Archaeological survey of the upper Yellowstone River drainage, Montana

George William Arthur

The University of Montana
AN ARCHAEOLOGICAL SURVEY OF THE UPPER YELLOWSTONE RIVER DRAINAGE, MONTANA

by

George W. Arthur

Agricultural Economics Research Report No. 26
Department of Agricultural Economics and Rural Sociology
Montana Agricultural Experiment Station
Bozeman, Montana

October, 1966
Type IV. Very thin utilized chips (Figure 26, g-i).

These scrapers may be flaked along several edges.

Sample. Fourteen specimens

Material: Jasper, agate, chalcedony

Size: Length: rarely more than 4.0 cm. Width: less than 2.5 cm.

Thickness: less than 0.4 cm.

Provenience: 24PA302
24PA309
24PA321

Davis, Leslie B. and Emmett Stallcop
ACKNOWLEDGMENTS

To Doctors Dee C. Taylor, Carling I. Malouf and George F. Weisel of the University of Montana go my thanks for their encouragement of the project and for their constructive criticism that helped bring the manuscript to its final completion.

Fellow students who were especially helpful were Leslie Davis, Lawrence Loendorf, and Allan Carmichael.

Mr. Aubrey Haines, Historian for Yellowstone National Park gave perceptive criticism of the work, and also helped secure permission from the U. S. Forest Service to excavate the Eagle Creek Site. Mr. Otho Mack of Gardiner, Montana, loaned specimens and gave useful information about the Gardiner locality.

Dr. Alvin Southard of the Montana State University Department of Plant and Soil Science secured soil samples from the Eagle Creek Site, ran tests on them, and wrote the Appendix that appears in this report.

Thanks are due the Billings Archaeological Society and especially to Mr. Stuart Conner for sharing with me his apparently unlimited fund of historical and archaeological information about this region.

Members of both the Livingston Archaeological Society and the Gallatin Valley Archaeological Society gave information that helped make the survey successful.

Roger Wegner, cartographer at Montana State University made several of the illustrations included in the report. Other drawings were made by Diane Walters, who majors in art at Montana State University.
Invaluable aid was received from several classes of students who took my archaeology field course and excavated at the Eagle Creek Site and at the Carbella Site.

Members of the secretarial staff at Montana State University who typed the manuscript include Mrs. Alice O'Connor, Miss Norma Erickson, Mrs. Judie DeBock, and Miss Peggy Grisamer. The final copy was typed by Mrs. Cherl Pattee.

Thanks go to my wife, Carol, who has urged completion of this project since it started, and to my children who have made it worthwhile.

To all the unnamed others who shared their time and effort on my behalf, I extend my sincere appreciation.

However, for errors in the manuscript and any shortcomings in interpretation, the responsibility is solely mine.
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CHAPTER I

INTRODUCTION

Area Defined

For purposes of this thesis study, the area may be geographically delineated as the upper 100 miles of the Yellowstone River Basin as far as the Yellowstone National Park boundary, encompassing those portions of Gallatin, Park, and Sweetgrass Counties that fall within the Yellowstone River drainage (Figure 1). Two main tributaries of the Yellowstone, the Shields River north of Livingston, Montana, and the Boulder River south of Big Timber, Montana, also fall within the thesis area. Two other main tributaries of the Yellowstone, the Gardiner River and the Lamar River, make their confluence with the Yellowstone inside the boundary of Yellowstone Park.

Statement of Problem

The problems of this thesis briefly stated are:

1. The reconstruction of a past life way within the thesis area involving the recovery and assessment of new archaeological data.

2. To relate this past life way to the evidence of past cultures that have been found in surrounding regions.

3. To explain the archaeological remains within the study area and determine if possible what cultural processes (evolution, diffusion, and migration) have operated to
produce the particular archaeological assemblage that was recovered.

Hypothesis

From cultural features and from artifacts collected at sites in the thesis area compared with cultural features and artifacts from other areas, and correlated with evidence from other disciplines, problems and relationships exist that can be established with surrounding regions. Therefore, it is hypothesized that the Upper Yellowstone drainage will show relationships to:

1. The Northwestern Plains;
2. The Montana Western Region;
3. The Snake River Plain;
4. The Columbia Plateau;
5. The Great Basin.

Methodology

This survey resulted from the larger investigation of Yellowstone National Park that commenced in 1958 under the direction of Dr. Carling I. Malouf and was completed in 1959 under the supervision of Dr. Dee C. Taylor, both from the University of Montana at Missoula. We felt that a survey of sites in the Upper Yellowstone north of the Park might add significant supplementary data to that resulting from the investigations undertaken in the Park.

My survey commenced in the summer of 1959, and continued during the summer of 1960, as time permitted, with intermittent field work since that time.
Figure 1.

UPPER YELLOWSTONE DRAINAGE

SITE LOCATIONS

Crazy Mountains

Big Timber

Livingston

Absaroka Range

Yellowstone National Park

Montana

Wyoming
I began work by delving into local history and geology, by interviewing local artifact collectors, farmers, ranchers, and older native residents of the area. Collections of artifacts reportedly found at local sites were examined and photographed for future reference. Following the leads of informants, I made visits to individual sites where information was obtained and recorded. I considered this approach successful at the time because a substantial amount of information was obtained, often from sites subsequently destroyed by local collectors.

A total of forty-four sites were examined and recorded during the survey. Although many sites were simply chip-strewn spots which yielded few artifacts, other locations combined a number of distinct archaeological features that were included under a single site number.

Recording of sites was accomplished by using Missouri River Basin Site forms with additional notes, maps, and photographs. Sites were assigned numbers under the Smithsonian trinomial system.

Plan of Presentation

During the past several years three culture-historical constructs have appeared in print in response to new data from areas related to the Upper Yellowstone. For example, in Idaho, Swanson (1962b) recognizes three basic cultures: the Old Cordilleran, the Mountain-Plains, and the Bitterroot. In Alberta, Canada, Wormington and Forbis (1965) have defined three cultural stages that they have called the Paleo-Indian Stage, the Meso-Indian Stage, and the Neo-Indian Stage. Missouri River Basin archaeologists (Lehmer and Caldwell:1966) have strongly advanced a modification of Willey and Phillips (1962) classification that consists of a
series of "spatial divisions" and "archaeological units," with "horizon" and "tradition" modified from their original definition to meet the needs of Plains archaeology.

However for purposes of comparison and cultural differentiation in time, the arbitrary cultural horizons constructed by William Mulloy, as outlined in *A Preliminary Historical Outline of the Northwestern Plains* (Mulloy 1958) have been utilized in this report. Mulloy divides Plains occupation into five cultural periods: The Early Prehistoric Period, beginning about 13,000 years ago; Middle Prehistoric Period, divided into an Early and Late sequence beginning some 6,000 years ago; Late Prehistoric Period, beginning about A.D. 500; and the Historic Period, dating after A.D. 1800.

Another construct, Ernst Antev's Neothermal (Antevs 1948) with its division into the temperature phases of Anathermal, Altithermal, and Medithermal have also been utilized for discussion of climatic changes. However, I have tried to be aware of the cautionings of Bryan and Gruhn (1964) relative to the use of this construct.

**Summary of Archaeological Work in the Yellowstone Valley**

Until 20 years ago, a few essays on the archaeological history of the Yellowstone River Valley comprised nearly all that was known of the archaeological history of Montana. With the creation of Yellowstone National Park by act of Congress in 1872, an increasing amount of scientific information concerning the Park and environs began to flow into Washington D. C. Some reports contained significant archaeological information such as those of Park Superintendent Norris describing an aboriginal
stone quarrying site in Paradise Valley north of the Park (Norris 1882a: 327-328). In 1892, a Colonel Brackett reported a site near the present town of Emigrant, Montana, where stone piles about four feet high appeared strategically placed on an almost inaccessible plateau and possibly were used as watchtowers or fortifications (Brackett 1892:577-581). In the same report Brackett described a large buffalo "trap" that is very likely the Large Emigrant Jump. After Brackett's report I could find little that was significant about Yellowstone Valley archaeology in the literature until 1932 when Barnum Brown's work on the Emigrant Bison Drives was published by the American Museum of Natural History (Brown 1932:75-82).

During the depression years a statewide archaeological project was initiated under the Works Progress Administration. Most of the work, however, was confined to the Yellowstone Valley close to urban centers. Under this project, in 1937, archaeological excavations commenced at Pictograph Cave several miles southwest of Billings, Montana. Director of the project was Professor Melville Sayre, a geologist from the Montana School of Mines at Butte. His field supervisor was Oscar Lewis of Billings. In 1938, excavations started at the Hagen Site, an earthlodge village, near Glendive, Montana. Mr. Wahle Phelan was field supervisor, under the project director, Professor Sayre. During this same year work also began at a site near Red Lodge, Montana.

In 1939, the project was discontinued with the resignation, and death soon after, of Professor Sayre. However, work resumed again in 1941 under the capable leadership of William Mulloy. The following year, Mulloy published two important papers on work resulting from the project,
one on the Hagen Site near Glendive (Mulloy 1942a), and the other on research at the campsite near Red Lodge, Montana (Mulloy 1942b:170-179). The most important result of Mulloy's Yellowstone research, however, was the synthesis of data from Pictograph Cave in a publication in 1958 entitled, "A Preliminary Historical Outline for the Northwestern Plains". This publication introduced an important conceptual framework for reconstructing Northwestern Plains archaeology.

After Mulloy's work in the early 1940's, no significant research on Yellowstone archaeology was produced until the Yellowstone Park survey was undertaken in 1958 and 1959. The results of this research were written by Dr. Dee C. Taylor and submitted to the National Park Service. (Taylor 1964).

The Missouri River Basin Surveys, beginning in 1961, sent archaeological field crews into the Yellowtail Dam reservoir on the Big Horn River southeast of Billings, Montana. Under the leadership of River Basin archaeologist Wilfred Husted, significant information has been gathered, and to date, two short preliminary reports have been published on this material. A more detailed analysis, however, is being written by Mr. Husted.

Recent archaeological investigations in the Upper Yellowstone have been accomplished by Yellowstone Park Historian, Aubrey Haines. Perhaps his most notable archaeological contribution, thus far, has been to excavate the Rigler Bluffs Site (24PA401). The site consisted of a rock-lined hearth overlain with eight feet of former lake silts. Artifacts consisted of a small obsidian point believed to be a "Hanna Point", a thumb scraper, chips, bone fragments, and lumps of charcoal. Subsequently,
several radio-carbon dates were obtained from the charcoal. The dates averaged an age of $3,078 \pm 250$ B.C. (U.S.G.S. Laboratory, No. W-1135, June 8, 1962).
CHAPTER II

GENERAL DESCRIPTION OF THE UPPER YELLOWSTONE

Topography

Two distinct physiographic provinces, the High Plains and the Rocky Mountains, converge in southcentral Montana to form the scenic area defined in this paper as the Upper Yellowstone.

Two major ranges, the Gallatin and Bridger Mountains, form the western boundary of the area. The eastern boundary follows the Main Boulder River south of Big Timber that bisects another major range, the Beartooths. A small spur range, the Crazy Mountains, completes the Eastern flank just north of the Beartooths. The ruggedness of these ranges is summarized in Fenneman's (1931:157) subdued description of the Snowy Range of the Beartooths.

Their ruggedness comes in part from steep-sided peaks or ridges rising above the general level and oversteepened by the work of alpine glaciers, but chiefly from dissection by narrow and profound canyons.

The sawtoothed eminence of the Beartooths is capped by Granite Peak (elevation 12,850 feet) the highest point in Montana. According to Fenneman (1931:158) the crests of these mountains:

... are generally between 10,000 and 11,000 feet high or 3,500 to 4,500 feet above the plains. In the eastern part, within an area 20 miles long and 8 miles wide, many remnants rise above 12,000 feet.

Dissecting this area are the Yellowstone River and two of its main tributaries that begin high on the large pine covered Yellowstone Plateau. Winding in a northerly direction from its headwaters just
south of Yellowstone Lake, the Yellowstone River flows northwestward to the northern edge of the Park. Flowing westward along the southern scarp of the Beartooth Range, it is joined by the Lamar River which originates in the Hoodoo Basin in the easternmost reaches of the Park. At Gardiner, Montana, where the Yellowstone leaves the Park, it is joined by the north flowing Gardiner River. Dropping sharply from the Park plateau through the narrow and steep-walled Yankee Jim Canyon, the Yellowstone emerges into Paradise Valley and flows gently northward to Livingston, Montana. Turning eastward at Livingston, it is joined by the Shields River, that flows out of the Crazy Mountains. Continuing its movement east, the Yellowstone flows between the northern edge of the Beartooths and the southern end of the Crazy Mountains to Big Timber where it junctures with the Boulder River flowing northward out of the Beartooths. From this point the Yellowstone leaves the thesis area and sweeps through Billings, Miles City, and Glendive in a wide arc to the northeastern part of the state, where it joins the Missouri River a few miles east of the Montana-North Dakota boundary.

Geologic History

Since our interest in the Upper Yellowstone is related to the present topography of the area, a sketchy summation of the geologic processes may aid our understanding of man's presence there.

Late in the Mesozoic era, modern diciduous trees had appeared, and the dominance held by the dinosaurs was being taken over by the small, but swift mammals. The close of the Mesozoic marked the beginning of the Laramide revolution, a major mountain building epoch over
the world, that affected the length of the Rocky Mountains and resulted in folding, faulting, and crustal uplift (Moore 1958:366-393).

During the Cenozoic era that followed, diastrophism continued in the Rocky Mountains. The countering effect of erosion, during the Eocene epoch, poured sediments into the basins adjacent to the mountains. Swamps were formed and slowly built up in the Floridan climate that prevailed. Vulcanism became intensified during late Eocene through early Pliocene as uplift continued (Horberg 1940:275-303).

In Yellowstone Park, events similar to those elsewhere in the Rockies were occurring so that during the early Cenozoic, periods of uplift and folding alternated with periods of quiet and erosion. Vulcanism accompanied uplift and folding, showering the countryside with volcanic ash, dust, sand, and coarser material, which became the volcanic breccias. During times of quiet, mediterranean and semi-tropical forests flourished only to be quickly covered by fragments of hot rock, sand, and dust to depths of twenty to forty feet (Bauer 1955:20-24).

Today, in the Specimen Ridge area of the Park, twenty-seven fossil forests have been identified in a total sequence of about 1,700 feet of volcanic tuffs and breccias (Dorf 1960:253).

Similar events were being repeated in the Beartooth and Gallatin Ranges extending northward out of the Park. The Beartooth Range, forming the eastern boundary of Paradise or Yellowstone Valley south of Livingston, is divided into the North and South Snowy blocks by the east-west running Mill Creek fault located midway in the Valley. The spectacular sweep of the Beartooths is produced mainly by displacement resulting from a local fault system (Horberg 1940:277-278). Most impressive is the
Gardiner thrust fault near Gardiner that marks the southern boundary of the Beartooths. According to Bauer (1955), the displacement of this fault is at least 12,000 feet and its length may extend as far east as the vicinity of Cody, Wyoming.

The north-south trending Gallatin Range forms the western boundary of Paradise Valley, and extends southward to form the northwestern boundary of Yellowstone Park. The general elevation of the Gallatin Range is somewhat less than that of the Beartooths and the slopes are less abrupt. Horberg (1940:277) attributes this to the fact that Paradise Valley occupies a downfaulted position to the North and South Snowy blocks.

A general indication of the age of the Gallatins is found in the Gardiner and Mill Creek faults. Similar faults, appearing on the western slopes of the Gallatin Range and in Gallatin Valley, are believed to be continuations of the Gardiner and Mill Creek faults. If this is true, then the fact that these faults continue under the Gallatin Range is strong evidence that the Gallatins were buried by younger volcanic rock after faulting occurred. Vulcanism followed by periods of quiet were repeated many times during the Cenozoic, so that eventually the first mountains were levelled down and buried beneath six to eight thousand feet of breccias and lava sheets. However, as uplift continued, the park and all the surrounding mountains and valleys gradually became cooler with the increase in altitude. Alpine situations developed with an increasing snowfall that failed to melt as rapidly as it fell.

The Pleistocene epoch, believed to have begun about a million years ago, was characterized in the northern hemisphere by advances and
retreats of continental ice sheets. In the Rocky Mountains, Blackwelder (1915:310) discerned three glacial stages in western Wyoming and hinted at an older fourth stage. From recent work in the Gallatin and Madison Ranges of southwestern Montana, Hall (1959:1778) concluded positive recognition of two and possibly three glacial stages in that area.

The earliest of Blackwelder's three glacial stages, the Buffalo, believed to be pre-Wisconsin, was an extensive piedmont glacier that attained elevations of at least 7,500 feet. Buffalo ice appears to have nearly covered Yellowstone Park and many of the present mountain peaks in the Beartooth and Absaroka Ranges. The Buffalo sent fingers of ice spilling into all of the valleys surrounding the Park and may have extended northward in Paradise (Yellowstone) Valley to Barney Creek near the present village of Pine Creek, Montana (Horberg 1940:295).

Although the age of Buffalo ice remains undetermined, carbonized wood from laminated silt believed to be later than the Buffalo stage yielded a radiocarbon date in excess of $27,100 \pm 800$ years ago (Love 1956: 149). More recently, a C-14 age greater than 35,000 years ago was obtained from post-Buffalo silt containing abundant sea shells and a jaw of a gopher. (Meyer Rubin, written communication to Love and Montagne, 1965: U.S.G.S. Lab No. 2-1558).

