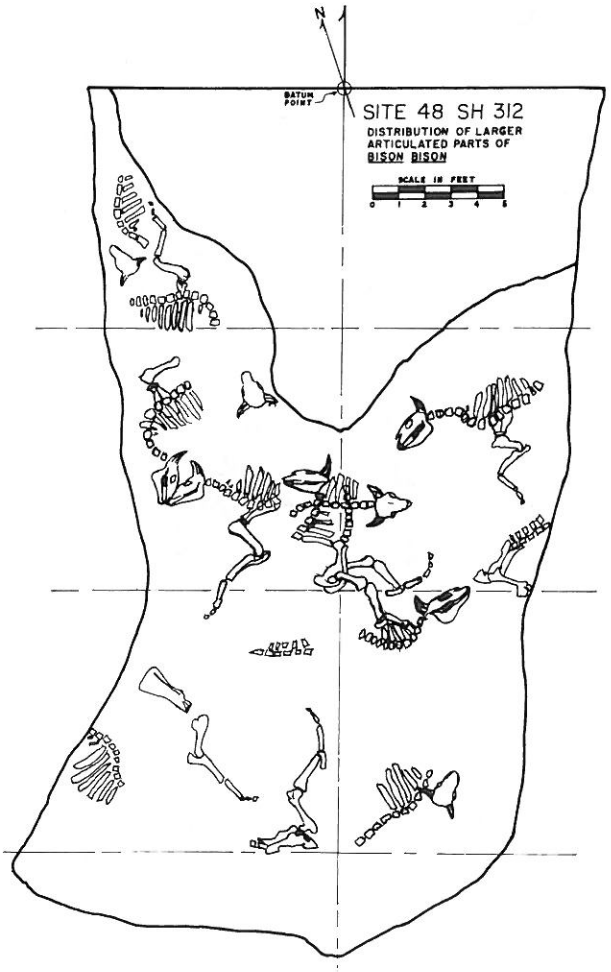


Figure 1

Figure 1-Location of archaeological site 48 SH 312 and other related bison kills in northeastern Wyoming and southeastern Montana.



the same general area as the other two sites mentioned above. The University of Illinois has their summer geology school in this area and Dr. John Mann, a geomorphologist of that institution expressed a keen interest in the site, and provided the geological report that follows the archaeological report.

The Powder River Basin is drained by the Powder River which is a slow, meandering stream that empties into the Yellowstone River further north in Montana. The Powder River Basin is a typical badland country with moderate erosional relief and the site area is highly dissected by arroyos that drain directly into Powder River a short distance away (Fig. 1, Site 48 SH 312). Elevation at the site is approximately 3850 feet and the area is known as the Quarter Circle Hills (44° 47' N Lat, 106° 07' W Long). Bison bone appeared in the profile of an arroyo bank about 25 feet from the bottom, and was covered by as much as 11 feet of sterile clay (Fig. 4 a). A contour map of the site area appears in the geological report immediately following. The nature of the site area and the overburden itself which was a very tough, hard gumbo clay ruled out the efficient use of power equipment that was available. Shovels and other hand tools were relatively ineffective and the problem was solved rather uniquely and successfully. One of the members of the Wyoming Archaeological Society was an expert with blasting powder and this individual was able to remove the sterile overburden to within a foot or so of the bone level without any damage whatsoever to the latter, and with a minimum cost in time and effort. Disposal of the dirt was no problem due to the location of the site above the bottom of the arroyo (Fig. 4 b).

Exposure of the bone level revealed part of the bottom of what was at one time a larger bison trap. Remaining were parts of at least 12 bison in various stages of articulation (Fig. 2 and Fig. 5 b). According to Dr. Paul McGrew, vertebrate paleontologist at the University of Wyoming, they are probably Bison bison. The animals were killed by placing projectile points in very effective locations, usually fairly high and forward in the rib cage and in two instances, in the vertebral column itself. The projectile points were relatively large and were probably dart points (Fig. 3). A total of 25 complete and broken projectile points were recovered of which 16 were found in rib cages or the vertebral column. One carcass contained four; three contained two; and six contained one. The projectile points vary from those which could almost be classified as stemmed (Fig. 3 k) to side-notched (Fig. 3 d) but a clustering occurs around a corner-notched type. Blade edges are usually convex although some are straight (Fig. 3 i) to concave (Fig. 3 h). Bases are concave (Fig. 3 f) to those with a definite base notch (Fig. 3 a, i). The projectile point sample is rather small for any meaningful statistical analysis although none of the attributes suggests multi-modal tendencies. Of the total number, 20 are metamorphosed shale, three are quartzite and two are of chert. Two (Fig. 3 p, q) suggest use other than as projectile and may have been used, perhaps secondarily, as butchering tools or in other contexts.

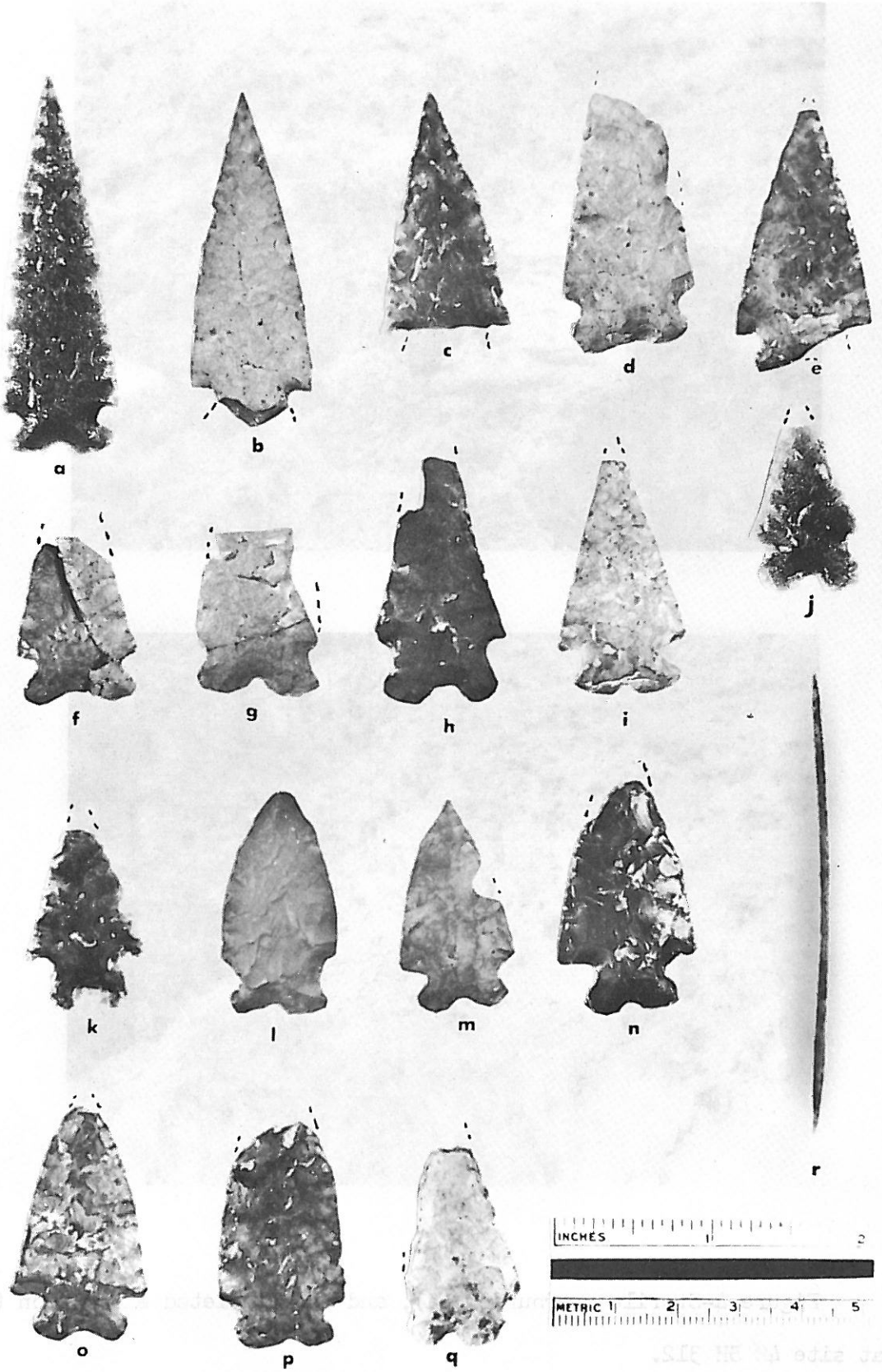


Figure 3-Projectile points (a-q), and bone needle (r) from site 48 SH 312.

Different soil conditions were present at the bone level allowing the use of conventional hand excavation tools. The condition and distribution of the bones leaves little evidence of any stylized butchering processes as is found in Late Prehistoric sites in the same area (Frison 1965). Instead, it would appear they were taking whatever was easiest to obtain from each carcass. Front quarters were especially ignored although the meat could have been stripped from the bones to a large extent before they were abandoned. Most rear portions of the carcasses were missing entirely, thus suggesting some preference for the hind quarters. Rib cages and the associated parts of vertebral columns and the forelegs resting directly on the ground were usually quite well preserved in a normal articulated position suggesting little in the way of disturbance after they were abandoned. Other disturbances of bones may have been partially due to predators. It is believed however, that the bones were covered a short time after the kill operation.

Brain cavities were intact on eight skulls which were preserved to an extent that such an observation could be made, and on five of these, the mandibles and hyoid bones were still in their original positions suggesting that the tongues were not especially desired items of food, contrary to Late Prehistoric Period hunters who considered the tongue a special delicacy. Four complete sets of articulated cardal vertebrae suggests they were not saving all of the hides or employed a skinning process whereby the tail was left with the carcass which seems unlikely. Very few of the larger bones that contained any significant amount of grease or marrow were broken which may reflect a disregard for this food source and was of considerable importance in later time periods, or else more animals were killed than were needed or could be properly taken care of.