Blackwelder's succeeding glacial stage, the Bull Lake, appears to have been widespread but of less magnitude than the preceding Buffalo stage. According to Blackwelder (1915:333) the glaciers of the Bull Lake and the later Pinedale stage were ordinary valley glaciers that seldom pushed beyond the mouths of the canyons in which they developed. The
Yellowstone Glacier in northwestern Yellowstone Park and the adjacent Yellowstone Valley is correlated with the Bull Lake glacial stage by Horberg (1940) and described by Weed (1893:14) as follows:

The glacier occupying the mountain valleys of the Yellowstone has for convenience of reference been called the Yellowstone glacier. The ice stream had its source in the confluent ice sheets that covered the northwest portion of the National Park, and flowing northward overrode the lesser peaks about the boundary of that reservation and sent a great ice stream down the valley of the Yellowstone. This glacier, reinforced by a confluent stream from Bear Gulch, completely filled the upper valley and extended far up on the mountain sides, completely covering such minor elevations as Cinnabar, Sphinx, and Dome mountains as it flowed northward to the low and broad valley below Yankee Jim Canyon. This valley it occupied as far north as Mill Creek, a total length of 36 miles from the Park boundary. The width varied from 3 to 6 miles, and the depth in Yankee Jim Canyon and the valley above it was 3,000 feet.

Bull Lake glaciation can be recognized in Paradise Valley from moraine remnants about one mile north of Pray, Montana, and the ice-margin channels and terraces on the mountain slopes between Big Creek and Friddle Creek on the west side of the valley (Horberg 1940:298-301). The age of the Bull Lake stage remains undetermined, but Love and Montagne (1956:176) referring to recently tilted glacial terraces in Jackson Hole, Wyoming, state:

Terrace T4—This is the oldest and least extensive of the terraces, and is covered in part by loess and ashy silt. It is older than the Bull Lake (middle) glacial stage in this area and younger than the Buffalo (oldest) stage. A laminated silt deposit 500 feet above Pilgrim Creek in the northern part of Jackson Hole (sec. 29, T. 46 N., R. 114 W.) contains carbonized wood with a carbon-14 date of 27,100 ± 800 years (Meyer Rubin, personal communication, U.S.G.S. Lab. No. W-312). The stratigraphic relations of this deposit to Buffalo and Bull Lake glacial stages have not been adequately studied but it is thought to be post-Buffalo and pre-Bull Lake and may possibly be equivalent to the loess and ashy silt on Terrace T-4.
Recent radiocarbon dates indicate that the Bull Lake stage was in progress about 30,000 years ago.

The youngest of Blackwelder's glacial stages, the Pinedale, is characterized by a general confinement of ice to the higher mountain valleys, seldom reaching the limits of previous glaciers. In Paradise Valley (Yellowstone Valley), Horberg (1940:301) states that Pinedale ice:

... reached a point about two miles north of Emigrant. South from that point the drift margin is marked by a well-defined terminal moraine fringed by a narrow outwash apron and numerous outlet channels. West of the river there is no evidence that the ice reached beyond the western edge of the present inner valley.

On the western or Gallatin Range side of the valley, only the valleys of Tom Miner Creek and Big Creek appear to have been covered by Pinedale ice. Since there is no evidence of a terminal moraine at the mouth of Tom Miner Creek, ice from this creek was probably tributarial to the larger glacier flowing through Yankee Jim Canyon (Horberg 1940:303).

In Jackson Hole, two radiocarbon dates were obtained from shells in a white marl associated with outwash gravels of the Pinedale glaciation. According to Love (1956:150):

If the stratigraphic relationships of these marls are interpreted correctly, ice of the Pinedale glacial stage was present on the floor of Jackson Hole as recently as 9,000 years ago.

According to Montagne (personal communication) radiocarbon dates from other areas bracket Pinedale glaciation between 8,000 and 12,000 years ago. However, glaciation may have persisted in the Beartooths and Yellowstone Park more recently than 8,000 years ago. For as Montagne (1956:30-31) says:
As in other Rocky Mountain ranges, the mountains which surround Jackson Hole were somewhat glaciated during the periodic resurgence of glacial conditions during very late Pleistocene and Recent Time. The seven or more active glaciers that remain in the Teton Range today owe their survival to a delicate balance of accumulation and ablation maintained in deep and protected cirques.

Post-glacial conditions in the Upper Yellowstone, including Yellowstone Park, are largely conjectural. Ecological studies are absent so that knowledge of the climate and biological environment remains undetermined. Reconstructions, then, are hazardous extrapolations of studies from outside this area.

For the western United States, Ernest Antevs (1948 and 1955) divides the past 10,000 years (the Neothermal) into three temperature periods: The Anathermal, Altithermal, and Medithermal. The Anathermal, the cool, moist period following the retreat of glaciation was ended by the warm, dry, Altithermal throughout the west. This in turn was followed by the Medithermal and a return to climatic conditions similar to those of the present.

Bryan and Gruhn have recently warned against an uncritical use of Antev's three periods. They caution that:

... a given span of Neothermal time cannot be projected from one area to another without direct independent evidence of the actual climatic conditions which existed in the second area at that time. (Bryan and Gruhn 1964:307).

Since ecological conditions vary locally, they suggest that Antev's three temperature ages:

... be used not as time periods with fixed absolute dates or climatic periods with defined characteristics, but rather be considered as phases of the Neothermal temperature curve ... (Bryan and Gruhn 1964:307).
Considered as phases, the cool, moist Anathermal must have been relatively short in the Upper Yellowstone since glaciation may have persisted there as late as 8,000 years ago. In the Priest Lake area of Northern Idaho, Hansen's (1947:114) post-glacial climatic studies show the Altithermal well underway during the Mt. Mazama eruption 6,600 years ago (Fryxell 1965:1288-1290). Whether similar conditions existed in the Upper Yellowstone at that time are unknown. However, the persistence of a big game hunting economy as shown by deer, elk, and bison remains in the Middle Period Site (Carbella Bridge Site, 24PA302), and a corresponding lack of grinding stones suggests a milder, less arid Altithermal in the Upper Yellowstone Valley than was indicated at Pictograph Cave.

Dates for the beginning of the Medithermal Phase are unknown for the Upper Yellowstone.

Present Climate

The following information is selected from a summary of climate in Montana written by R. A. Dightman, Weather Bureau State Climatologist for Montana, and published in 1960 by the U. S. Department of Commerce.

In the Upper Yellowstone, three weather reporting stations located at Big Timber, Livingston, and Mammoth indicate an annual mean temperature varying less than ten degrees from the lowest elevation (4,073 feet) at Big Timber, to the highest elevation (6,239 feet) at Mammoth.

The U. S. Department of Commerce summary of climate for Wyoming (1960) shows that the southern end of Yellowstone National Park receives a greater amount of precipitation than the Yellowstone drainage in the
northern part of the Park. For example, South Entrance receives 31.53 inches annually (the average for 1931-1955). The Bechler River Station over a twenty-two year period had an annual average of 38.22 inches. However, at valley 6W in the Absaroka Mountains, a six year average at 9,000 feet elevation was 44.32 inches. At Mammoth, however, the annual precipitation is 15.03 inches, varying less than an inch with the two other reporting stations at Livingston and Big Timber.

The following Figure summarizes weather data from the three reporting stations in the Upper Yellowstone.

<table>
<thead>
<tr>
<th>Reporting Station</th>
<th>January</th>
<th>July</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temp</td>
<td>Precip</td>
<td>Temp</td>
</tr>
<tr>
<td>Big Timber, Montana</td>
<td>27.3</td>
<td>.48</td>
<td>70.9</td>
</tr>
<tr>
<td>Livingston, Montana</td>
<td>25.2</td>
<td>.50</td>
<td>68.5</td>
</tr>
<tr>
<td>Mammoth, Yellowstone Park, Wyoming</td>
<td>18.3\textsuperscript{1/}</td>
<td>1.12</td>
<td>62.9</td>
</tr>
</tbody>
</table>

\textsuperscript{1/} Temperature and Precipitation means given are for the Yellowstone drainage and not for the total Park area.

FIGURE 2

WEATHER REPORTING STATIONS IN THE UPPER YELLOWSTONE

Flora and Fauna

The finger-like valleys of the Upper Yellowstone, extensions of the plains into the mountains merging with the ever increasing altitudes of the high mountains, exhibit a rich variety of gradually changing plants and animals peculiar to the changing ecological scene.

Forests consist mostly of lodgepole pine, white pine, Engleman spruce, Douglas and Alpine fir, several varieties of juniper, and at
tree line elevations, Whitebark pine. The mountains, laced with open
grassy parks, are dotted with groves of quaking aspen, cottonwoods, and
alder and willow thickets around lakes, springs, and streams (Marks 1963).

Attempts to list all of the flora of the Yellowstone would be
lengthy and of little use to archaeologists. However, many trees, plants,
and shrubs native to the area had economic uses among the Indians living
in and frequenting the Upper Yellowstone. Among the shrubs and plants
with edible parts are: Chokscherry (found throughout the entire state
of Montana), wild raspberry, gooseberry, wild strawberry, service berry,
elderberry, currant, wild onion, Indian turnip, camas, bitterroot and
squawberry. Berries were usually eaten raw or mixed with dried meat
and tallow and stored for winter use. Tubers were usually cooked before
eating.

Many of the more common trees of the Upper Yellowstone had various
uses among the Indians. According to Blankenship (1905), Alpine or
Balsam fir twigs and leaves were burned for incense by the Crow Indians,
and the balsam or gummy secretions found in the blisters on the bark
were highly esteemed as an antiseptic for application to wounds and ulcers.
Lodgepole pine provided lodgepoles for the framework of tipis, and the
inner, cambium layer of the bark was eaten by the Indians in times of
food scarcity. The leaves of Douglas fir were used in the sweatlodge
as a cure for rheumatism.

The present day diversity of physical features in the Upper Yellow­
stone, affording abundant water, shelter, grasses, and seclusion, com-
bined with Yellowstone Park as a zoological park where animals may roam
unmolested by man, provides a varied faunal assemblage unsurpassed anywhere else in the United States.

According to the Yellowstone Park information manual (no date), in early historic times, bison, mountain sheep, elk, deer, bear, wolf, and coyote inhabited the high plains and foothills of the mountains. Today, these animals are generally found in the secluded recesses of the mountains or in game parks such as Yellowstone Park.

All of these animals were important in the myths and legends of the Indians. Certainly of more importance, however, was the meat that all of the large game animals provided along with their hides that were utilized principally to make lodge coverings, clothing, and containers.

Among the large ruminant animals inhabiting the Upper Yellowstone are: Wapiti or elk, moose, pronghorn antelope, mountain sheep, bison, mule deer, and until about 1930, whitetail deer (Yellowstone Information Manual: No date).

Carnivores of the Upper Yellowstone include: Grizzly and black bear (cinnamon, brown and black), grey wolf, coyote, mountain lion, Canadian lynx, bobcat, red fox, badger, wolverine, weasel, mink, Canadian otter, fisher, pine marten, and skunk. Other Yellowstone mammals that may be classified as gnawing animals include: Beaver, woodchuck, porcupine, muskrat, several species of squirrel, chipmunk, rabbit and other smaller animals.

Hundreds of species of birds are found in the Upper Yellowstone. These range in size from bald eagles and owls to the small humming-bird. According to Brodrick (1952:2) many of these species are found only in
certain localities and habitats. Others, however, are more widely distributed. These include: Eagles, and smaller sized hawks, many species of ducks and goose, grouse, owls, crow, magpie, and numerous other families and species of smaller birds. From evidence found on the Molly Islands of Yellowstone Lake in the Park, the Indians apparently took birds, eggs, and feathers from the rookeries found on these small islands (Taylor 1964).

Of the various food fishes present in the Upper Yellowstone only three are listed by the Bureau of Fisheries (Bailey 1930:229) as native. These are the cut-throat trout, mountain grayling, and the Rocky Mountain whitefish. However, in 1890, other game fishes were introduced into Yellowstone Park and include: Rainbow trout, eastern brook trout, lake trout, European brown trout, loch leven trout and yellow perch (Bailey 1930:229); (Chittenden 1940:216).

There are few reptiles and amphibians in the Upper Yellowstone. Chittenden mentions three snakes, among which are the large bull snake, water snake, and rattlesnake. However, rattlesnakes are seldom seen in Yellowstone Park, rarely venturing above altitudes of 6,000 feet. They are very common, however, in Yankee Jim Canyon and in Paradise Valley north of the Park. Also, I observed a specie of lizard around specific thermal basins in the Park. Amphibians include a common toad, frogs, and salamander (Bailey 1930:230).

Insect life is abundant in the Yellowstone Valley, and mosquitos, common house fly, horse fly and deer fly make life miserable in all areas and altitudes of the Upper Yellowstone. According to Bailey (1930:231),
Skinner collected and identified 173 species of insects in Yellowstone Park.

Upper Yellowstone History

In 1805, when Lewis and Clark arrived at its mouth and prepared to ascend the Yellowstone River on their journey westward, the name "Yellow Stone" was well known among the Indians of the region, and among the French trappers who called it the "Roche Jaune" or "Yellow Stone" (Chittenden 1940:2). Among the traders and trappers of the Northwest Fur Company, the name was also well established, and perhaps, as Chittenden (1940:5) suggests, resulted from the sulphurous yellow clays described in the journals of early trappers and explorers who visited Yellowstone's "Grand Canyon".

Although historic tribes have given little knowledge of the Upper Yellowstone and of the Park itself, and despite the fact that numerous reports have claimed that the Indian possessed a superstitious fear of the Park's geyser regions, therefore avoiding them, archaeological evidence is overwhelmingly to the contrary. Many sites found during the Park archaeological survey of 1958–59 were located in thermal areas.

Historical accounts lend support to the archaeological evidence. The timid, humble, Tukudika, or more commonly, the Sheepeaters, were known to have been the Park's permanent residents. During their occupation of the area they certainly encountered the thermal areas throughout the Park. Chittenden (1940:11–13) mentions that surrounding tribes referred to the Park as the "Burning Mountains" and that they occasionally visited the Yellowstone Lake and River portions of the Park, but
seldom visited the geyser regions and never wintered in the Park. On the other hand, Beal (1949:90) pointed out that in 1935, when two members of Chief Joseph's band who had crossed the park with Joseph in 1877, were asked if the Nez Perce were afraid of the geysers, they said "No" and implied that they had used them for cooking.

Indian trails were reported everywhere by early park explorers, generally along paths since changed to tourist routes. Chittenden (1940:9-10) reported several important trails. One of these followed the Yellowstone Valley entirely across the Park from north to south.

It divided at Yellowstone Lake, the principal branch following the east shore, crossing Two-Ocean-Pass, and intersecting a great trail which connected the Snake and Wind River Valleys. The other branch passed along the west shore of the lake and over the divide to the valley of the Snake River and Jackson Lake. This trail was intersected by an important one in the vicinity of Conant Creek leading up from the Upper Snake Valley to that of Henry Fork. Other intersecting trails connected the Yellowstone River trail with the Madison and Firehole Basins on the west and with the Bighorn Valley to the east.

Of all Indian trails in the Park, most important during the Nineteenth Century was the Bannock Trail that ran east and west across the northern half of the Park. A Park naturalist named Wayne Replogle (1956:22) traced out this famous trail in recent years and found that it came from Henry's Lake, over Targhee Pass, crossed the Madison River, and entered the Park near Campanula Creek. From Campanula Creek it extended across the Gallatin Range to Mammoth Hot Springs where according to Chittenden (1940:10) it was joined by another coming up the valley of the Gardiner River. The trail then moved across the Blacktail Deer Plateau, (where it still remains visible in places) to a fork above
Tower Falls and thence up the Lamar Valley to Soda Butte Creek where it forks. One fork follows Soda Butte Creek and leaves the Park at the Northeast Entrance. The other fork moves eastward and leaves the Park at the headwaters of Timber Creek where it enters the Big Horn Basin of Wyoming.

Of the historic tribes, the Bannock and Fort Hall Shoshoni were the principal travellers over the Bannock Trail, although other tribes used it as well. The Bannocks, formerly one group with the Northern Paiute, had separated from them in prehistoric times, had settled around Fort Hall, Idaho, and with the acquisition of horses, gradually acquired strong Plains traits (Steward 1938:200). The Bannock and Fort Hall Shoshoni wintered together and usually journeyed together on hunting expeditions, often to the headwaters of the Yellowstone and Missouri Rivers (Steward 1938:201, from Lander 1860:121-122). After 1840, the buffalo had disappeared in Idaho. The Shoshoni and Bannock, for mutual protection against marauding Blackfoot and other hostile tribes, alone or in company with Nez Perce and sometimes with Flathead, Lemhi, and Wyoming Shoshoni, travelled across the Rocky Mountains to the buffalo country of the high plains (Steward 1938:201).

The Crow Indians in early historic times also occupied the Upper Yellowstone during certain seasons of the year. During the winter of 1844-45, the famous trapper and scout Jim Bridger wintered with a band of Crow Indians near Emigrant Gulch south of Livingston (History of Yellowstone Valley (Anonymous, no date:117-118).