Foetal bones and the bones of calves or very young animals were entirely lacking. These and other considerations still leave a question as to the time of year involved. The foetus could have been a desired food item as in Late Prehistoric times, and, if so, they were probably removed. Young calves, if present, could have been especially desired and removed to a different part of the site or a butchering area. As will be explained later, only part of the total site area remains and the presence or absence of certain bones or animals in certain age groups cannot be stated with any certainty.

Tools at the site were lacking with the exception of two projectile points, described above, that may have been butchering tools. The evidence at the site suggests that a certain amount of butchering activity must have occurred. Flakes recovered at the site offer evidence of butchering activity that appears reasonable within limits ot what might be expected. A total of 106 unworked flakes were recovered all of which were quite small (total wt. 29 grams). None appeared to be the result of tool manutacture but at least 47 were retouch flakes that were removed from tools in resharpening. All were trom tools that were

plano-convex in transverse cross section and may have been, what can best be described as, side scrapers. Retouch from at least seven tools were recovered and a soft hammer percussion technique is indicated by rather broad flakes with distinct overhangs remaining on the bulbar face (Fig. 5 a). The striking platforms are flat, none are faceted which suggests that they were part of the inner flake face of a tool such as a side scraper. Working edges of the retouch flakes demonstrate very small use flakes and sometimes a definite scalar retouch (Bordes 1961: 26) all suggesting hard usage.

One bone artifact was recovered from the site and this was bone needle (Fig. 3 r) ground from a sliver of unidentified bone. It was a sharp point on both ends and the entire surface has a polish that covers most of the grinding from manufacture.

GEOLOGICAL CONSIDERATIONS

A complete report on the geology of the site and the area follows this archaeological report, and only a few brief comments will be made here on the geological implications. In the first place, it was impossible to explain the location of the bison bones with respect to the present topography of the immediate site area. Obviously the explanation lies in making a reconstruction of the site area at the time of the actual bison kill. At this time, the bone level was the bottom of the arroyo and a few feet north of this in the headward direction was a perpendicular wall that formed as the result of headward erosion in alternating hard and soft strata. The sides of the arroyo were steep and this formed a natural trap estimated by the geologist, Dr. Mann, to have been about 35 meters wide. A small remnant of the trap was discovered on the side of the arroyo opposite the excavated area confirming Dr. Mann's independently arrived conclusions. Down the arroyo from the trap, the sides gradually became less steep until a point was reached where it was a simple matter to cross the arroyo and this was where the animals had to enter. This pattern of headward erosion in arroyo development is repeated continually over the entire Powder River Basin and in many instances offers these same favorable conditions for animal traps. It is of some interest to note that directly below the site today there is a smaller trap about 25 feet in width produced by a recent cycle of erosion that from all appearances would serve quite well as a bison trap.

After the animals were killed, there was a rapid deposition of debris over the remains and subsequent to this there was erosion that deepened the arroyo. This deepening action destroyed a major part of the original trap and left the remaining portion of the bison bone level high in the bank where it was recently found. No radiocarbon date from the site is yet available, but Dr. Mann (Geology of Archaeological Site 48 SH 312, Wyoming, this issue) suggests a date of 3500 to 4000 years before present or somewhere between 1500 and 2000 B. C.

which fits well within the range of radiocarbon dates of the sites excavated in 1961 and 1962.

CONCLUSIONS:

The evidence to date suggests that the site on the Powder River (48 SH 312) represents an Early Middle Period (Mulloy 1958: 208-9) bison kill that is part of a complex known to the Powder River Basin area of northern Wyoming and southeastern Montana. Further investigation may extend this complex to adjacent areas. This area has produced no evidence to date of occupation immediately preceeding the Early Middle Period or during the Altithermal period and the site may represent the first people to move back into the area after the Paleo-Indian hunters of which there is evidence at an earlier date at the Agate Basin Site (Roberts 1951), the Brewster Site (Agogino and Frankforter 1960), and other unreported locations.

How much the bison contributed to the economy of these people is as yet unknown. It is possible and quite likely that they may have depended on vegetable foods to a considerable extent especially at certain times of the year. There is as yet no evidence to prove or disprove that they may have been drying or in some other way preserving some of the meat from the bison for future use. The site area does produce surface evidence of what is believed to be an Early Middle Period manifestation and this is in the form of sandstone slab milling stones and manos. The bison hunting may have been nothing more than a single phase in the lives of people oriented at other times toward vegetable gathering or hunting of small animals much as the evidence at the nearby McKean site (Mulloy 1954: 440) suggests. One thing certain is that they were able to utilize the features offered by the natural topography of the country to trap bison and control the animals to the extent of killing them by placing projectile points in vital spots in the rib cage with remarkable regularity. The type of operation indicated undoubtedly dealt with small numbers of bison and was not to be compared with the later bison drives where large numbers were driven over cliffs or into pounds. This Early Middle Period type of operation would not require the amount of communal cooperation necessary for the drives executed during the later periods. It would appear that four or five males or an extended family group would have been able to carry out an operation as suggested by the Powder River site. It might be considered as an extension of individual or small group hunting where a small herd of animals could be stampeded into entering an arroyo where there was a shallow spot and a man or two on each side could hold some or all of the animals in the bottom until the arroyo sides became steep enough that it was impossible for them to get out. When the animals reached the perpendicular wall at the

end of the trap it would have been a simple matter to kill them. Successful traps were undoubtedly used again and again. It is difficult to conceive of any form of gate or plug for the downward opening considering the lack of timber in the area unless some sort of an obstacle possibly of hides sewn together was used. Wild animals are reluctant to push their way through an obstacle they are unable to see through. It would have been easy and effective for a man on each side of the arroyo to hold one end of such a contrivance and bring it along behind the animals as they headed up the arroyo toward the trap. The effectiveness of an obstacle such as this is usually quite good although it would not stop the animals if they were crowded or forced into it.

Still lacking is a good explanation of butchering and meathandling techniques. It would appear that one of the most important and as yet unknown quantities of this adaptation to the Powder River Basin at this time period concerns the purposes for which the bison were killed with respect to immediate or future needs. The evidence from 48 SH 312 which is admittedly very incomplete suggests killing the animals for immediate food needs with no background of stylized handling of this economic resource for needs projected into the future. Obviously if the entire bison trap remained, it might have been possible to extract more information of this nature. It is important to find a campsite or area where the meat was further handled after being killed. Comparison of bone remains in the two areas should give some information along these lines. There must have been a campsite close by as it is difficult to conceive of these people moving any large amount of meat long distances. They were probably small groups, and the campsites of a temporary nature depending upon the random movements of the bison. Under these circumstances, the campsites would most likely not appear as large concentrations of cultural material. Even if found in the profiles of arroyos, they would be more difficult to see than the bison bone level typical of a kill site. Much of this is speculative but the writer has reports of other similar bison kills in the area which may eventually produce the evidence for a more complete description of this complex.

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The following article is quoted from the ROCKY MOUNTAIN NEWS

SEARCH TO START FOR HUMAN RELICS - - SYDNEY, AUSTRALIA - -

Three archaeologists plan to lead a search in caves on the Nullarbor Plain for what they believe are traces of human life 18,000 years old.

The search is scheduled to start later this month at caves situated between Ceduna and the West Australian border.

Those leading the search will be the director of the South Australian Museum, W. P. Crowcroft; the curator of anthropology at the museum, R. S. Edwards; and a senior lecturer. D. E. symons. An excavation team of more than twenty men will be involved.

GEOLOGY OF ARCHAEOLOGICAL SITE 48 SH 312 WYOMING

By C. John Mann

ABSTRACT:

Archaeological Site 48 SH 312 occurs upon slightly weathered shale in the uppermost portion of the Fort Union Formation (Paleocene) of eastern Sheridan County, Wyoming. Only a trace of a paleosol is developed on the shale. Colluvium overlies the shale. The site is a small remnant of a ravine floor which existed during Kaycee time. Physiography of the present ravine and local distribution of resistant lenticular strata in the Fort Union Formation, suggest that the paleo-ravine was a box ravine with near vertical walls of 5-10 meters. Paleosol development, weathering features, and homogeneity of colluvium are interpreted as indicating a surface that represents late Kaycee time and provides a geological age for the site of 3500 to 4000 years before present.

INTRODUCTION:

Archaeological site 48 SH 312 is located in a small ravine in the Quarter Circle Hills about two kilometers west of the Powder River in eastern Sheridan County, Wyoming (NW 1/4, Sec. 3, T 55 N, R 77 W). The site is approximately 80 meters above the Powder River. The terrain of the area generally shows moderate dissection by semi-arid erosion of the flat lying, poorly consolidated Tertiary sediments. Maximum relief between river level and hilltops is about 200 meters.

STRATIGRAPHY:

A thin and poorly developed pedocalic soil overlies bedrock in the area. Numerous exposures of the slightly indurated sediments of the uppermost strata of the Fort Union Formation (Paleocene) are seen in the valley walls, ravines, and on the upland slopes. Excellent outcrops of the Fort Union occur along the Powder River. The higher hills both east and west of the Powder River are capped by the Wasatch Formation (Eocene).

The Fort Union Formation is composed predominately of non-marine, fine clastic material with a few intercalated brackish to marine limestones and shales. Shales, siltstones, and fine sandstones dominate; coal is common; and limestones are rare. The environment of deposition is interpreted as a low coastal plain region, near the strand line, with brackish waters common either as swamps or marshes. Recurrent invasions of the sea for sufficient periods permitted thin to

mediumly-thick beds of marine sediments to accumulate. Non-marine strata are characterized by lenticularity and thin to fissile bedding.

The 43 meters of the Fort Union Formation exposed near the site from the bottom of the ravine to the top of the adjacent divide (Fig. 1) is mainly silty shale. A fossiliferous marine limestone containing abundant gastropods and a few pelecypods occurs in the bottom of the ravine. Viviparus raynoldianus (Meek and Hayden) and Campeloma multistriatum (Meek and Hayden) are most common. Coal development in the immediate vicinity of the site is poor. Only thin subbituminous and peaty layers are found in black shale in the ravine. However, somewhat thicker lenses of coal and "clinker" beds, those red, cindery appearing, baked zones adjacent to coal seams which have spontaneously combusted and burned, are found in the ravines adjacent to the one in which the site occurs. Above the coal, several thin sandy layers occur. These are slightly more resistant than the shaly portions and tend to form poorly developed benches on the hill side. These benches clearly illustrate the lenticular nature of the sandstone beds. Their slightly greater resistance to erosion than the remaining strata result in a tendency for small, arroyo-like faces to develop in headward erosion of the Fort Union Formation. This apparently contributed significantly to the location of the site.