Under the Laramie Treaty of 1868, part of the Yellowstone Valley was set aside as a reservation for the Crow and all of the land in Park
County east of the Yellowstone River and its tributary, the Shields River, were part of this large reservation. Also the Blackfoot were removed to their present reservation in northern Montana. After gold was discovered in Park County in the 1860's, the reservation boundary was moved eastward. However, the Crow continued to make annual buffalo hunting trips to the Upper Yellowstone in the fall of the year.

Termination of the fur trade in the 1840's led the mountain men of the west into other pursuits. Gradually, tales of gold in the Rockies filtered eastward so that during the early 1860's, a new breed of men entered into the Yellowstone country. White settlements increased with mining as the major economic endeavor. Many of the less fortunate miners, however, turned to farming and other occupations.

During the 1860's and early 1870's, Yellowstone Valley settlers engaged in many skirmishes with Indians of various tribes. Topping (1883:35-38) relates several incidents with Sioux in 1865 that occurred on Fleshman Creek, several miles northwest of Livingston, Montana. In the course of these skirmishes several Indians as well as settlers were killed. Occasional incidents involved Cheyenne and Arapahoe war parties. Sometimes small groups of prospectors venturing into the Crazy Mountains or away from close contact with the white settlements were never heard from again.

Tribes friendly to the settlers from west of the continental divide often camped around Livingston on their way to the buffalo plains.

According to Topping (1883), Flathead, Nez Perce, Shoshone and Bannock were constantly in and out of the Upper Yellowstone in the 1860's.
and early 70's. For example, in February of 1867, Topping (1883:62) states:

There were about forty lodges of Bannocks camped on Fleshman Creek. A stealing party of Flatheads and Pen d'Oreilles, took away a little herd of their horses one night, and next morning a party of Bannocks took their trail and overtook them at the Musselshell river. The Bannocks did not show themselves till night, when they took every horse that their opponents had. The Flatheads went on, but the Pen d'Oreilles, about twenty in number, determined on vengeance and went back afoot. A Bannock hunter saw them when they were crossing the Shields River. He rode back at full speed and alarmed the camp. One hundred Bannock warriors, armed and mounted, went to meet the Pen d'Oreilles, who were found on Fleshman creek, about a mile from the Yellowstone. The Bannocks surrounded and fought them all day. After dark, the besieged slipped away, leaving two of their number buried in a snow bank. The Bannocks found their bodies and had a scalp dance that lasted two days.

The murder by Indians of the prominent pioneer John Bozeman near Livingston in March of 1867 stirred a furor among the citizens of Gallatin County and a petition was sent to Governor Meagher for protection. In response, Fort Ellis was built near the town of Bozeman during the summer of the same year. Fort Ellis, built first by the territorial volunteers as "Fort Elizabeth Meagher," was later taken over by the U. S. Army 2nd Cavalry and renamed Fort Ellis for Augustus Van Horne Ellis, killed at Gettysburg. Occasional depredations by the Indians continued during succeeding years, mostly from the Sioux and Blackfoot. However, with the building of Fort Ellis and the arrival of an increasing number of settlers, the threat of hostile Indians diminished.

After the Custer Massacre in 1876, the Sioux were removed to their reservations and eliminated as a threat in the Upper Yellowstone. With the exception of the Nez Perce flight through Yellowstone Park in 1887,
hostilities from Indians terminated in the valley and the settlers turned to peaceful pursuits.
CHAPTER III

THE SITES

A total of forty-seven sites was found in Park, Gallatin, and Sweetgrass Counties of South-Central Montana during this survey. Sites were usually located on level grass covered terraces at the mouths of canyons where water from springs and streams was plentiful and game animals abounded.

Topography may give valuable insights into past economies and ways of life, and in the vicinity of Emigrant, Montana, basalt terraces, planed by Pinedale glaciation, provided excellent natural gathering basins and cliffs for bison drives. Glaciation, however, left soil that today remains untillable in many locations. Nevertheless, abundant grasses for game animals are present at all elevations from the Yellowstone River bottoms to the alpine meadows high in the mountains.

Although the sample of sites from the Upper Yellowstone is small, and I was not able to follow numerous leads because of a lack of time, the evidence reveals intermittent occupation during the Early Prehistoric Period and continual occupation throughout the Middle Prehistoric and Late Prehistoric Periods. The gradual intensification of this occupation becomes apparent in the increasing size of the sites as these periods progressed, and in the increasing number of typable projectile points from the high ridges in the mountains, suggesting that early hunters skirted the Pinedale valley glaciers in their occupation of glaciated areas. However, occasional projectile points from the Early Prehistoric Period have been found at lower elevations in unglaciated areas.
When the survey commenced, the problem of field procedures arose and we decided that a sampling of sites from different drainages of the Yellowstone would be more fruitful for a preliminary survey than an intensive survey within a smaller area. This decision was further prompted by our receipt of information that sites throughout the thesis area were threatened with complete destruction by relic hunters. Therefore, the majority of sites examined were in easily accessible locations.

Sites were described according to major surface features and designated bison drive sites, tipi rings, wickiups, pictographs and burials. Sites tested for subsurface components included the Eagle Creek Site (24PA301), the Carbella Bridge Site (24PA302), and two bison drive sites (Arthur 1962) located near Emigrant, Montana.

Sites Tested by Excavation

The Eagle Creek Site (24PA301)

High above the town of Gardiner, Montana, and to the north, is a steep basin bisected by Eagle Creek. The ruggedness of the basin and the surrounding countryside results from former glaciations, the most recent of which was the Pinedale, occurring between 8,000 and 12,000 years ago. Eagle Creek drops sharply southward and makes its confluence with the Yellowstone River at the town of Gardiner, where the Gardiner River also junctures with the Yellowstone (Figure 1). To the south, rolling hills rise sharply within the boundary of Yellowstone Park toward Mammoth Hot Springs. The area, therefore, is a point for divergent
movements eastward and southward into different areas of the Park, and a convergent point for groups emerging northward from the Park.

Eagle Creek lies within the territory of several historic tribes that include the Crow, Shoshoni, Bannock, and Blackfoot. The Sheepeater Cliffs are less than five miles southward and the important Bannock Trail crosses Yellowstone Park about five miles south of the site.

The site, according to local informants, lies near the "High Trail" above the Yellowstone River. Using this easily traversed trail, Indians and early day trappers avoided sixteen miles of the steep and often treacherous Yankee Jim Canyon in their movements between the Gardiner vicinity and Paradise Valley north of the Park. The trail ran north and south and moved from Gardiner to the head of Eagle Creek where it continued north and emerged at Sheep Creek, a small drainage several miles south of Sixmile Creek (Figure 1).

The Eagle Creek drainage and other drainages eastward and southward into the Park were inhabited by large elk herds until recent years. Movements of elk from the Lamar River Valley during the late fall and winter into the vicinity of Gardiner made this area outside the Park a prime area for modern day hunting. Historic evidence also indicates that mountain sheep herds also favored this area.

The Eagle Creek Site (Approximate elevation 6,250 feet) is located about two miles northeast of Gardiner along the banks of Eagle Creek. The site is situated on a gently sloping terrace that levels off at the south end of the site where it remains marshy and wet until the month of August. In mute testimony of cooperation between the National Park
Service and the Forest Service, an elk pen (removed in 1962) stood on the north end of the site for the capture and removal of elk to other parts of the state.

During the past twenty-five years the site has provided a source of garden soil for Gardiner residents. Consequently, a substantial portion of the site was destroyed (Figure 3). In spite of extensive depredations, parts of the site remain undisturbed for archaeological investigation. In 1962, the site was declared an antiquity by the Department of Agriculture and removed from public destruction under the Federal Antiquities Act of 1906. This extensive stratified campsite is important in that it sheds light on the sequence of prehistoric occupations in the Upper Yellowstone.

Preparations for excavation included use of the former base line and datum point used by Mr. Aubrey Haines and members of the Bozeman Archaeological Society in an earlier preliminary examination of the site (Figure 3). Since most of the central site area had been removed for garden dirt, an intensive search of the borrow pit was undertaken. This rewarding venture garnered thirteen potsherds within a limited area of the pit, two projectile points, three thumb scrapers, numerous chips, and bone. During preparation of an excavation face, which required removal of several cubic yards of disturbed soil, the basal portions of a Hanna point and a quartzite indented base lanceolate point (Type V) were recovered. These finds correlated with numerous Middle Prehistoric Period projectile points (McKean, Hanna, and corner-notched points found earlier in the site by collectors.)
The site consists of four occupation levels. Based on the typological dating of projectile points found on the surface in the borrow pit, the lowermost and earliest level occurred prior to 3,000 years ago. A stone lined hearth in this level (Occupation Level IV) contained no datable organic material and no associated artifacts were found. The hearth rested in soil immediately above gravels believed to be of Pinedale glacial origin (Appendix A, Horizon C2).

Separating Level IV from Level III was a thick sterile layer of very fine sandy loam (Appendix A, Horizon C1) that varied from eight to twenty-four inches in thickness (Figure 4, Soil Level 7). Occupation Level III was correlated with soil level 6 (Figure 4) and consisted of dark grey loam (Appendix A, Horizon B3). Cultural material in the form of jasper and obsidian chips were present throughout the level, but no diagnostic artifacts were found during our tests of the site. A sunken hearth covered with stones was found in the upper part of this level, but the hearth is correlated with occupation Level II (Figure 4, Level 5). Charcoal from the hearth was submitted for radiocarbon analysis and yielded a date of A.D. 720 ± 160 years (Roy Chatters, 1965, written communication to Arthur, Radiocarbon Dating Lab, Washington State University, WSU sample No. 369). Artifacts from occupation Level II consisted of two corner-notched points (Type XIII), an un-notched triangular blade or point (Figure 23, f), a side scraper, assorted chips, and both fragmented and unbroken bones. A lens of pea gravel (Figure 4, Level 4), suggests rapid flooding of the site, probably during the spring of the year.
FIGURE 4
EAGLE CREEK SITE 24 PA 301
NORTH-SOUTH PROFILE
NORTH 485' WEST 35'
Except for occasional lenses of pea gravel, occupation Level I (Figure 4, Level 3) was superimposed directly above Occupation Level II. Level I produced one small obsidian side-notched projectile point (Type XXII), numerous chips, bones and two in situ potsherds. The two sherds are believed to be from the same pot as the thirteen surface recovered sherds. Two rim sherds and one basal sherd (Figure 22, a-b) indicate the vessel to be of the type described by Mulloy (1958) as Intermountain Tradition pottery.

The presence of surface recovered lanceolate points such as Type V (Figure 17), and McKean and Hanna points that were not recovered in the limited excavation indicates an antiquity for the site extending back to the Early Middle Prehistoric Period and possibly earlier. Whether these specimens are related to occupation Levels III and IV remains to be determined through subsequent excavation. However, the presence of man at the site appears to have been occasional and probably seasonal during dry periods that alternated with occasional wet periods when flooding made the site uninhabitable.

The Carbella Site (24PA302)

Because of its favorable geographic location in the Upper Yellowstone River drainage, the Carbella Site presents significant evidence of the Middle Prehistoric Period and perhaps earlier occupation. The site is situated at the mouth of Yankee Jim Canyon where the Yellowstone River emerges for the first time into a valley extension of the Northwestern Plains (Figure 5). Importance of the site to its former inhabitants is further enhanced by its location at the mouth of the Tom Miner Basin, a
Figure 5. The Carbell Site (24PA302) Facing southwest on site.
glaciated locale that provided easy access to the Gallatin River drainage to the west.

The geologic relationships of the surrounding area to the site are significant although they are not fully understood at the present time. Both Yankee Jim Canyon and Tom Miner Basin were covered with Pinedale ice sometime between 8,000 and 12,000 years ago; therefore, the site could not have been occupied prior to retreat of the ice. However, a Scottsbluff point from site 24PA329 suggests occupation of the lower slopes of Tom Miner Basin during the final retreat of Pinedale ice, and occupation of the Carbella site could have begun soon after the ice had disappeared from the mouths of Yankee Jim Canyon and Tom Miner Basin.

Significant to the understanding of events at the Carbella Site was another geologic occurrence in the form of a large land slide in Yankee Jim Canyon about two miles upriver from the site. The slide dammed the river and formed a narrow lake in the canyon that extended upriver for a distance of nearly fifteen miles to the vicinity of Gardiner, Montana. The lake is believed to have been short lived, but the time when the slide occurred and the later dam failure remains unknown. However, a hearth was found buried in the lake silts near Corwin Springs (Rigler Bluffs Site, 24PA401, Haines 1962:mss) from which charcoal radiocarbon dated between 3,238 and 2,638 B.C. That the hearth was buried under at least eight feet of lake silts indicates that it was made when the lake was rising. This suggests that the slide occurred just prior to the occupation of this site.
The Carbella site is located on the primary terrace above the Yellowstone River. This terrace was a former flood plain during spring runoffs, and prior to excavation of the site in 1963, the river crested within four feet of the terrace level.

Much of the site was disturbed by local artifact collectors so that excavation was essentially a salvage operation in one small undisturbed portion that had been covered with the spoil dirt of illicit digging.

A U. S. Geological Survey section marker (el. 4992 ft.) located on the site served as a permanent datum point and reference for mapping. From the section marker, we established a base line along a magnetic north heading that was then bisected with a line heading east to the area of excavation. The area to be excavated was staked off into five-foot squares. Our working face, oriented on a north-south axis, began several feet in from the river bank and was excavated down to a depth of five feet. Excavation then proceeded westward into the bank (Figure 6).

Large glacial boulders were scattered throughout the site, often protruding through all levels. Three soil levels were determined, above the glacial boulders. The lowest level (Level 3) was comprised of highly consolidated clay and gravel. The upper six inches of this level contained occasional artifacts. The contact zone between Level 3 and Level 2 was difficult to ascertain because of blending of the two levels. Level 2 was composed of loosely consolidated sand and gravel. This level contained nearly all of the artifacts and bone material from the site. Level 1 consisted of light colored sand that contained a few chips but
FIGURE 6
CARBELLA BRIDGE SITE 24 PA 302
NORTH-SOUTH PROFILE
NORTH 150' WEST 42

LEGEND

- SAND
- LOOSELY CONSOLIDATED SAND & GRAVEL
- HIGHLY CONSOLIDATED SAND & GRAVEL
- GLACIAL BOULDERS & GRAVEL
- GLACIAL BOULDERS

ONE FOOT
no diagnostic artifacts. The contact zone between Levels I and II at the edge of the excavated pit contained part of a disturbed hearth contaminated with surface soils from the illicit digging of collectors.

The fact that the artifacts and bones in Levels II and III were positioned at all angles among the cobbles and were often found underneath and between the large glacial boulders indicates that disturbance of the sands and gravels took place as a result of seasonal flooding. Also, dam failure of the landslide one mile upriver very likely affected the site.

Recovered artifacts were made from local cryptocrystalline silicas found at higher elevations in Tom Miner Basin and from Yellowstone Park obsidian. Although occasional small glaciated pebbles of obsidian are found in Yankee Jim Canyon, the primary source of obsidian was Yellowstone Park.

The presence of lanceolate projectile points closely resembling Angostura points and mixed with side-notched points that very closely resemble specimens from the Hill and Simonsen Sites of the Logan Creek Complex presents interesting problems in view of the past tendency to lump all side-notched points into the Late Prehistoric Period.

The fact that intensive occupation of the site terminated at the end of the Middle Prehistoric Period indicates a shift in the hunting patterns of Paradise Valley occupants at that time. Based on projectile point types, use of the Small Emigrant Bison Kill (24PA309) ten miles downriver from Carbella is believed to have begun about the time of Christ and therefore, may represent a population shift toward the plains and bison hunting, and away from a primary dependence on other big game animals in the mountains.
Bison Drives

Many names have been ascribed to those sites where the accumulated bones of bison have been found. Such sites have been referred to as "kills, drives, jumps, piskins (Blackfoot), traps, pens, pounds, falls, parks, corrals, and surrounds" (Ewers 1949:355), with many people lumping all of them into the stereotyped image of the spectacular bison drive, the "buffalo jump". Although buffalo jumps represent only one specific type of bison kill site, they are of primary concern in this study since they are the most common type found in the Upper Yellowstone Valley.

Buffalo jumps generally consist of several parts that include a gathering basin or grazing area in the vicinity of the jump where first contact was made with the buffalo. From there, the animals were gradually lured into a wide lane (drive lane) delineated by small rock piles placed at intervals (drive lines) usually in the shape of a large "V" on the gently rolling foothills of the Plains, and converging at the edge of a vertical cliff or steep slope over which the buffalo were driven to their destruction. Often, below the cliff, a steep talus slope extended to the base of a plateau or terrace. The fall from the cliff onto the talus slope and the tumble to the terrace below was sufficient to kill or maim the animals and they were dispatched with little difficulty.

For purposes of discussion, Schaeffer (1962:30-31) divides the drive complex into two phases: (1) the drive ritual that varied somewhat among the different plains tribes, and (2) the drive procedures proper. According to Schaeffer (ibid) the Blackfeet drive ritual apparently
centered about the *iniskim* or so-called "buffalo stone". The *iniskim* is a marine fossil found on the Blackfeet Reservation and elsewhere in Eastern Montana. Its fancied resemblance to an animal probably led to its use among the Blackfeet as a magical charm to lure buffalo. The ritual consisted of songs and possibly imitative dances carried out the night before the drive to insure the safety and success of the runner, whose task was to locate the herd, and put it into motion toward the drive lanes.

Blackfeet drive procedures were described briefly by Wissler (1910:37):

When conditions seemed favorable, he (the watcher) ordered all the young, able-bodied men, out to the lines where they took their stations behind the rock piles, concealing themselves under blankets or newly cut branches. Then, if the buffalo drifted into the wide entrance to the lines, the outlying men began to stampede them as they moved forward, the men concealed on their flanks arose shouting, waving blankets or brush, so as to keep them headed down the chute and to increase their fright. When near the brink, the leading buffalo attempted to stop and turn aside. Here the number of men was greatest and the danger of being run down considerable; but the pressure of the frightened buffalo in the rear, and the demonstrations of the men near the brink, were usually effective in forcing over the leaders whence the whole bunch followed blindly.

Other types of bison kills utilized narrow defiles and box canyons into which the bison were driven. Concentrations of animals in these locations made them easy prey. A related type utilized swales and valleys down which the bison were driven into bogs, ponds, streams and man-made compounds. Less commonly known kills took advantage of winter conditions and the bison were either driven onto ice where they were helpless, or were crowded into deep snowbanks where they floundered and became easy victims of awaiting hunters.
These methods of taking buffalo persisted into late prehistoric times and probably into historic times when fortuitous circumstances warranted their use. This point was illustrated by Medicine Crow (1962:35) when he stated:

When the Crows seceded from their ancestral tribe someplace in North Dakota, and started up the Missouri and up the Yellowstone they traveled leisurely on foot with their dogs. They brought with them a number of techniques for capturing animals, such as crowding buffalo into snow banks, surrounds, and even slaughtering buffalo on ice, and they brought also the concept of the buffalo jump.

Related to both the drive ritual and drive procedures was a complex of behavior concerned with the important factor of scent. Since the buffalo had a keen sense of smell, success throughout the drive depended on the scent factor. Such things as orientation of the drive lines and location of the campsite bowed to the demands of odor. Alexander Henry (Schaeffer 1962) mentioned attempts by Indians to bring buffalo herds from the gathering basins into the drive lanes without success because the wind was "contrary or unfavorable".

From his work among the Blackfeet, Schaeffer (1962) stressed the importance of the scent factor in Blackfeet bison drives by saying:

In the foothill country around Browning, the wind is predominately from the west southwest. And archaeologists working in drive sites here would have to keep this point in mind, since it had an important influence in the location and orientation of the drive site. In other words, the runner and any of the hunters taking part in the drive would have to insure that their body odor was not carried downwind to the approaching herd. This was taken care of in most occasions by the proper orientation of the stone wings and the fall.

For this reason, a famous runner of Blackfeet tradition, Red Antelope, "took particular care of his outfit, rolling it up with
sweetgrass after use and depositing it in a secret place some distance away to avoid contamination with camp odors" (Schaeffer 1962:32).

Other tribes were cognizant of the bison's reaction to strange odors, and Clark Wissler states that:

> The Oglala Sioux in the early contact period killed any tribesmen and his horse discovered going among whites, as they were afraid that the smell of coffee and bacon (foreign smells) would scare the buffalo and make them stay away. However, they would allow the white traders to come and bring merchandise but would not buy any foods that created a peculiar smell" (Schaeffer 1962:28).

Buffalo jumps represent a cultural phenomenon peculiar to the Northern Great Plains and the eastern foothill slopes of the Rocky Mountains. According to Forbis (1962:40), they extend as far north as Red Deer River between Calgary and Edmonton, Alberta, then northeastward perhaps to the North Saskatchewan River, southward into Manitoba and from there southward into the Dakotas. Along the eastern Rocky Mountain slopes they appear in southern Alberta, Montana, Wyoming, and Colorado. They have not been found in the Central and Southern Plains. Montana, however, is conceded to be the center for buffalo jumps since most of them are found there.

Although other kinds of bison kills may have preceded them, buffalo jumps date back from historic times into a respectable antiquity. Kehoe and McCorquodale (1961) have recovered a specific type of side-notched point called Avonlea from a level in a buffalo jump in Alberta with a radiocarbon date of A.D. 460. According to Forbis (1960:66), one of the lower levels of the Old Women's Jump in Alberta, radiocarbon dated at 1,840 ± 70 years ago (A.D. 126 ± 70). Forbis (1960:66) further stated
that "Wettlaufer conservatively estimated the earliest occupation of a jump at Ft. Macleod, Alberta, at 3,000 years before present." Should this estimate prove correct, it would represent a use of jumps about 1,500 years before the beginning of Mulloy's Late Plains Period, which is the generally assumed date for the beginning of buffalo jumps. This would place the technique of buffalo jumps well back into Mulloy's Middle Prehistoric Period.

The Upper Yellowstone Valley

In the Upper Yellowstone Valley, we located ten possible bison kills, and thirteen more were found in adjoining areas. Of the ten kill sites, only two, 24PA309 (Small Emigrant Kill) and 24PA307 (Conlin Kill), fall outside the category of buffalo jumps.

The Small Emigrant Kill (24PA309) located near Fridley Creek, two miles south of Emigrant, Montana, contains a compound that measures 120 feet wide and extends 150 feet out from the base of the low cliff. The visible stone piles encircling the compound are low and scattered and may have supported posts. Apparently, buffalo were impounded by driving them over a low cliff into an enclosure.

The Conlin Kill (24PA307), found on Emigrant Creek near a ghost town (Yellowstone City) lies at the base of a low sloping cut bank. Although no evidence of a corral now exists at the base of the kill, one probably existed since the cut bank is about ten feet high and slopes downhill at a forty-five degree angle. The compact area containing the deposits also suggests this possibility. An estimated 4,000 projectile points were removed from the site during the 1930's by a Livingston curio
dealer with a hired crew of men. Only one line of rock piles leading to the bank is discernible. The individual rock piles consist of five to ten stones spaced at intervals of about thirty feet on the edge of a long swale. Buffalo were driven north from a large grazing area on the foothills of Emigrant Peak.

Projectile points, reportedly from the site, were very similar to those from 24PA309 and included triangular shaped points of both corner and side-notched varieties with side-notched types predominating.

The remaining eight kills belong in the category of buffalo jumps. All of them have at least one line of rocks leading to the cliff, although they seldom conform to the classic "V" shape since the terrain was utilized to maximum advantage to drive the animals to the jump-off. The height of the cliffs for these eight kills varies from fifteen to about twenty-five feet, and the talus slopes below the cliffs, at sites where they are found, often extend downward from the base of the cliff to the terrace for a distance of over 100 feet.

Emigrant Bison Drives

Perhaps the most interesting sites in the Upper Yellowstone Valley are two Bison Drives located two miles south of Emigrant, Montana. They are situated within a quarter mile of each other on the same glacially planed basalt terrace.

The larger drive (24PA308) is a scene of scattered boulders on a steep talus slope ascending to a vertical cliff about fifteen feet high (Figure 7). Converging at the cliff edge, rock piles, about two feet high and spaced about six feet apart, spread out in a large "V" across
Figure 7. Emigrant Buffalo Jump (24PA308). Facing north on "jump-off" cliff.
the flat. Although wooden posts have been recorded at other bison sites in the eastern United States there is no evidence that wooden posts were used at any of the bison kills in the Upper Yellowstone Valley. The approaches to the jump from the gathering basin are somewhat novel at this site. Rather than a level flat leading to the jump, the drive lane is divided by rock out-crops into several wide lanes channeling buffalo to the cliff.

At the base of the jump, the bone deposit covers an area which is approximately 150 by 200 feet. According to Barnum Brown (1932:80), the few undisturbed portions of the site which he excavated contained bones to a depth of fourteen inches. Mr. Charles A. Kinsey, of Belgrade, Montana who dug in the site during the 1930's found accumulations of bone deposits to a depth of thirty inches with a quantity of buffalo hair at the bottom.

Deposits consist of artifacts, ash, grass roots, decomposing horn cores, occasional small paper thin pieces of unburned buffalo hide, often with the hair on them, and bones. As a result of burning and rot the bones are broken into small black and gray slivers. Lack of discernible stratigraphy indicates frequent and probably repeated use of the jump during the fall of the year. However, a massive single drive might also account for the deposits. Buffalo and other large game animals reportedly moved from higher summer ranges in Yellowstone Park down into the valley in the 1870's and 1880's. The Crow Indians hunted them with rifles in the fall but without employing buffalo jumps.

A paucity of knives in the artifact assemblage from both drives cast doubt that butchering was actually done there, and excavations at
other bison drives have yielded similar results. Perhaps knives were carried away with the meat while projectile points were left behind as expendable.

Projectile points from the large drive consist almost entirely of side notched types reported in use by late plains buffalo hunters. Of sixty-six points examined from the site, forty-five are made from obsidian. With one exception they are side notched and averaged less than an inch in length.

Although numerous people have dug in this site, no one has reported the presence of iron points or other evidence of white contact. Brown (1932:82) estimated the age of the jump at "Probably not more than 300 years." He based his conclusion on the fact that the bison were of the living species, and that several implements were found on the campsites by other people, "among them a steatite bowl of the kind used by the Shoshoni Indians, but not by the Blackfoot tribe who recently inhabited this region" (Brown 1932:81).

Another less imposing bison drive (24PA309) is located a quarter mile west of the large drive on the border of the same lava flow. Drive lines leading to the larger kill cross over the drive lines leading to this small kill, indicating that the large drive was used later than the small kill. The often indiscernible drive lines leading to the small jump indicate that buffalo approached the compound from the northwest. By driving animals from this direction the Indians were able to use certain natural barriers. A more westward approach would have involved an abrupt turn of almost ninety degrees within 100 feet of the jump. The
few discernible rock piles which form the west drive line suggest that the northwest approach was most likely (Arthur 1962).

Below the cliff a large central part of the compound has been dug by collectors, and the deposits heaped into high piles which were littered with burned and rotted bones. Bone concentrations appear heaviest in the center of the compound, continue in an eastward path and extend outside the compound for about fifty feet. Fire-blackened and heat-fractured rocks mixed with charcoal and bones in the dirt heaps outside the compound suggest that cooking was done in the immediate vicinity of the compound. Excavation of this site revealed that bones and artifacts extended from the ground surface to a depth of fifteen inches, but we were not able to determine any stratigraphic sequence. Soil disturbance resulted from the growth of natural vegetation such as sage brush, grass, weeds and also from rodent activity.

From 24PA309, 275 complete and broken artifacts were recovered. Of these, 100 were projectile points and 169 were pieces presumed to be projectile points. During our excavation two cores and a few chips were recovered. This suggests that some tool manufacturing was done at the compound. Several knife fragments were found indicating that some butchering might have been done inside the compound, whereas a complete lack of scrapers suggest that hide dressing was done elsewhere.

One of the most perplexing problems in this study of buffalo jumps is the complete absence of bone deposits at certain jump sites. Construction of rock lines obviously required the energies of many people, and one of the finest examples of stone fences in the valley is found at the
Peterson Jump (24PA334). Here the stone piles are intact and stand one and one-half to two and one-half feet high. Near the cliff the main drive lines were reinforced by additional lines parallel to the main fences. However, bone deposits were completely lacking and we found this to be the case at several other probable jump sites (24PA304, 24PA326, 24PA314).

There is no doubt that all the elements of a buffalo jump are present at these sites except for bone deposits. Several answers advanced to account for this are: (1) that drive lines were constructed for a specific bison herd that moved out of the area before the animals could be lured into the drive lane, (2) the bone deposits washed away and either disappeared or remain to be located away from the jump, (3) that other variables, such as wind direction proved unfavorable and necessitated abandonment of the site.

At the Peterson Jump and at the Merrill Jump the factors of deposition and terrain were considered for the possible washing away of bone deposits. With these considerations in mind, deep cores were removed from every conceivable location near the base of each jump, but all lacked any fragments of bone.

Another problem concerns the firing of bone deposits. At two jump sites (24SW208 and 24GA305), bones were not burned, and at other jump sites, levels of unburned bone were observed. What significance the burning or not burning of bones may eventually have remain highly speculative. Forbis (1960:77) states that:

Burning takes two forms. In both, the bone is generally charred and fragmented. (a) In one case, the resultant ash is white and floury. The colour suggests an oxidizing atmosphere. In the second, the soil is black and often greasy.
It probably burned in a reducing atmosphere, lacking sufficient oxygen for total combustion.

Reference to the horrible stench of rotting carcasses by observers such as Lewis and Clark (1904:Vol. 2, Pt. 1, p. 96) and Alexander Henry (Schaeffer 1962) might indicate that stench was sufficient reason for firing the bones. Brown (1932:80) mentions that the burning of accumulated carcasses was evident at the Large Emigrant Jump (24PA308) to prevent the stench "which would have caused the animals to balk and refuse the plunge." At the Emigrant kills the wind direction changes often so that the scent factor could assume considerable importance at this site.

For the Old Women's Jump Forbis (1960:77) speculates that since:

... the burned layers originally consisted of decomposed hair, hide and bones of the buffalo ... strongly resembles peat and burns with a punky flame ... It seems probable that a grass fire could ignite the material and that, once ignited, it would continue to burn, although not in places where it was mixed with so much soil that the flame was smothered.

H. P. Lewis (MSS. Chapter III) concluded that burning was probably due to natural causes. Although it is agreed that sanitation would be a doubtful factor in firing the bones; the scent factor assumes importance when changing wind direction is considered. Apparently wind direction did change according to the Fidler Journal, and the Indians left if the stench reached the camp (Forbis 1960:77). Important, as well, is a previous reference to Alexander Henry's observation that when the wind was "contrary" or "unfavorable" the Indians failed to bring the buffalo into the drive lanes.

Within the thesis area buffalo jumps are found in most of the large mountain valleys adjacent to the high plains proper. However, we
found none higher in the mountains where the valleys became narrow and the necessary components for successful drives were not present. For example, no drive sites were positively identified in Yellowstone Park, although a reported drive site inside the Park boundary at Gardiner was superficially examined with inconclusive results.

Buffalo jumps range geographically from the Big Hole Basin in Beaverhead County, Montana, northeastward into the Jefferson, Madison, Gallatin and Yellowstone Valleys, spreading northward and eastward over the plains.

As yet no buffalo jumps or other bison drive sites have been found in Western Montana. In late prehistoric and historic times, tribes from west of the continental divide in Montana and from Idaho ventured east of the divide and onto the plains to hunt buffalo. The Kutenai and especially the Upper Kutenai went on annual bison hunts to the Plains, and although buffalo jumps are mentioned in their folklore, they deny that they used this method in pre-horse days (Turney-High 1941:36). The Flathead generally had two bison hunts, a brief hunt in the summer to obtain hides in which usually they went no farther east than Helena, Montana, and the great winter hunt to the Musselshell, and the valley of the Yellowstone (Turney-High 1937:116-117). Bon Whealdon (pers. Comm. to M.G. Burlingame) states that a Flathead named Francois Skyema "in his youth, had gone on buffalo hunts in the Judith Basin country."

According to Turney-High (1937:115), "The Flathead maintain that they had never heard of the practice of driving bison over cliffs or into pounds, and that such practices were not theirs in pre-horse days."
The Shoshoni, however, were adept in the techniques of communal drives and used corrals to capture antelope (Steward 1938:205). However, Steward (1937:191) states that on buffalo hunting trips to the Yellowstone during the historic period, Shoshoni and Bannocks "did not surround, impound, or drive them (buffalo) over cliffs." However, the Shoshoni had sufficient social organization and knowledge to communally hunt and drive antelope into corrals so that in prehistoric times, they could have driven buffalo over cliffs and probably did so.

The eastern portion of the Yellowstone country has long been inhabited by peoples whose life-way was based to a large degree on the buffalo. Among the historic tribes, the Shoshoni occupied the Upper Yellowstone country including the National Park, and they are said to have extended their occupation east to the Big Horn Mountains or beyond (Teit 1930:304). According to Teit, the Flathead knew of no tribes to the south, both east and west of the Rockies, that were not branches of the "Snake". Most of these people depended chiefly on hunting buffalo, elk, and mountain sheep.

Farther north Shoshonean bands occupied the country around Livingston, Lewistown, and Denton. How far east and down the Yellowstone they extended is not known; but they are thought to have at one time held the country around Billings, and most, if not all of the country where the Crow Indians now have a reservation (Teit 1930:305).

Later, after horses were obtained, other Shoshoni bands from Idaho made regular visits to the buffalo country east of the mountains, sometimes joining with other Shoshoni bands living east of the range and sometimes hunting by themselves. On these trips they skirted the mountains on the western side and then crossed into Yellowstone Park, from there moving east and north.
Others crossed the Rockies by passes farther north, and skirting the eastern foothills to the Gallatin Range went north on both sides of it to Livingston and beyond. Some of them went to the Musselshell River, and occasionally as far as Lewistown and Fort Benton; but it seems they did not cross the Missouri (Teit 1930:305).

By 1810, Blackfoot penetration from the north had pushed the Shoshoni into Idaho and forced them, on their annual bison hunts to the plains, after 1840, to join for protection with the Bannock, Nez Perce, Coeur d'Alene, Flatheads, and sometimes with the Crow.

Somewhat earlier, the movement of the Crow into the Yellowstone Valley occasioned friction with the Shoshoni. Nevertheless, their relations appear generally to have been friendly.