The site occurs on silty shale (Fig. 1) which has almost no paleosol developed beneath the bones. However, the shale does exhibit slight to moderate weathering as much as six feet beneath the site.

GEOMORPHOLOGY:

The central portion of the Powder River Basin, like other basinal areas in Wyoming, is characterized by generally moderate erosional relief in the essentially flat lying Tertiary sediments. The area is moderately to highly dissected by ravines and gullies. Arroyos are commonly developed in the alluvial areas. Although the ridges, divides, and hills are rounded in general, steep erosional faces are common and even small cliffs are developed locally. These steep faces may originate in either of two ways: 1.) by rapid headward and lateral fluvial erosion such as seen in arroyo development, or 2.) as a result of capping beds more resistant to erosion than underlying strata. Commonly, as in the area of this site, both are equally important and contribute jointly to terrain development. Numerous examples of both occur in the ravine in which the site is found.

Arroyo erosion has been related to climatic fluctuations occuring since the Pleistocene (Table I) by numerous workers. Where well developed,

terraces and associated features offer a satisfactory means of geologic dating.

PALEOGEOMORPHOLOGY AND AGE:

At the time of the bison kill the ravine (Fig. 2, dashed lines) was much less deep, but essentially flat bottomed with sides very steep to vertical and probably 5-10 meters or more in height (Fig. 3). It was undergoing slight erosion as indicated by the essential lack of paleosol and the weathered zone beneath the bones. The paleo-ravine resembled very closely an arroyo, but it was developed in poorly consolidated shale and sandstone and had a much greater width to height ratio than normally found in arroyos developed in alluvial material. Remnants of this paleo-ravine floor are found on the ravine wall down slope from the site. No remnants are found above the site. A thick lenticular sandstone at the level of the paleo-ravine floor and a thin but resistant limy sandstone approximately 8 meters above occur in the face of the ravine wall immediately above and adjacent to the site. The present ravine is much narrower and more noticeably incised from this point to its present head, about 700 feet north-northeast of the site, than down the ravine (Fig. 3). Thus, the paleo-ravine at the time of the bison kill appears not to have extended above the site, but terminated in a steep wall formed by more resistant lenticular strata in the Fort Union Formation. This wall still is partially evident adjacent to the site. Apparently, the site was at the upper end of a relatively broad (35 meters) but shallow (5-10 meters) box ravine (Fig. 2); it seems to have been an excellent natural trap for animals.

Colluvial material composed of slope wash debris with possibly some loess covered the kill site. The homogeneity of the material suggests continuous and rapid deposition, probably not long after the kill. Deposition of the colluvium was most likely an initial stage of the post-Kaycee erosional cycle which deepened the paleo-ravine rapidly without much lateral erosion. This deepening action together with the associated gully erosion did destroy a major portion of the original site.

The physiographic level upon which the site is formed is the ravine equivalent of the Kaycee Terrace developed adjacent to the Powder River, and other major streams in northeastern Wyoming. The material over-lying the site is believed to represent a late Kaycee or very early post-Kaycee deposit. Thus, the archaeological site is dated geologically, as late Kaycee most probably, but possibly as young as very early post-Kaycee time. This represents a period approximately 3500 to 4000 years before the present.

Evidence of younger erosional cycles occur in the ravine. Post-Moorcroft

(Table I) erosion is seen in the arroyo-like faces at the head of the ravine and also in numerous tributary gullies to the ravine. Post-Lightning (Table I) erosion, or modern erosion, may be recognized in the numerous, low (1 meter) arroyo-like faces in the present floor of the ravine, one of which is directly below the site.

SUMMARY:

The surface upon which Archaeological Site 48 SH 312 lies is a remnant of an old ravine floor that has been preserved by colluvial burial and subsequently, greater downward than lateral erosion by water. This paleo-ravine floor is equivalent to the Kaycee Terrance level that is well developed throughout northeastern Wyoming in major stream valleys. This correlation provides a geological date for the site of 3500 to 4000 years before the present.

Present topography of the ravine in which the site occurs; the areal distribution of the resistant, but lenticular sandstones and limestones in the Fort Union Formation; and the position of the colluvium and weathered portion of the bedrock shale indicate that the paleo-ravine at the time of the bison kill was a flat bottomed, broad box-ravine with near vertical walls 5 to 10 meters high. The ravine apparently terminated abruptly above the site. This box-ravine formed a natural trap into which animals could be driven and slaughtered by the Indians.