The Crow are believed to have formed part of the Hidatsa group from whom they separated in fairly recent times. This separation, according to tradition, probably occurred about A.D. 1776 (Mulloy 1942:101). In the same reference Mulloy points out that:

The material culture at the Hagen Site on the Lower Yellowstone is obviously similar to that of the Mandan-Hidatsa-Crow group. There are more obvious evidences of relationships in this direction than any other.

Since the Mandan and Hidatsa were horticulturalists, a split between them and the Crow about A.D. 1776 would mean that the Crow had to rapidly slough off a horticultural economy and adopt a full blown horse-buffalo economy within a very short period of time. However, on the strength of Crow legends, Medicine Crow (1962:47) states that the Crow came up the Yellowstone River about A.D. 1600. This would have allowed them more time to make the transition in their basic economy.

According to Medicine Crow (1962:47) a favorite buffalo jump and one of the earliest used by the Crow in the Upper Yellowstone is located
near Livingston, Montana. Known as the "Long Ridge Jump":

It faced east toward the Yellowstone River. The runners got on top of the mountain and brought down elk, deer and even rabbits, along with the buffalo. The drives down a mountain side brought in all types of animals that might get in the way, but on the prairie just the buffalo herd was brought in. This jump was a popular one and was probably one of the first the Crows used as they came up the Yellowstone River. It was where this river comes out of the mountains. By the time the Crows got here, about A.D. 1600, they started using some of the early jumps.

The site referred to by Mr. Medicine Crow is believed to be the Livingston Jump (24PA313) and may include 24PA319. Both sites are located on the southwest outskirts of Livingston.

Other tribes occasionally inhabiting the Upper Yellowstone may have used the buffalo jumps located in the area. Cheyenne and Sioux certainly penetrated the Upper Yellowstone in early historic times and perhaps used them in the Late Prehistoric period. The Kiowa, the legendary occupants of the Upper Yellowstone, may also have used them when we view the present uncertainties of our knowledge of former occupancy of the Upper Yellowstone.

**Wickiups**

Those structures herein referred to as wickiups have been recorded previously as "stick lodges" by Lewis and Clark (Thwaites 1904), "wickiups, brush-heaps, or skin covered lodges" (Norris 1882:605), "war houses" (Schultz 1907:411), "conical hunting lodge (midi-stihe)" (Wilson 1934:411), "war lodges" (Ewers 1944:182; Quaife 1926:112-113), and by most writers as "tapis". This list includes only the more common names ascribed to these structures.
The term wickiup is used in preference to war lodge and hunting lodge since these terms signify a specific use that cannot be applied to all such structures.

Wickiups may be described as conical pole structures similar to the Plains Indian "tipi" or skin covered pole lodge, but generally smaller in size and with the poles placed very close together or "so closely laid that no glimmer of a fire could shine through them" (Schultz 1907: 53). Poles vary from an inch to a foot in diameter and range up to twenty-five feet in length. According to Lewis and Clark (Thwaites 1904, Vol. I:367) the diameter of these structures was "... ten twelve or 14 feet..." Details of construction have been described by Lewis and Clark (Thwaites 1904:367-368) and later writers (Will 1909; Wilson 1934; and Ewers 1944).

Although there seems to be considerable variation in the minor details of construction of wickiups among the various tribes who built them, they are to be distinguished from other possibly related phenomena such as circular, horizontally cribbed log structures without roofs used as fortifications, or reported rectangular log structures built in winter by the Crow (Mulloy 1952), or sweat lodges.

Wickiups are common over the Northern Plains, the Intermountain region or southwestern Montana (east of the Continental Divide), in Wyoming, and in southern Idaho. Evidence places them as far east as North Dakota (Bismarck Tribune, March 7, 1961), and Lewis and Clark (Thwaites 1904) mentioned them numerous times among the "Minnetares" or

Wickiups were constructed by a majority of the historic tribes in Montana that included the Plains Cree, Crow, Sioux, Gros Ventre, and Assiniboine (Ewers 1944:190), and the Cheyenne, Hidatsa, Mandan, Arikara, Arapaho, Shoshone, Flathead and Nez Perce (Voget n.d.:70). Ewers' informants, however, had never heard of the Flathead making wickiups. Teit (1927:62) on the other hand, wrote with reference to the Flathead and Kalispell:

... families who happened to stay in the mountains longer than expected and who were not provided with skin tents and mats, made conical lodges of poles covered with brush, pieces of bark or grass and further covered with earth to a depth of a few inches on the outside. (Teit 1930:62).

It is uncertain whether the Kutenai and Pend O'Reille made wickiups but possibly related rectangular house-like forts were built by some of the Plateau tribes (Ewers 1944).

Ewers (1944:191) suggests a Northern Woodlands influence for wickiups among the Northwestern Plains tribes. Whether this possible influence might be extrapolated to include Shoshoni wickiups remains to be determined.

The Blackfoot "war lodge" as described by Ewers (1944) differed from other wickiup structures of the Plains and Intermountain Region by addition of a:

... low angling, covered entrance-way, composed of rather heavy forked tree trunks. The triangular passage thus formed was barely four feet high, making it necessary for a man to stoop low to enter the lodge (Ewers 1944:184).
Other innovations that appear in eastern Montana wickiups were the use of a central supporting tree, and the use of logs (Ewers 1944), and vertical stone slabs (Mulloy 1952) piled around the exterior peripheries of many wickiups.

Although details of wickiup construction appears to have varied among tribes, Ewers (1944) gives an excellent description of the cooperative effort among the Blackfeet:

When erecting a lodge in the lower altitudes three or four heavy, forked trunks of cottonwood were locked together at the top to form the foundation. Their tops were not tied. These timbers were about 12 feet long for the average sized lodge, which had an inside height of about 7 feet. The butt ends of the pieces rested on top of the ground held in place by their weight. Then lighter red willow poles were leaned against the three stout foundation timbers at their top intersections to complete the steep sided conical framework. The poles were set somewhat closer together than in the common skin-covered lodge. This framework was generally covered with long slabs of bark, stripped from large cottonwoods, and leaned on end over the outer side of the poles. The bark slabs either overlapped or were set close enough together to make the sides of the lodge virtually waterproof. As this part of the work progressed, the leader went inside the lodge and pointed out to his men working outside the spaces that remained to be covered to make the lodge weather tight. Sometimes brush was used instead of bark for the cover. It was not tied to the poles, but simply leaned against the framework as in the case of the brush walls of the Blackfoot medicine lodge. The bark cover was usually preferred. It was more difficult to make the brush cover snow, wind or rain tight. Often sticks were propped against the brush or bark cover from the outside to hold it in place. An inverted-V-shaped opening was left on one side of the circular structure, affording an entrance to the lodge.

For the Upper Yellowstone, perhaps the first written account of wickiups was that of the Cook, Folsom, Peterson exploration of 1869. According to their account of September 12 (Haines 1965:16-17), they were at the mouth of the present Tom Miner Creek at the north end of Yankee Jim Canyon:
Here we found a wickiup inhabited by two old squaws who were engaged in gathering and drying choke-cherries. Everything around them indicated the most abject poverty. Their wickiup was formed by a few poles placed in a circle of not more than eight feet in diameter with their tops interlaced in the usual manner; these were thatched with grass two or three feet from the ground but were open at the top.

Probably the next record of wickiups in the Upper Yellowstone was contained in the Yellowstone Park reports to Washington, D.C., sent by Colonel Philetus Norris, who in 1880 described them as:

... skin covered lodges, or circular brush-heaps called wickiups, decaying evidences of which are abundant ... in nearly all of the sheltered glens and valleys of the Park (Norris 1882: 605).

Norris (1879:10) further assumed that wickiups were constructed by the Tukuarika Shoshone (Tukudika), or more commonly, "Sheepeaters". The Tukudika do not fit the prevailing image of former proud, warlike Indians envisioned as a match for a General Custer, but rather, were considered as timid, humble, people without a worthy mark of distinction. Perhaps the attitude that prevailed toward these mountain dwellers is best summed up by Chittenden (1905:7-9) who said of them:

It was a humble branch of the Shoshonean family which alone is known to have permanently occupied what is now the Yellowstone Park. They were called Tukuarika, or more commonly Sheepeaters. They were found in the Park country at the time of its discovery, and had doubtless long been there. These hermits of the mountains whom the French trappers called "les dignes de pitié", have engaged the sympathy or contempt of explorers since our earliest knowledge of them. Utterly unfit for warlike contention, they seem to have some immunity from their dangerous neighbors by dwelling among the inaccessible fastnesses of the mountains. They were destitute of even savage comforts. Their food, as their name indicates was principally the flesh of the mountain sheep. Their clothing was composed of skins. They had no horses, and were armed only with bows and arrows. They captured
game by driving it into brush enclosures. Their rigorous existence left its mark on their physical stature, and are always described as a 'timid, harmless race'. They may have been longer resident in this region than is commonly supposed, for there was a tradition among them, apparently connected with some remote period of geological disturbance, that most of their race were once destroyed by a terrible convulsion of nature.

Wickiups have been reduced in number by forest fires, weathering, and other destruction, so that within the Park today, only two known and recorded wickiup sites remain, 48YE2, above Lava Creek near Mammoth Hot Springs, and 24YE301, along the edge of Wigwam Creek on the Gallatin drainage in the northwest corner of the Park. One other wickiup site in the Park was referred to by Replogle (1956:47), who mentioned "some on Specimen Ridge above Crystal Creek which have fallen." These were not found by archaeological survey crews who worked in the Park.

The Lava Creek Wickiups, 48YE2, (Hoffman 1961)

These are located on a level terrace 1,100 feet above Lava Creek at the northern end of the Sheepeater Cliffs near the confluence of the Gardiner River with the Yellowstone River. The site contains four wickiups arranged in an arc and surrounded by pine and aspen trees (Figure 8). Two structures remain standing and two have fallen with the poles crossed so that they remain recognizable as wickiups. Examination of the standing structures showed that the bases of the poles were gradually rotting in the moist Park climate, and that they stood much higher when originally constructed. According to Hoffman (1961:36-37):

Present day (July 1958) measurements of standing wickiups 'A' and 'C' show that 'A' has a height of 10 feet and a circular base 8 feet in diameter. Wickiup 'C' has a height of 12 feet and an ellipsoidal base of 6 feet by 10 feet. The wickiup'
Figure 8. Lava Creek Wickiups (4RYE2). Facing northeast on structures.
poles are quite close together and suggest that only a super­ficial cover of brush or grass (if any cover) was used to finish the structures . . . . The center of each wickiup floor (standing and fallen) has been dug out by unknown persons. However, stones and charcoal still left inside the wickiups reveal the presence of true hearths (Figures 8 and 9).

Several large pieces of elk bone consisting of femur, vertebrae and scapula were recovered from inside the wickiups. Small amounts of obsidian spallings and a chert thumb scraper were found twenty-five yards north of the structures.

The Wigwam Wickiups, 24YE301

These three wickiups are found in a narrow draw about seven-tenths of a mile east of U.S. Highway 191 along Wigwam Creek. This creek flows into the Gallatin River near the Park's boundary with Gallatin County, Montana. Two of the wickiups have fallen, with the eastern most one smashed by a falling aspen tree. The western one has also been downed by a falling tree, and the remaining one is threatened in a similar way.

Examination of the standing wickiup shows that it is composed of about 120 aspen poles, four of which appear to have been cut with a steel axe. The poles average about three inches in diameter at mid­length, but are larger at the bases which have rotted considerably, thus reducing the height and diameter of the original structure. The present height of the standing wickiup is about nine feet at the point where the poles cross, and the floor diameter is about ten feet.

According to Lew Napton (Pers. Comm.) who excavated in two of these structures, a hearth was present in the standing wickiup. Excava­tion of the floor yielded only chips of chert, quartzite and obsidian,
LAVA CREEK WICKIUP SITE
48 YE 2

Figure 9.
with no worked tools. Napton also reported a number of large cobbles (five to six inches in diameter) around the northern and western edges inside the structure, possibly to hold down whatever cover was used. It is noted that the steel axe cuts could have occurred at a time later than the original construction of the wickiups. The chippings found at the site indicate use by Indians, although the wickiups could have been used at later times by hunters or others in the area.

That the remains of wickiups, with some of them in an upright position continue to exist, attests to their historic recency. Although the actual dates of occupancy are not known for these two sites in the Park, the process of weathering would suggest that they are certainly not more than 150 years old.

Two wickiups have been reported outside the Park and within the defined thesis area. Dominick (1964:163-164) reported one wickiup that he found at a high elevation in the Absaroka Range north of the Park. Another wickiup is located on the property of Mr. Barton Bowles on Deep Creek, south of Livingston, Montana. Other wickiups probably exist in the more remote and secluded areas of the Gallatin Mountains, the Absarokas, and the Beartooth Ranges north of the Park.

During the past several years at least five wickiups have been located in the larger spur mountain ranges of Central Montana. Two structures have been found in the Castle Mountains near Martinsdale, Montana. Another wickiup was reported from the Little Belt Mountains (Conner 1966), and one wickiup was located in the vicinity of Roundup, Montana. However, the most important wickiup site found thus far in
Central Montana was the Evans Site (24CV405), located southeast of Lewistown, Montana, in the Big Snowy Mountains. Excavation of the Evans Site was carried out by the Billings Archaeological Society. The site contained a central fire place and yielded two white barrel trade beads, and the badly rusted barrel of a muzzle-loading gun. The gun barrel was eventually determined to be a Northwest Company gun traded to Indians between 1820 and 1840. Dendrodates on wood cores from the wickiup indicated that it was built no later than 1865. An innovation within the structure was the presence of a bark floor near the doorway of the structure. From the items found in the structure, indications of Indian occupancy prevail. However, there is nothing conclusive to prove this assertion.

In summation, the wickiups found in Yellowstone Park were most likely constructed and first used by Indians as suggested from the stone chips and occasional artifacts found at these sites. Steel axe cuts on certain of the poles are undiagnostic and indicate nothing more than the historic recency of these structures.

Stone Circles and Stone Alignments

Stones arranged in circles and generally referred to as "tipi rings" are common throughout the Northwestern Plains of the United States and Southern Canada, and they extend west of the Rockies into Idaho and the Columbia Plateau. Their geographic distribution conforms generally to that of the skin covered pole lodge known as the Indian "tipi" used by
nomadic buffalo hunting tribes in historic times. In Montana, tipi rings constitute the most frequently found archaeological feature.

The term "tipi ring" appears to have entered the literature because the rings are numerous and most of them conform to the size observed as the perimeter for a lodge, thereby, leading inferentially to the conclusion that they functioned to hold down lodge covers. The term has become misleading since nearly all phenomena where stones are placed in juxtaposition to form arcs and circles are called tipi rings. However, for the sake of convenience, the term will be used in this paper, although association of stone circles with tipis has been established only for a certain area of Northern Montana.

Tipi rings are found singly or in clusters in many different locales. The majority of circles are located on terraces near water courses and often in good camping locations. However, others are found on windswept buttes and ridges at considerable distance from water.

Tipi rings are described as circles formed of cobbles and small boulders found at intervals on the ground in the general shape of a ring or circle. Although many circles consist of a single ring of stones, others contain sufficient stones to suggest a double course or two rings comprising one tipi ring. According to Kehoe (1960:463), the size considered necessary to form a tipi ring varies from about:

... 7 to about 30 feet in diameter (the range ultimately determined by the size range of tipis as this becomes known), averaging about 16 feet, the boulders of the circle being of a size and weight suitable for securing a lodge cover.

Near the center of the ring a few scattered stones forming a possible hearth may or may not be present.
A considerable antiquity for tipi rings appears evident from artifacts found in tipi ring sites in the Shoshone Basin of Wyoming. A comparison of projectile points (corner-notched) and other artifacts from the Shoshone Basin sites with artifacts from several dated sites (Signal Butte and the McKean Site) revealed such close similarities that Mulloy (1954) was led to conclude that tipi rings probably came into use during the Late Middle Period. From most areas, corner-notched points are associated with tipi ring sites, generally with a scanty recovery of artifacts. Malouf (1960) reported corner-notched points associated with tipi rings on a survey between Green River, Wyoming, and Denver, Colorado. Corner-notched points were also found in Montana Western Region tipi ring sites (White 1959). Tipi ring sites from the Upper Yellowstone yielded corner-notched points of the same types that Mulloy reported.

In Northern Montana and Southern Alberta, however, Kehoe (1960) has established that tipi rings were used in historic times. Neuman (1962:270) also reported a source which mentioned that the Omaha tribe could trace their villages by the circles of stone that were left when the people abandoned a village.

Although most archaeologists familiar with tipi rings may generally agree about their antiquity, a divergence of views has been expressed in print concerning their function. Within a limited geographic area, Kehoe (1960) has compiled overwhelming historical and ethnographical evidence that among the Blackfoot in historic times, tipi rings served to hold down the liners and lodge covers of tipis. For the same geographic area, this domestic function finds support in the work of the Milk River Archaeological Society. Davis (Pers. Comm.) reports tipi rings containing
within the circles one or more of the following cultural manifestations: (1) Late Plains side-notched projectile points, (2) pottery, and (3) charcoal from hearths inside the rings. Davis further mentioned that Late Plains side-notched points exclusively were found inside and in association with tipi rings located by the Milk River Archaeological Society.

However, disregarding, as Kehoe (1960) did, other phenomena often related to tipi rings, such as circular cribbed log structures, eagle catches, and slab stone structures, tipi ring sites from the Upper Yellowstone often present features apparently not encountered in Northern Montana.

In the Upper Yellowstone Valley, twelve sites containing stone circles were found. All but two sites were located within three hundred yards of active water courses, intermittent streams, and springs; although four sites contained rings located at very inhospitable locations. Four sites contained rings with either internal or external features of varying complexity. Artifacts were either scant or non-existent at all but one site where thirteen projectile points, and a number of knives and scrapers were found along with hundreds of chips and blanks.

Most of the sites contained those features common among tipi ring sites from other areas. However, seven sites exhibited features unique enough to warrant description.

24PA306.—This site lies on the first terrace above Emigrant Creek almost directly north of the Conlin Buffalo Kill (24PA307) and near the ghost town of Yellowstone City. It consists of twenty-one rings at
present but reportedly contained many more that were destroyed by settling ponds associated with nearby gold dredging operations. The rings range in size from twelve to twenty-two feet in diameter and are scattered over an area of 100 by 300 yards. Artifacts have been collected from the site by the land owner but were not recorded. Although no excavation took place, examination of the stones in the center of several rings revealed that they had been disturbed and no charcoal or ash was observed. A few quartzite chips were found inside several rings. Among the rings was picked up one broken corner-notched point of basalt and one well-worked fragment of what I believe to be an awl. The most interesting site feature, however, was one elaborate ring whose inside diameters were twelve by fifteen feet. The stones composing this ring were lichen covered and appeared to be buried in the sod at the same depth as the stones from other circles. The distinctive element of this circle was its elaborate design (Figure 10).

26PA310.—This site is located on the second terrace above the Yellowstone River and about seventy-five yards from the river bank. The four distinct features of the site are:

1. One stone circle six feet in diameter
2. A diamond shaped pile of stones six feet long and one and one-half feet high
3. A small rectangle consisting of twelve stones, and about one and one-half feet in diameter
4. A line of stones 184 feet long that begins at one end with single stones placed together one after the other and
CONLIN TIPI RING SITE
24 PA 306

Figure 10.
gradually builds up to a stone wall about one and one-half feet high at the other end.

The site location by itself suggests nothing unusual although a small chip strewn area (24PA334) is located about seventy-five yards away near the river bank. What can be characterized as unusual about the site is its close proximity to a complex of sporadic rock rows and alignments scattered over a five square mile area on a plateau immediately east of the site between the Yellowstone River and Dailey Lake. The extent of this complex requires further exploration for new features and careful mapping before relationships may be hazarded.

24PA308.—Included within the confines of this site area are several major cultural features that include the large Emigrant Buffalo Jump, a campsite on the west bank of Fridley Creek extending for three-eighths of a mile along a gently sloping terrace down to the Yellowstone River, and twenty-three tipi rings on top of an isolated glacial moraine remnant on the east side of Fridley Creek. The rings found here range from ten to eighteen feet in diameter. Assuming these rings were domestic in function, why weren't rings also found as surface features in the campsite on the stream terrace below? Excavation in the campsite revealed three distinct occupation levels comprised of the usual campsite debris such as points, knives, scrapers, bones, charcoal, occasional potsherds, and no tipi rings, whereas, on the moraine remnant among the rings were found the usual scant artifacts associated with most stone circles in Southern Montana, a few chips and one projectile point (in this instance
a side-notched point). Two corner-notched points, reportedly found among these rings were also observed.

24PA313.—Situated on the north side of an unnamed intermittent stream with a centrally located water supply in the form of a large spring, this tipi ring site exhibited two distinct topographic features that marked the site as somewhat unusual. The western portion of the site comprises a good camping location with twelve well defined stone circles resting in the sod of a gently sloping terrace. Continuing eastward, the terrace rises gently to the top of a small hogback about 150 feet high and about 1,000 feet long. From this prominent location, the valley can be observed for miles in several directions. Atop the hogback, three looted burials were found, two at the east end and one at the west end. Spaced between the burials were seven stone circles. Basaltic rocks and boulders littering the ground both inside and outside the rings made several of them difficult to discern. Due to the rocky ground surface and the exceptionally strong winds that blow over the hogback, this seems a most unlikely campsite location for either temporary or extended occupation.

Among the rings on the terrace below the hogback, is found the somewhat rare occurrence of one ring overlapping another. This example was first observed by Dr. Carling Malouf on a visit to the site, and constitutes one of several occurrences of this feature found thus far in the Upper Yellowstone.

Although no artifacts were found within the rings, thirteen projectile points, including one lanceolate point, four stemmed base points,
six corner-notched points, and two poorly chipped side-notched specimens were recovered from the site. In addition, thumb scrapers, broken knives, and numerous chips, cores and blanks littered the site. No excavations were performed. However, examinations of a slumping cutbank, threateningly close to several rings, gave no evidence of stratigraphy.

24PA322.—A lone single course ring was found on a small level spot of a steep rugged hillside about one-half mile above the Yellowstone River. The site is near the canyon narrows about three miles south of Livingston, Montana. A search of the site vicinity failed to turn up any artifacts or any source of water nearer than the river below. A looted Indian burial, however, was discovered near the ring. The land owner stated that the stone covered skeleton was buried in an extended position. The ring and the burial are located near and on the same property that Mulloy (1958:180-182) reported rock mounds and a line of stone piles.

24SW202.—Located south of McLeod, Montana, at the juncture of the East Boulder and the Main Boulder River, 24SW202 presented a complex of stone circles, lines of rock piles, and other stone piles from which meandered lines of rocks. Other occupation sites are found nearby, but do not contain stone circles or other similar phenomena. The site is divided by a county road. West of the road are an undetermined number of stone circles difficult to locate since they are positioned among glacial boulders and outcrops on a rugged hillside. Several small springs emanate from the hillside among the boulders. East of the road are other interesting features among which is a stone circle twelve feet in diameter from which small stone piles spaced about twenty-five feet
apart head in a southerly direction across the site to disappear about 200 yards from the stone circle. On the other hand, the stone piles may have headed in a northerly direction toward the stone circle. Another feature was that of an oval shaped ring of river cobbles eight feet long and six feet wide with a sloping depression inside the ring. Nearby, atop each of three small hillocks was a stone pile about five feet in diameter with radiating rock lines that meandered to form an undetermined configuration that does not conform to the general conception of a medicine wheel.

24SW207.—One-half mile southeast of Big Timber, Montana, forty-six stone circles and one large stone structure comprise the Big Timber Tipi Ring Site. The site is located on the second terrace above the Main Boulder River on an ancient river bed of glacial origin. The rings are found along the terrace edge over an area one-half mile long and about 150 yards wide. The size of the circles range from eight to seventeen feet in diameter. A few rings contain stone piles in the center that may be hearths. Only one ring, about twelve feet in diameter, (with a line of stones bisecting the circle) diverged from the usual tipi ring pattern. Many circles were barely visible in the sod. The site is used for pasture because the cobbles and boulders that cover the site make cultivation impossible. Although the terrace is level, the rocky nature of the ground surface would have made this a poor camping location. No artifacts or chips were recovered from the site.

A large stone structure at the northern terminus of the site added interest because of its possible ceremonial use. Located at the
terrace edge, the structure may be described as nearly semicircular with radial extensions that leave an opening to enter the structure. (See Figure 11). The internal dimensions are forty by fifty-six feet with a twelve foot wide entrance. The large line of rocks forming the structure are six feet wide and may have been a wall fallen into disrepair. If so, the wall could not have been over four feet high. That it may have been a wall seems reasonable since the rocks appear to have fallen away from a central row or line where they remain piled about one and one-half to two feet high. No mortar was used with the stones and from its shape and possible association with the tipi rings it is believed to be of aboriginal origin.

Although the foregoing presentation of stone circle sites provides little, if any, evidence concerning their function, we have described features uncommon enough to warrant caution in generalizing about their functions. Stone circle sites in the Upper Yellowstone provide a number of variables unaccounted for in Kehoe's work in Northern Montana. Such features as stone circles in inhospitable locations, with excellent campsite locations nearby, a predominance of corner-notched rather than side-notched points, a lack of pottery, overlapping rings, and most often, a complete lack of any campsite or cultural debris, mark some of the problems that remain to be solved at stone circle sites in the Upper Yellowstone.

However, Kehoe's well documented historical and ethnographical evidence has provided a breakthrough that is, as yet, unachieved by archaeological research. This breakthrough is limited temporally and
Figure 11. Big Timber Tipi Ring Site (24SW207). Stone configuration.
geographically so that archaeology must take over to provide on a regional scale, with time depth, answers that should not be extrapolated from present evidence. Although at some future time anthropologists may conclude that most stone circles in the Northwestern Plains served a domestic function, it is clear that generalizations have flowed freely, and that speculation has often been proffered as evidence. It is also clear that thousands of tipi rings exist, that few have been recorded, that fewer still have been examined archaeologically (except to count the number of rings and measure their diameters), and that present published information (with the exception of Kehoe's work) is inadequate to provide conclusions regarding their function.

Pictographs and Petroglyphs

Pictographs and petroglyphs, scattered throughout many parts of Montana and often referred to as Indian "rock art," pose problems of age, meaning, and classification for anthropologists.

Pictographs may be defined as the figures and designs painted by Indians and other earlier peoples on the walls of caves, rock shelters, cliffs, etc., and more rarely, on animal skins, wood and bone. Petroglyphs are figures and designs literally carved into rock, wood, bone, etc., by incising, pecking, or abrasion. Both pictographs and petroglyphs contain similar design elements so that the basic distinction of whether a design was painted or carved is somewhat irrelevant when viewed from our present levels of understanding of such phenomena.

It is not now possible to closely date pictographs and petroglyphs. For example, Malouf (1961b:8) blanket dates them for Montana within the
past 2,000 years. Mulloy (1958:119-120), reporting on Pictograph Cave, placed the pictographs found there in the Late Prehistoric and Historic Periods, or Pictograph Cave III and IV (A.D. 500—1805). Earlier cultural deposits were so deep in the site that people of these earlier cultures would have been unable to reach the present levels of the cave where the pictographs are visible.

Relative ages, however, can be established in specific instances where one design was superimposed over another, or where human figures appear in boats or on horseback that date within the period of European contact. As well, the historic use of pictograph symbols on skins, shields, and drumheads that are nearly identical to designs of unknown time and origin also suggests recency. However, the question then arises as to the persistence in time of certain designs and their motifs or specific design elements.

The meaning of pictographs and petroglyphs must remain obscure since the symbolism they portray was highly individualized and known only to the person who made them or perhaps to other members of his culture. Nevertheless, "rock art" offers benefits to archaeology through illustration of objects in the material culture and the suggestion of cultural relationships through a comparison of stylized motifs and designs.

Although several classifications (Steward 1927; Cressman 1937; Malouf 1961) have been constructed to account for the variety of rock art designs found in the Western United States, these constructs have given little information other than to help establish a standard terminology
for discussion of designs and to specify certain design elements that may be significant in future studies.

Along the Upper Yellowstone within the thesis area, petroglyphs seem to be completely absent. This is true in Montana west of the Continental Divide although petroglyphs are common to certain areas east of the Divide on the Plains. In North Central Montana, they appear on horizontal stone surfaces. In Central and Southeastern Montana, they are more common to the vertical stone surfaces of rock shelters and cliffs.

Pictograph sites, on the other hand, appear from the Wyoming Basin to the river drainages of Central Montana where they tend to be concentrated. They are found throughout Montana west of the Continental Divide, and along the rivers and mountain flanks of Southwestern Montana, although they are almost nonexistent in the higher mountains. Both pictograph and petroglyph sites are frequent in the Central Yellowstone Valley around Billings, Montana. However, in the Upper Yellowstone, pictographs occur rarely, petroglyphs are absent, and both are apparently absent in Yellowstone Park.

Three pictograph sites were located in the Upper Yellowstone. Legible designs from these sites are common to Montana and Wyoming. Although pictographs within the state may appear in red, yellow, black, green, or white pigments, all the figures from thesis area sites were painted with red pigments.

**Durgan Cave Site, 24PA312.**—This site, located on the Tom Durgan Ranch ten miles south of Livingston, consisted of two burials in a small limestone cave. Above the cave entrance were smudges of red colored
pictographs so badly weathered that they were indecipherable. About seventy-five yards southwest of the cave on the same cliff another badly weathered and nearly illegible red pictograph was found. Although this pictograph had the generalized appearance of an inverted "rake" design, other associated traces of red suggested that formerly it consisted of a more complicated design.

_Carter's Bridge Pictograph Site, 24PA316._—The Carter's Bridge site is located two miles south of Livingston where the canyon narrows emerge into Paradise Valley to the south. The site is found 150 yards west of Carter's Bridge along the base of a large limestone cliff, and consists of red colored pictographs. Many of the figures are badly smudged and illegible, but five separate figures were legible enough to be recorded, and included: one complete shield figure, one partial shield figure, one elongated human-like figure, one dark red hand print, and one animal paw or track. Taken as a group, the legible designs are common pictograph figures found in many parts of Montana (Figure 12).

The shield figure, often referred to as a shield bearing warrior, is found throughout the Rockies from Alberta to Utah. According to Conner (1962a:8):

They appear as a human head and legs protruding from behind a circular object which covers the entire torso. Sometimes the body of the anthropomorph shows through the circular shield, but more frequently the shield is decorated with pictures of men, animals, faces, or geometric designs, or parallel lines.

The one complete example from 24PA316 lacked internal shield designs and measured twenty-one inches in height which is slightly larger than most shield figures in the state. The shield measured ten and
Figure 12. Carter's Ridge Pictograph Site (24PA316).

Figure 13. Main Boulder River Pictograph Site (24S.240).
one-half inches across. The adjoining figure is believed to be part of the shield of another similar figure. However, the parallel horizontal lines within the visible arc of the shield faded into indiscernibility, and what appears to have been an internal shield design is lost along with the rest of the figure.

The elongated figure to the lower right of the shield figure is unusual in design because most elongated figures found at pictograph sites in Montana that are associated with shield bearing warriors are V-shouldered with rectangular bodies. Many "V" shouldered figures have heads large enough so that facial features are often included. The elongated figure at 24PA316 has the same rounded smudge for a head as the shield figure. The most striking counterpart for the figures at 24PA316 is found 150 miles northwest in the Smith River Valley at 24ME304 (Bingham Picto Site) (Arthur 1960:43, Figure 3). Here, very similar figures are found in similar positions to each other on the cliff face. Both are outline figures painted with red pigments. The human hand symbol is present also at both sites.

The other design found at the Carter's Bridge Site consists of an animal track drawn in outline rather than in solid color.

Main Boulder River Ranger Station Pictograph Site: 24SW205

This pictograph site, located on Forest Service land south of Mcleod, Montana, is found in a large limestone cave three-quarters of a mile northwest of the ranger station. The 6,300 foot elevation of the cave high above the valley floor affords an excellent view south into the Main Boulder River canyon.
Easily accessible from the valley, the site was favored for occupation by the location of a spring about 200 feet from the cave.

The cave extends into the limestone about 125 feet where at the rear of the cave a ladder has been placed by forest rangers to gain access to a smaller cave above that opens on the cliff face to the east.

The pictographs, however, are found on the wall near the entrance of the lower cave. The mouth of the lower cave is about twenty feet high and twenty feet wide with the inside dimensions remaining about the same rearward for a distance of eighty feet where the cave then begins to narrow as it slopes upward toward the rear. Dirt fill of undetermined depth extends from the cave mouth to only twenty-five feet inside where it thins out to expose the limestone floor. Because the ceiling above the entrance portion of the cave was heavily smoke stained, a minor attempt was made to determine possible occupation levels near the entrance but this was discouraged by a rock hard layer of dung about eight inches thick.

On the west wall of the cave near the entrance is a panel of five well preserved pictographs painted with red pigment. Somewhat unusual for the area is the fact that this pictograph site is found well within the mountains. It is also unusual that these figures are solid colored rather than the outline figures generally found in Southcentral Montana (Figure 13).

The designs as illustrated consist of two human-like figures, a possible sun disk design, and two animal figures. Except for the small "pelt" figure, the other designs have no counterparts that I have observed among pictographs or petroglyphs in this region.
Since all of the designs are solid-colored and not in outline form, they fit Malouf's (1961:1) Type I, which he believes to be the earliest pictographs found in the state and to also have had the greatest geographic distribution in Montana and in some adjoining areas. Malouf's Type I pictographs are most common in Western Montana. Since their distribution generally follows the presumed range of late prehistoric Salish and Kutenai Indian bands who employed pictography in their vision quests, he notes the possibility that they may be ancestral to these groups (Malouf 1961:5-6).

Burials

For the prehistoric and early historic populations represented by the numerous and often large campsites, as well as by the many bison drive sites in the Upper Yellowstone, surprisingly few burials have been found. Seven probable burials, looted by relic hunters many years ago were examined during the course of the survey. Location information for a partially disturbed burial site found during the survey came from a local informant and member of the Montana Archaeological Society.