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TABLE I. REGIONAL CORRELATION OF ALLUVIAL TERRACE SEQUENCES

		I	II	III
GLACIAL CHRONOLOGY	ABSOLUTE AGE Years before present	WYOMING (Leopold and Miller, 1954)	WHITEWATER DRAW ARIZONA (Sayles and Antevs, 1941)	CHACO CANYON NEW MEXICO (Bryan, 1941)
	0			
NEOGLACIATION		Modern erosion	Modern arroyo	Modern erosion
	100	LIGHTNING FORMATION (deposition)	Upper Silts, pottery, (post 1300 A.D.)	Channel deposition pottery circa 1200 A.D.
	500	Erosion	Erosion after 1200 A.D.	Erosion
	1000	MOORCROFT FORMATION (deposition)	SAN PEDRO STAGE deposition (radiocarbon age of 2500 years)	Main fill pottery dated 500-700 A.D.
	3000	Erosion	Erosion	
	3500	KAYCEE FORMATION (modern fauna)	CHIRICAHUA STAGE modern fauna, (radiocarbon age of 4000 years)	
	5000			
ALTITHERMAL		Erosion, well developed paleosol	Erosion	Large arroyo
	7500			
WISCONSIN STAGE		UCROSS GRAVEL	SULPHUR SPRINGS STAGE Elephant, Equus, Camelops, hickory, (radiocarbon age of 7200-7800 years)	

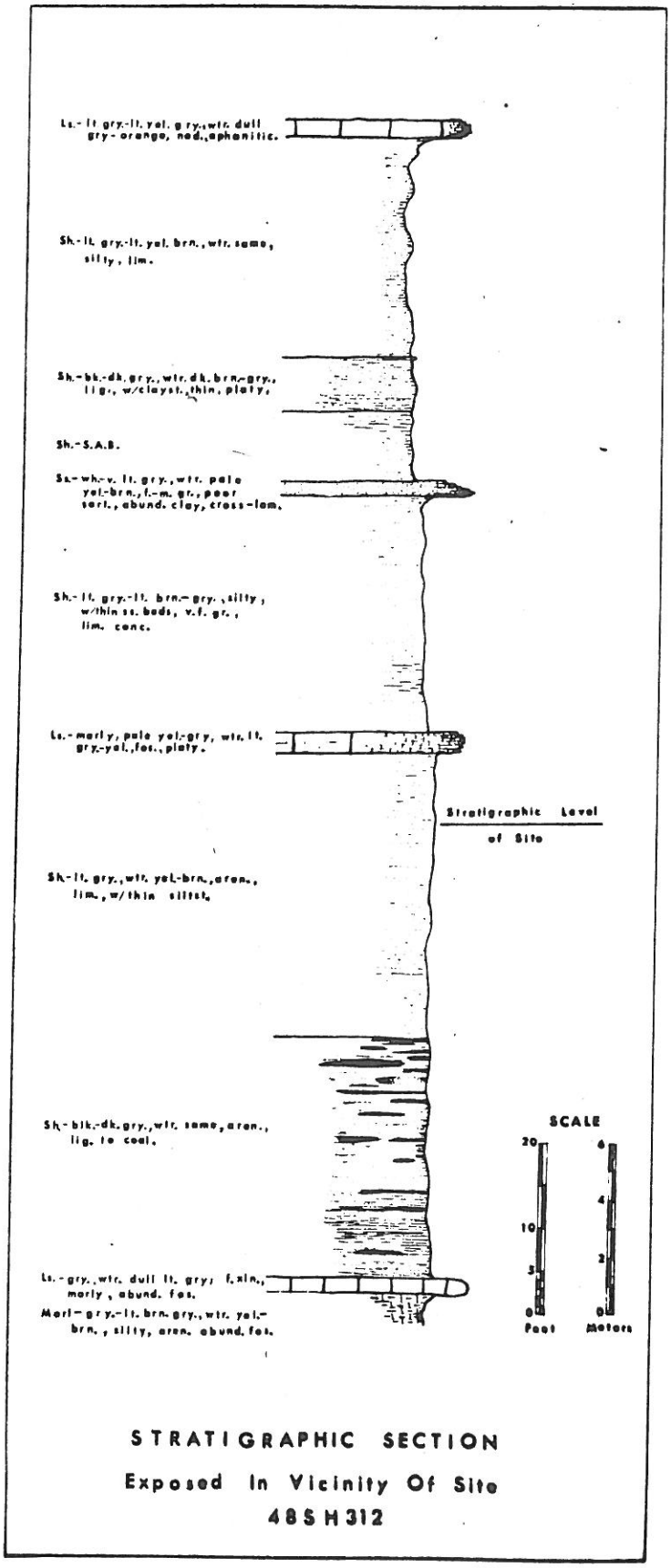
TABLE I. REGIONAL CORRELATION OF ALLUVIAL TERRACE SEQUENCES

		IV	V	VI
GLACIAL CHRONOLOGY	ABSOLUTE AGE Years Before Present	SAN JON SITE NEW MEXICO (Judson, 1953)	GRANTS NEW MEXICO (Bryan & McCann, 1943)	GALLUP NEW MEXICO (Leopold & Snyder, 1951)
NEOGLACIATION	0	Modern dunes & channel cutting	Modern arroyo & dunes	Modern arroyo
	100	WHEATLAND FORMATION (post circa 1400 A.D.)	Upper part of "Late Alluvium"	Late channel fills
	500	Channel cutting & deflation (circa 1300-1400 A.D.)	Erosion, late dunes, pottery	Erosion
	1000	SAND CANYON FORMATION (Upper) (in part later than 1 A.D.	"Late Alluvium"	NAKAIBITO FORMATION (Upper) Pottery dated 900-1000 A.D.
	3000	Channel cutting, eolian features		Erosion
	3500	SAND CANYON FORMATION (Lower) (Collateral Yuma) projectile points	SAN JOSE COMPLEX	NAKAIBITO FORMATION (Lower)
	5000			
ALTITHERMAL		Channel cutting, sand dunes, deflation	"Old Dunes" Broad arroyo	Erosion, paleosol
	7500			
WISCONSIN STAGE		SAN JON FORMATION San Jon Folsom (?) Plainview (?) projectile points, extinct fauna	"Intermediate Alluvium"	CAMERCO FORMATION

TABLE I. REGIONAL CORRELATIONS OF ALLUVIAL TERRACE SEQUENCES

GLACIAL CHRONOLOGY	ABSOLUTE AGE Years Before Present	VII HOPI ARIZONA (Hack, 1942)	VIII BIG BEND REGION TEXAS (Albritton & Bryan, 1939)(Kelly, Campbell, & Lehmer, 1940)	IX HIGH PLAINS TEXAS (Huffington & Albritton, 1941) Evans & Meade, 1945)
NEOGLACIATION	0	Modern dunes & channel cutting	Modern channel cutting	MONAHANS FORMATION (Upper) modern channel cutting
	100	NAHA FORMATION (post 1300 A.D.)	KOKERNOT FORMATION	Low terrace & Recent fill
	500	Erosion (post 1200 A.D. & pre 1500 A.D.)	Channel cutting	MONAHANS FORMATION (Main) channel cutting
	1000	TSEGI FORMATION (possible erosion)	CALAMITY FORMATION (Erosion?)	Intermediate terrace & Recent fill
	3000	TSEGI FORMATION (1000-2000 B.C.) modern fauna	CALAMITY FORMATION	
	3500			
	5000			
ALTITHERMAL		Dunes, channel cutting	Eolian features, broad channels	JUDKINS FORMATION Channel cutting
	7500			
WISCONSIN STAGE		JEDDITO FORMATION proboscidian	NEVILLE FORMATION Elephas & Equus	High terrace, Late Pleistocene & TAHOKA CLAY, Plainview projectile point extinct fauna