The Durgan Cave Site, 24PA312.—The Durgan Cave site, located ten miles south of Livingston, Montana, lies between Trail Creek and the Yellowstone River where the hill flanks merge into the terraces of the valley floor. The cliff at the cave location is composed of Madison limestone and runs in a northeast-southwest direction. The hill behind the cliff slopes into Trail Creek about 250 yards west of the cliff. Chert chips litter the hillside from the cliff to the creek within an area of several hundred
square yards and many outcrops of chert were observed. According to the owner, who had lived on the farm for over forty years, people from the area had picked the site for artifacts and had carted off truckloads of the loose chert to decorate fireplaces.

On the flat in front of the cave within a fifty foot radius of the entrance a few scattered chert chips were found, made from material indigenous to the site area. Leading up to the cave entrance was a steep slope about six feet high composed of rock fall and alluvium believed to have washed from the cave (Figure 14). Over the entrance were badly weathered pictographs.

The entranceway measured sixty-four inches in width and thirty-seven inches in height at the time of excavation. However, the owner reported that prior to disturbance, access could be gained only by crawling in on one's stomach. The entranceway extended inward eight feet, opening into a slightly larger area that split off into two courses. The left course extended about fifteen feet and opened into a small room six feet across and high enough for a man to stand upright. The right course had suffered a cave-in and the passageway was blocked (Figure 15).

The floor in the entranceway and a large part of the central area where the burials were located was badly disturbed. In this area loose soil covered the floor to a depth of eight inches. In the undisturbed portions where the two courses began, animal manure was solid to a depth of four inches on the floor surface. From the loose dirt which was removed and screened, three knives, a broken thumb scraper, one obsidian projectile point, and a polished stone pendant were recovered. Part of
Figure 14. Durgan Cave Site (24PA312). Facing north on cave.
Figure 15.
the bone assemblage of burial number one including the skull was visible along the edge of the disturbed area. However, the bones were mined throughout several soil levels from a depth of eleven to twenty-three inches.

Dr. Carling Malouf of the University of Montana Anthropology Department who excavated the site attributed the scattering of the bones to pack rat activity. Excavation of the burial exposed part of a stone lined hearth eight inches below the surface. Part of this hearth had been dug away. Protruding up through the one inch layer of charcoal and white ash were bones from the burial that had been charred from the fire. It appeared that the hearth stones had originally covered the burial but had been utilized at a later time to construct the hearth. The confinement of the bones to an area of less than three feet in diameter suggested that it was a secondary burial.

Burial number two was excavated by Dr. Malouf at the opening to the left course of the cave. Here at a depth of twenty inches he exposed a single layer of large cobbles that covered a secondary burial. The covering of stones was circular and measured thirty inches in diameter. Immediately below the stones, the bones were exposed. No attempt had been made to place the bones in a human-like context and they were merely piled together under the stones. With the exception of the mandible the skull was missing.

Elsewhere on the Yellowstone, Mulloy (1958:182) reported two historic burials near the town of Roberts, Montana. Both burials contained adult skeletons and although the details of association for one
burial was lost, the other appeared to have been extended, on his back, with his head to the east. Associated artifacts included:

... one side-notched concaved based projectile point, one badly rusted iron point, three dentalia, part of a bronze button, and an unidentified perforated object of bronze.

In the same reference Mulloy described other looted historic burials on Pryor Creek and Razor Creek. Those on Pryor Creek were six burials scattered along the edge of a low cliff and consisted of stone walled cysts "usually ovoid in shape, about five and one-half feet long by about three feet wide." They were originally believed to have been about three feet high. The walls of the cysts were of dry masonry and constructed of irregular sandstone blocks. Glass trade beads, harness straps and other articles of historic origin were found about them.

The Razor Creek burials near the city of Billings, Montana consisted of seven stone cysts on a cliff edge similar to the Pryor Creek site (Mulloy 1958:185). They were described as:

... partly of irregular sandstone slabs and boulders and partly adapted to the natural contour or rock crevasses. They average a little over 5 1/2 feet long and 2 1/2 feet wide. The usual shape is ovoid. All had been rifled and contained nothing.

The remains of a large fire was found in the vicinity of the graves. Artifacts recovered included pottery fragments, "a number of jasper and obsidian flakes, one side notched, concave based projectile point, three plano-convex scrapers, and a chopper."
### Sites and Legal Locations

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CHAPTER IV

ARTIFACTS

Using the criteria that artifact classes are based on a single attribute shared by a number of artifacts, materials found were grouped together into categories of chipped stone, ground stone, pottery, and so on. These classes were then delimited into artifact types on the basis of at least one additional shared attribute. For example, projectile points, classified under chipped stone artifacts, shared additional attributes of form, flaking technique, size, and kind of material used in manufacture.

Chipped Stone Artifacts

Since the classification of certain specimens that might be projectile points, or knives, or blades, remains arbitrary, specific marginal specimens, difficult to classify, were arbitrarily placed within one of these groups although they may have served their artisans in one of the other groups.

No distinctions have been made between atlatl points and arrow points. Since such decisions usually involve size, as well as form and flaking technique, many specimens could have served equally well as either atlatl or arrow points.

Projectile Points

From the Upper Yellowstone, projectile points of eight forms that characteristically belong in Mulloy's Early Prehistoric Period are few
in number and thus far have been found as scattered surface finds. Within Yellowstone Park, Hoffman (1961) reported one Hell Gap point (dated at Type site 8390 B.C. or 10,850 ± 550 B.P. Agogino 1961:558), and a Cody Knife from the later Cody Complex as the only definite Early Period artifacts found there. Lanceolate points that may belong to the Early Prehistoric Period were also reported by Hoffman. Taylor (1964:105) in an unpublished manuscript reported "slender stemless lanceolate points" that "fall within the size range and description given for Agate Basin points (Wormington 1957:263)." Taylor further stated that these same points were "nearly identical with the widely distributed Cascade points illustrated by Butler (1961:Figures 2 and 3)."

Other Early Prehistoric Period finds north of the Park include the base of a Clovis point, two Scottsbluff points, and two Agate Basin points that follow in this report as Types I, II, and III.

Type I. "Clovis" points. (Figure 16,a)

These points are described by Wormington (1957:263) as:

Fluted lanceolate points with parallel or slightly convex sides and concave bases. They range in length from 1 1/2 to 5 inches but are usually some 3 inches or more in length and fairly heavy. The flutes sometimes extend almost the full length of the point but usually they extend no more than half way from the base to the tip. Normally, one face will have a longer flute than the other. The fluting was generally produced by the removal of multiple flakes. In most instances the edges of the basal portion show evidence of smoothing by grinding.

The Upper Yellowstone specimen may be described as:

Exhibiting parallel flaking with fine retouching along the edges and some retouching along the base. Fluting is accomplished on each face by removal of a single large flake. The flute on one face is 2.0 cm. in length, and on the opposite face extends beyond the point of
break which is near mid-section of the point. The specimen is oval in cross-section. The edges and base are ground.

Sample: One base

Material: Obsidian

Size: Length: Undetermined; Width: (at widest measurable point) 2.22 cm.; Thickness: 0.5 cm.

Provenience: This specimen was recorded for the survey as a random surface find since its location was the exposed surface of a layer of clay at the site of the new post office in the town of Gardiner, Montana (El. ca. 5,200 feet). The specimen was recovered by Mr. Otho Mack of Gardiner after power digging equipment excavated the location preparatory to construction of the building. The specimen is in Mr. Mack's possession, and according to him was identified by Dr. H. M. Wormington of the Denver Museum as a Clovis point.

Although the specimen found at Gardiner, Montana, may represent the earliest evidence of man in the Upper Yellowstone, other Clovis points have been recovered within the state.

The base of a point, tentatively identified as Clovis, was found on North Line Creek in Carbon County southwest of Billings, Montana. Recovery was made by a member of the Billings Archaeological Society who pulled a bison neck vertebra from a fresh cutbank along the creek. The point fell out with the vertebra. Other vertebrae were later removed but were not articulated. Whether the vertebrae were from one of the extinct bison forms has not yet been determined. Under the circumstances of discovery, the artifact bone association was unconfirmed.

Clovis points have been found throughout the high Plains along the east slope of the Rockies from Texas into Alberta, Canada. They are also reported from the western slopes of the Rockies, and recently, by Butler (1963:22-23) in the Camas Creek Basin of South-Central Idaho. In Arizona, New Mexico, and Colorado, Clovis artifacts have been excavated in direct association with the remains of mammoth. The Clovis hunters are temporally bracketed as occupying the high plains between 10,000 and 13,000 years ago (Wormington 1957). In Montana, the partial remains of mammoth have been recovered in the Yellowstone Valley and elsewhere, but, thus far, no direct association between man and mammoth has been established in this region.

Comparable Specimens:

Butler, 1963, pp. 22-23 . . . . . . . . . . . . . . . . . . . . . . . . Southern Idaho
Forbis, 1952, p. 128. . . . . . . . . . . . . . . . . . . . . . . . MacHaffie Site, Montana
Forbis and Wormington, 1965 . . . . . . . . . . . . . . . . . Alberta, Canada
Taylor, 1960, p. 13 . . . . . . . . . . . . . . . . . . . . . . . Great Falls, Montana
Wormington, 1957. . . . . . . . . . . . . . . . . . . . . . . . High Plains of the Rocky Mountains
Type II. "Scottsbluff" points. (Figure 16,b).

Scottsbluff points have been described by Wormington (1957:267) as consisting of two types.

Type I — Points with somewhat triangular or paralleled sides blades, small shoulders and broad stems. The flaking is usually of the transverse parallel type, but it may be more irregular. The cross-section is thick oval. The stem edges are usually ground. The range in length is from 2 to 5 inches. Most specimens are between 3 and 4 inches long and about 1 inch wide. Many of those that are less than 3 inches long compare with the longer specimens in breadth and may represent points that were reworked after tips had been broken.

Type II — Points that resemble Type I but that have wider triangular blades, are thin and lenticular in cross-section, and have more clearly defined shoulders.

The Upper Yellowstone Specimen Exhibits:

Transverse parallel flaking with sporadic retouching along edges and along the stem and base. The base is slightly convex. The specimen is oval in longitudinal cross-section. The base and edges of the stem evidence light grinding.

Sample: One complete specimen of Wormington's Type I.

Size: Blade Length: 6.15 cm.; Overall Length: 8.45 cm.; Stem Length: 2.3 cm.; Stem Width: 2.45 cm.; Thickness: 0.7 cm.

Material: Tan colored quartzite.

Provenience: 24PA329

This specimen was picked up by Mrs. E. H. Merrell in the garden plot at the Merrell Ranch. The ranch is located near the mouth of Tom Miner Basin at the southern end of the Paradise Valley. Other artifacts generally assigned to the Middle Prehistoric Period were also found by Mrs. Merrell in the garden plot. The elevation of the site is 5,700 feet or 700 feet above the present Yellowstone Valley floor in that vicinity.

Scottsbluff points, Eden points, Cody Knives and certain non-diagnostic artifacts are now generally accepted together under the designation "Cody Complex" (Wormington 1957:128). Since publication of Dr. Wormington's book in 1957, another point type, "Allen Points," (Mulloy 1959:112-115) have been added to the Cody Complex.
Although the geographic center for the Cody Complex appears to be Montana, Wyoming, Colorado, and Nebraska, Scottsbluff points have been found in Texas, and Louisiana, and northward in Alberta and Saskatchewan (Wormington 1957:123). Mason and Irwin (1960:43-57) extended the range of the Cody Complex considerably northeastward with their report of an Eden-Scottsbluff burial in northeastern Wisconsin. Also, Swanson (1961:26-30) extended it westward with the report of an Eden point and an Alberta point from southern Idaho.

In Montana, the best documentation of the Cody Complex has come from the MacHaffie Site near Helena, Montana (Forbis and Sperry 1952). Here, Scottsbluff points were massed in a soil zone about 4 inches thick, separated from an underlying Folsom component by fine grained gray clay (Forbis and Sperry 1952:127).

From Pictograph Cave near Billings, Montana, Pictograph Cave I, the lowest level, yielded two Eden points (Mulloy 1958:208).

Occasional surface finds have also enlarged the areal distribution of Cody artifacts in Montana. Shumate (1958-59:3-4) reported a Scottsbluff point and what appears to be the mid-section of an Eden point that are likely Scottsbluff points.

Comparable Specimens:

Dick & Mountain, 1960 ................ Northeastern, Colorado
Forbis & Sperry, 1952 ................ MacHaffie Site, Montana
Forbis & Wormington, 1965 .......... Alberta, Canada
Mason & Irwin, 1960 ................. Northeastern, Wisconsin
Mulloy, 1958 ...................... Pictograph Cave I, Mont.
Mulloy & Lewis, 1943 .............. Eastern Montana
Shumate, 1959 ..................... Great Falls, Montana
Swanson, 1961 ..................... Southern Idaho
Wormington, 1958 .................. High Plains of the Rocky Mountains

Type III. "Agate Basin" points (Figure 16, c and d).

Agate Basin points are described by Wormington (1957:269) as:

Long slender points with sides slightly convex or almost parallel. The maximum breadth of specimens with curved sides is usually above the mid-point. Bases are straight or convex. In some instances the bases are almost as pointed as the tips. Flaking is usually of the horizontal parallel variety, and there is a fine marginal retouch and pronounced grinding of the lower lateral edges; the base is rarely ground. There is considerable variation in size with a range of between 2 1/2 and 6 inches.
The Upper Yellowstone specimens are described thusly:

**Specimen One**: Transverse, oblique, pressure flaking with fine retouching along the edges of the blade. No grinding of the edges or the base. Oval in cross-section (Figure 16, c).

**Specimen Two**: Transverse, oblique pressure flaking with fine retouching along the blade edges. No grinding of the edges or the broken base. Sides are parallel. The specimen becomes thick oval to round toward the tip (Figure 16, d).

**Sample**: Two specimens

**Material**: Specimen one, striated agate; specimen two, smokey agate.

**Size**: Specimen One, Length: 6.67 cm.; Width: 2.35 cm.; Thickness: 0.6 cm.
Specimen Two, Length: 7.0 cm.; Width: 2.05 cm.; Thickness: 0.78 cm.

**Provenience**: Neither specimen was found during the survey. Both were isolated surface finds of Mr. George Mack and his son Otho Mack of Gardiner, Montana. According to Mr. Otho Mack, specimen one was found by his father on the topmost point of Sunset Peak (elevation 10,243 feet) on Ash Mountain located nine miles northeast of Gardiner, Montana. Specimen two was picked up by Mr. Otho Mack on Little Trail Creek about two miles northwest of Gardiner. Both of these specimens were identified by Dr. Wormington as Agate Basin Points.

Recent information on Agate Basin points and their significance has been published by Agogino and Galloway (1965:190-193). At the Brewster Site, located within a mile of the Agate Basin type station, three cultural components were identified. The two upper components produced Agate Basin material and the lower one, Folsom artifacts. Radiocarbon dated charcoal placed the Agate Basin levels at 7490 B.C. (9350 ± 450 years B.P.), and the Folsom level at 8029 B.C. (10,375 ± 700 years B.P.) Bison skulls from all three levels were identified as those of Bison antiquus.

Further work by Agogino in the Agate Basin area produced another Hell Gap site (The Sister's Hill Site) from which charcoal yielded a radiocarbon date of 7690 B.C. (9650 ± 250 years B.P.) (Agogino and Galloway 1965:192). Radiocarbon dates from the Brewster Site and the Sister's Hill Site, combined with associated artifacts that Agogino maintains "could easily fit into any northern High Plains complex from Folsom to Cody," have led him to tentatively conclude that "Hell Gap, as a complex, is either a late Agate Basin development or is a developmental stage of the Alberta Complex, which itself is ancestral to the Cody Complex." (Agogino and Galloway 1965:191).
Comparable Specimens:

Agogino & Galloway, 1965 ............. Agate Basin, Eastern Wyoming
Husted, 1965, a....................... Big Horn Canyon, Montana
Roberts, 1943 ........................ Agate Basin, Eastern Wyoming
Roberts, 1952 ......................... Agate Basin, Eastern Wyoming
Swanson, 1961 ......................... Snake River Plain, Idaho
Wormington, 1957 ...................... Moose Jaw, Saskatchewan & Cumro, Nebraska
Wormington & Forbis, 1965 .......... Alberta, Canada

Type IV. Slender, stemless lanceolate points (Figure 16, e-g).

Specimen One: Was made from obsidian and shows horizontal parallel flaking with retouching along the edges. The lateral edges of the base are lightly ground, but the rounded base has been broken and it is impossible to tell if it had been ground.

Specimen Two: Was made from siltstone. It exhibits irregular flaking with an occasional retouch and shows no grinding of the edges or the convex base.

Specimen Three: Appears to be made from hematitic siltstone. The flaking varies from diagonal to irregular. The convex base has been lightly ground. The lateral edges from mid-point to the base were smoothed by light grinding.

Sample: Three specimens.

Material: Specimen 1, obsidian; Specimen 2, light gray siltstone; Specimen 3, hematitic siltstone.

Size: Specimen 1, Length 5.4 cm.; Width 1.4 cm.; Thickness .6 cm.
Specimen 2, Length 4.7 cm.; Width 1.2 cm.; Thickness .45 cm.
Specimen 3, Length 4.1 cm.; Width 1.65 cm.; Thickness .65 cm.