Modified from Leopold & Miller, 1954



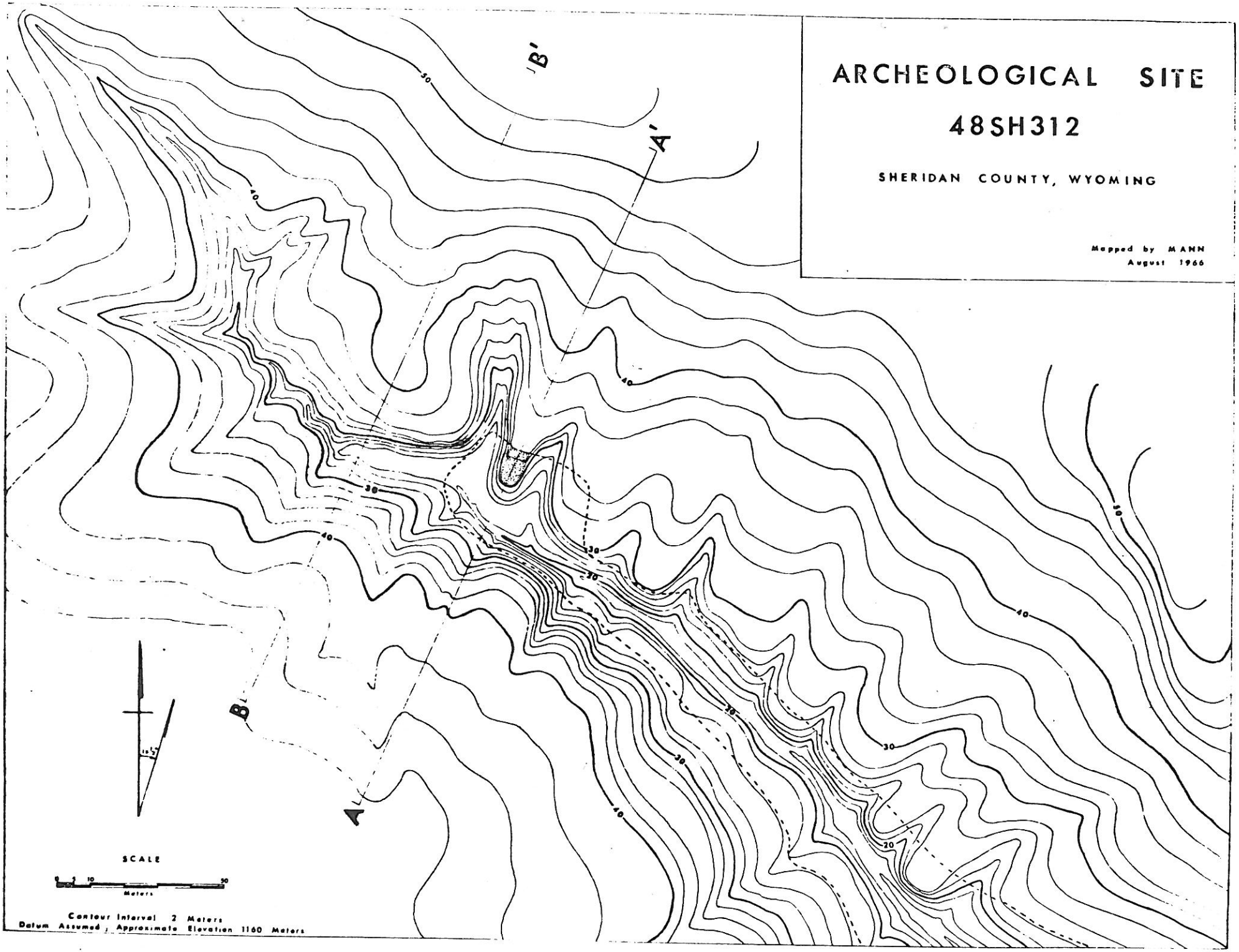
STRATIGRAPHIC SECTION

Exposed In Vicinity Of Site

48SH312

FIG. 1. Strata of the Fort Union (Paleocene) exposed in ravine in which the site occurs.

FIG. 2 Contour map of site (stipled) vicinity based on a plane table survey. Approximate configuration of ravine floor at time of bison kill indicated by dashed line.



ARCHEOLOGICAL SITE
48SH312

SHERIDAN COUNTY, WYOMING

Mapped by MANN
August 1966

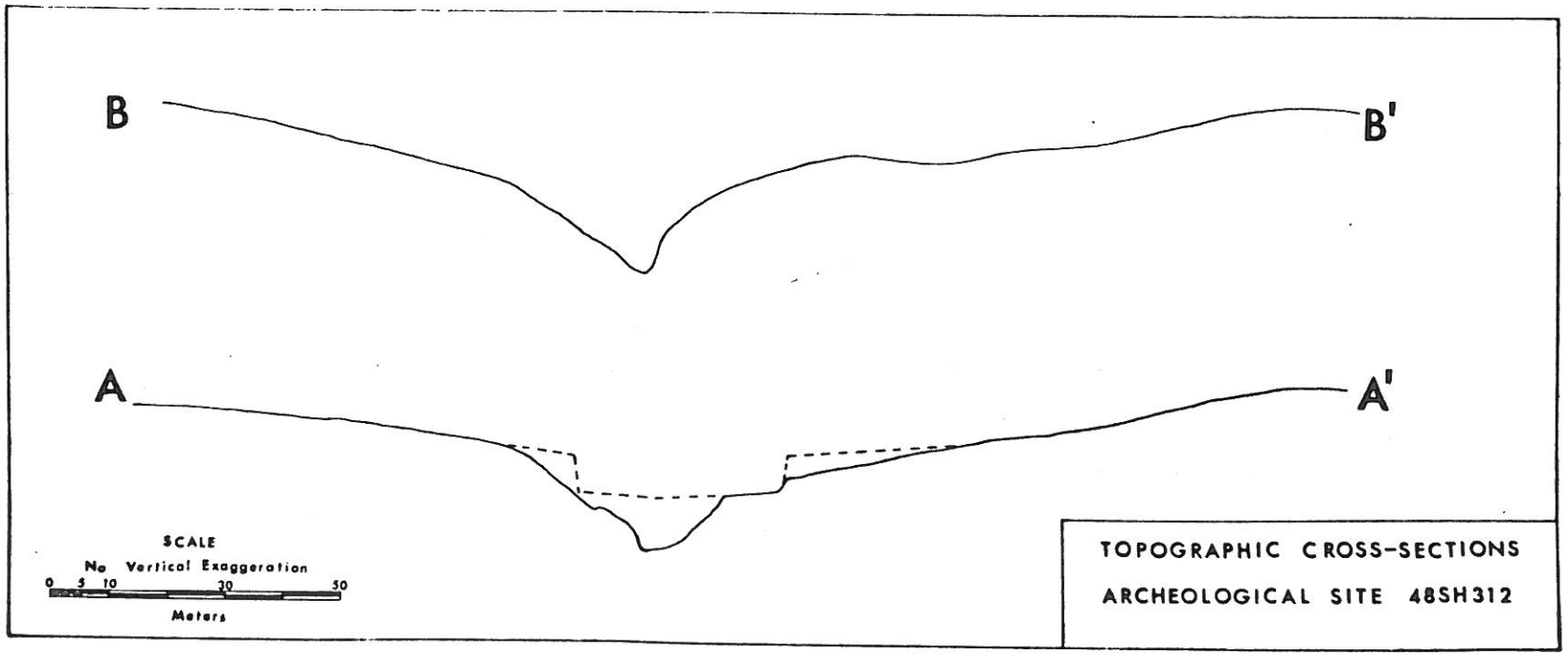


FIG. 3. Topographic cross-sections indicating the general shape of present ravine up to the site (AA') and just beyond (BB') the site to the head of the ravine. Interpreted shape of the ravine at time of bison kill is indicated by dashed lines. Ravine erosion above the site (BB') is believed to be entirely post-site. (See FIG. 2 for location of cross-sections.)