Provenience: 24PA302

Comparable Specimens:

Specimen 1:
Gruhn, 1964, Fig. 1, 0 ............... Southwest Idaho

Taylor, D.C., 1964, Preliminary Archaeological investigations in Yellowstone Park, p. 107, Type III.
Figure 16. Projectile Points. 
a. Type I, Clovis point;  
b. Type II, Scottsbluff point;  
c-d. Type III, Agate Basin points;  
e-g. Type IV, Lanceolate points.
Type V. Long, slender, stemless, lanceolate points with incurring bases. (Figure 17, a and b).

Specimen One: Shows oblique parallel flaking with careful retouching. Basal thinning was accomplished by removal of a short broad flute on one face and by removal of two narrow flakes on the opposite face. The tangs have been broken off, but the base and lateral edges were smoothed by light grinding. This specimen is thin oval in cross-section.

Specimen Two: Represented by the base, shows careful oblique flaking with a careful retouch. The edges and base were very lightly ground. Basal thinning was done by removal of several long flakes from each face. Thin oval in cross-section.

Sample: Two incomplete specimens.

Material: Quartzite.

Size: Specimen One, Width: 2.3 cm.; Thickness: 0.6 cm.
Specimen Two, Width of base: 1.6 cm.

Provenience: 24PA301

Type VI. Short, thick, lanceolate points with irregular straight or slightly convex bases (Figure 17, c-h).

Flaking on these specimens is diagonal and varies from even to irregular. The bases and the lateral edges of the base are heavily ground. Specimens are thick oval in cross-section.

Sample: Six specimens.

Material: Obsidian, mottled green chert.

Size: The one complete specimen had dimensions of:
Length: 5.4 cm.; Width: 2.2 cm.; Thickness: 0.8 cm.

Provenience: 24PA302

Comparable Specimens:
Gant, 1961. South Dakota
Osborne & Crabtree, 1961, Upper McNary Reservoir, Fig. 9, p. 285. Columbia River
Swanson, Tuohy, and Bryan 1959, Type 24, pp. 11 and 24. Idaho

It is noted that these specimens bear a strong resemblance to Angostura points. If later, they should be classified as Angostura,
Figure 17. Projectile points. a-b, Type V; c-h, Type VI.
this would place the beginning occupation of the Carbella Site late in the Early Prehistoric Period.

**Type VII. "McKean Points"** (Figure 18, a).

McKean points are described by Mulloy (1954:444-445) as appearing to vary around a single norm.

The simplest form is a lanceolate blade, usually with blade edges incurved toward tip and tapering toward base about midway between tip and base. Occasionally sides of the proximal blade-half are parallel. Usually base is sharply concave, though sometimes concavity is slight or absent.

From strictly lanceolate points the type shades into blades with slight constriction of base sides to form a scarcely perceptible stem defined by a slight shoulder. Sometimes this constriction takes the form of a slight lateral notch, which is to say that the proximal end of the base appears slightly expanded.

All variants have cross-sections usually lenticular, though frequently plano-convex with one side revealing the original flake surface. Blade edges are usually sharp and thin, varying from even and symmetrical to sinuously irregular, with frequent hinge fractures and flakes not commonly extending beyond the blade midpoint. Sharp edges were produced principally by primary flaking and only infrequently has short, secondary, retouch been resorted to along edges. Basalar concavities are produced by short, longitudinal, flakes with sometimes considerably thin proximal ends. Bases and stems or proximal blade edges on lanceolate points are sharp. There is no grinding or other intentional dulling.

**Sample:** Two specimens

**Material:** Obsidian, agate

**Size:**
- Obsidian—Length: 4.3 cm.; Width: 1.9 cm.; Thickness: 0.4 cm.
- Agate—Length: 4.3 cm.; Width: 1.6 cm.; Thickness: 0.3 cm.

**Provenience:**
- 24PA301 Obsidian
- 24PA302 Agate

**Comparable Specimens:**

Coe, 1959, p. 432, Fig. 1, . . . . . . . . The Edgar Site, Northwestern Wyoming
Type VIII. Bifacially flaked lanceolate points (Figure 18, b-f).

Specimen One: Exhibits irregular percussion flaking of crude execution. The specimen appears also to have been broken at the tip and reworked. The lateral edges and the base evidence light grinding. The base appears very similar in shape to that of certain McKean points.

Specimen Two: May be a crudely flaked McKean variant. However, the lateral edges from the base to one-half the specimen's length have been lightly ground.

Specimen Three: Shows irregular flaking with retouching along the edges. Beginning about midway between the tip and base is a slight constriction forming a convex stem gently rounding off to a narrow flat base. The stem and base are not ground.

Specimen Four: Has nearly straight expanding edges that begin to curve to the base about three-fourths the distance from the tip to the base. Toward the tip, flaking is even. In longitudinal cross-section, the specimen gradually thickens toward the indented base that is thinned by removal of short longitudinal flakes.

Sample: Four specimens

Material: Quartzite

Size: Specimen 1, Length: 5.1 cm.; Width: 2.5 cm.; Thickness: 1.3 cm.
Specimen 2, Length: 5.2 cm.; Width: 2.0 cm.; Thickness: 0.9 cm.
Specimen 3, Length: 4.7 cm.; Width: 2.0 cm.; Thickness: 0.75 cm.
Specimen 4, Length: 4.6 cm.; Width: 1.0 cm.; Thickness: 0.75 cm.

Provenience: 24PA302
These specimens are included together as a type for purposes of recording and because they have no counterparts of which I am at present aware.

**Type IX. "Duncan Points" (Figure 18, g-j).**

The Duncan Point is described by Wheeler (1957:7) as:

A stone projectile point characterized by a straight converging or bilaterally convex blade; insloping, non-barbed shoulders; and a straight parallel-sided or slightly expanding stem with shallowly notched base.

**Sample:** Six specimens

**Material:** Quartzite, jasper, obsidian, basalt

**Size:** No complete specimens

**Provenience:**
- 24PA302 (5) Four quartzite, One jasper
- 24PA313 (1) One basalt

**Comparable Specimens:**
- Arthur 1963, p. 21, p & r . . . . . . . . . Western Montana
- Bliss 1950, Levels II & III . . . . . . . . . Birdshead Cave, Wyoming
- Coe 1959, Fig. 1, g . . . . . . . . . Edgar Site, Wyoming
- Jennings 1957, Fig. 82a & 82b . . . . . Danger Cave, Utah
- Malouf 1956, Pl. II, Level IV . . . . . . Western Montana
- Mulloy 1943, Fig. 20, A, 9-10 . . . . . Red Lodge Site, Montana
- Mulloy 1954a, Fig. 4, 31-40 . . . Lower Level, McKean Site
- Mulloy 1958, Fig. 6, 5-12 . . . . . . . . Pictograph Cave I, Mont.
- Mulloy & Lewis 1943, Fig. 23, 20-26 . Near Glendive, Montana
- Shumate 1958-59, P. 4, Fig. 3 . . . . . . . Great Falls, Montana
- Shumate 1962, p. 7, Nos. 3-4 . . . . . . Great Falls, Montana
- Swanson & Powers 1964, Fig. 1, i, q, &r . . . . Southwestern Idaho
- Strong 1935, Pl. 25, Fig. 1, d . . . . . . . Signal Butte, Nebraska
- Swanson, Tuohy, & Bryan 1959, P. 74,
- 25-26 . . . . . . . . . . . . . . . Central & South Idaho
- Taylor 1964, Type VIII, Fig. 14 . . . . Yellowstone Park, Wyoming
- Wettlaufer 1955, Pl. 13, No. 1 . . . . Mortlach Site, Sask.
- Wheeler 1954, Fig. 1, a-e . . . . . . . . Wyoming & South Dakota

**Type X. "Hanna Points" (Figure 19, a-f).**

This point type is described by Wheeler (1954:8) as:

. . . a chipped stone projectile point characterized by a straight converging and incurring blade; straight or insloping
Figure 18. Projectile points. a, Type VII, McKean point; b-f, Type VIII; g-j, Type IX, Duncan points.
and slightly barbed shoulders; and an expanding stem with shallowly notched or straight thinned base.

Sample: Fourteen Specimens

Material: Quartzite, jasper, obsidian, siltstone, chalcedony

Size: Smallest, Length: 2.2 cm.; Width: 1.65 cm.; Thickness: .45 cm.
Largest, Length: 5.5 cm.; Width: 1.8 cm.; Thickness: .50 cm.

Provenience: 24PA302 - quartzite (5); jasper (2); obsidian (1)
24PA313 - quartzite (1); siltstone (1); chalcedony (1)
24GA306 - obsidian (1)

Comparable Specimens:

Coe 1959, Fig. 1, k .................... Edgar Site, Wyoming

Haines 1962, Rigler Bluffs Site, Upper Yellowstone (C-14 date 3,078 ± 250 B.C.)

Mulloy 1943, Fig. 20, A, 7, 8 & 12 ...... Red Lodge Site, Montana
Mulloy 1953, Fig. 25, No. 6 .............. Ash Coulee, Lower Yellowstone

Mulloy 1954b, Fig. 21, No. 5 - 6 .......... Shoshone Basin, Wyoming
Mulloy 1958, Fig. 6, Nos. 27-33 .......... Pictograph Cave II, Mont.
Mulloy & Lewis 1943, Fig. 28, Nos. 20-22. Vicinity of Glendive, Montana

Ruckdashel 1953, p. 10, Fig. 1 ............. Flathead Lake, Montana
Strong 1935, Pl. 25, Fig. 1, a, b, c, d .. Signal Butte I, Nebraska (C-14 date 1500 B.C.)

Swanson, Tuohy, & Bryan 1959, p. 74, No. 26, Central and South Idaho
Taylor 1964, Type IX, Fig. 15, A - C .... Yellowstone Park, Wyoming
Wheeler 1954, Fig. 2, a - d .............. Western Nebraska & Wyo.

Type XI. Stemmed, indented base points (Figure 19, g-i).

These specimens have triangular shaped blades with short incurvate stems and a basal notch. The notch and incurving stem are heavily ground. Flaking on the smaller specimen is well controlled, but on the larger specimen is less even and more irregular.

Sample: Three Specimens

Material: Obsidian

Size: Largest specimen, Length: 4.4 cm.; Width: 2.4 cm.; Thickness: 0.7 cm.
Smallest specimen, Length: (projected) 3.8 cm.; Width: 2.65 cm.; Thickness: 0.7 cm.
Provenience: 24PA302

Comparable Specimens:

Swanson, Tuohy, & Bryan 1959, p. 77,
48 & 56.............................. Central & South Idaho
Tuohy & Swanson 1960, p. 21, Fig. 1,
4, & 2.............................. Southwest Idaho

Archaeological explorations in Central and South Idaho in 1958 (Swanson, Tuohy, and Bryan 1959) yielded among the specimens two types; numbers forty-eight and fifty-six, that are believed to be present in the Upper Yellowstone, (Swanson, Bryan and Tuohy 1959:17 and 19, and 77, Numbers 48 and 56). Other specimens of these two types were found in a rockshelter in southwest Idaho (Tuohy and Swanson 1960:20-24). From the descriptions given, the primary difference between the Idaho finds and those from 24PA302 lies in the quality of the flaking.

Tuohy (1960:21) comments that Idaho Type 56:

... is similar to a group of points found throughout Western North America known as 'Stemmed, Indented Base Points.' It does not have exactly the same characteristics, however, and it is more or less intermediate between two types, W-10 and W-31, found in Danger Cave, Utah, (Jennings, 1957, pp. 110 and 125). We would suggest that it may be a late variant of the Pinto Basin group (cf. Wormington, 1957, pp. 165-169).

Type XII. Short stemmed, indented base points (Figure 19, j-m).

Specimens have a blade with straight or slightly excursive edges. The barbed blade and narrow stem result from removal of a wide and relatively deep corner notch. Corner notches are formed by removal of one or more flakes. The indented base results from thinning through removal of one or more flakes to form a notch, or slightly indented, base. These points are thin and oval in cross-section.

Sample: Seven specimens

Material: Obsidian, chert, and basalt

Size: One complete specimen, Length: 3.8 cm.; Width: 1.8 cm.; Thickness: 0.5 cm.; Average width of three other measurable specimens: 2.55 cm.; Average thickness: 0.6 cm.

Provenience: 24PA302

Comparable Specimens:

Forbis 1950, p. 5, Figs. 65, 67.......... Near Helena, Montana
Griswold & Larom 1954, p. 33, n........ (Hellgate) Survey, Western Montana
Figure 19. Projectile points. a-f, Type X, Hanna points; g-i, Type XI; j-m, Type XII.
These specimens closely resemble a few of the specimens found during the 1959 Southwestern Idaho survey (Swanson, Powers and Bryan 1964: p. 13, Figure 3, b, p, r, s, and v). It is noted that the specimens from Idaho constituted several types. However, in spite of the difficulties in making comparisons from photographs, I think that the specimens from 24PA302 fall within the range of specimens illustrated in Figure 3.

Type XIII. Triangular, corner-notch points with straight or slightly outcurving blades and straight or slightly convex bases (Figure 20, a-e).

These points are characterized as generally being made from thin chips. They range from a very casual shaping by flaking along the edge only, to very fine oblique pressure flaking with retouching. Bases are generally thinned but rarely ground.

Sample: Twenty-one specimens

Material: Yellow jasper, obsidian, fossil wood, and chert

Size: Smallest complete specimen, Length: 3.2 cm.; Width: 1.7 cm.; Thickness: 0.3 cm.
Largest nearly complete specimen, Length: 4.5 cm.; Width: 2.1 cm.; Thickness: 0.55 cm.

Provenience: 24PA302 24PA313
24PA306 24PA319
24PA309 24PA321
24PA312 24PA324

This type represents a catch-all for a number of specimens that with a larger sample could have easily been broken down into a number of types.

They represent moreover, corner-notch points widely spread over the Northwestern Plains, the Northern Rockies, the Snake River Plain, and the Great Basin.

Type XIV. Triangular corner-notch points with straight or excursive blades and with indented or notched bases (Figure 20, f-g).

The points included in this type are very similar to those in Type XIV, but have indented bases formed most often by removal of a single flake from each face to form a notch, and less often by the removal of several longitudinal flakes. The corner notches are often ground but the basal notch is rarely ground.

Sample: Seven specimens
Material: Obsidian, jasper

Size: No complete specimens

Provenience: 24PA302

Type XV. Incipient side-notched triangular points with straight or slightly convex blades (Figure 20, h–k).

These points are characterized by a base slightly narrower in width than the widest part of the blade. Generally, flaking is well executed. Bases may be convex, irregular straight, or indented. All specimens with one exception exhibited basal thinning by removal of several or more longitudinal flakes.

Sample: Eight specimens

Material: Yellow jasper, obsidian, chert, flint, quartzite

Size: Largest specimen, Length: 5.15 cm.; Width: 2.55 cm.; Thickness: 0.8 cm. --- Smallest complete specimen, Length: 2.7 cm.; Width: 2.0 cm.; Thickness: 0.5 cm.

Provenience: 24PA302
24PA313
24PA321

Type XVI. Triangular shaped points with excursive blades, shallow side notches and irregular straight or indented bases (Figure 20, l–o).

These specimens show well executed flaking. The bases are thinned by removal of several longitudinal flakes from both faces of the base.

Sample: Five specimens

Material: Yellow and red jasper

Size: Largest specimen, Length: 5.5 cm.; Width: 1.9 cm.; Thickness: 0.5 cm. --- Smallest specimen, Length: 3.4 cm.; Width: 1.9 cm.; Thickness: 0.5 cm.

Provenience: 24PA309
24PA313

These particular projectile points have a very close resemblance to Besant points. Four of the five specimens were excavated from the small Emigrant Bison Kill (24PA309). Using Mulloy's (1958) estimates, I reported (Arthur 1962:26) a beginning date for these specimens possibly as early as the time of Christ. Wettlaufer's reports on the Mortlach
Figure 20. Projectile points. a-e, Type XIII; f-g, Type XIV; h-k, Type XV; l-o, Type XVI.

At the time of my report in 1962, I was not considering the possibility that elements of the Besant Culture might be present in the Upper Yellowstone Valley. However, the very close similarity between the Upper Yellowstone finds and Besant points from Southern Saskatchewan, combined with the closeness between the radiocarbon date and my estimate, leads me to conclude that Type XVI points are very likely Besant points. That Besant points are being found in bison kills in Southern Saskatchewan is also important to note since four of the five specimens reported here are from a bison kill site (24PA309).

Other projectile points believed to be of Type XVI, but lacking descriptive data, were reported by Malouf (1962:14) from the Madison Buffalo Jump located near the town of Three Forks, Montana.

**Type XVII.** Slender, triangular, side-notched points, thick-oval in cross-section (Figure 21, a-b).

Relative to their width, these specimens are thick in cross-section. Flaking is well executed with retouching along the blade edges. Bases are either concave or convex. Bases are thinned by removal of longitudinal flakes, and there is no evidence of basal grinding.

**Sample:** Two specimens

**Material:** Obsidian, Yellow Jasper

**Size:** Both specimens have the tips missing and the obsidian specimen must be considered a fragment. The other specimen however has a width of 1.55 cm. and a thickness of 0.55 cm.

**Provenience:** 24PA302

Types XVII, XVIII, and XIX, reported here, are similar to later side-notched points of the Late Prehistoric Period. However, these three types are generally larger in size and thicker in cross-section than side-notched points from bison drive sites and other thesis area sites attributed to the Late Prehistoric Period. The three above mentioned point types were excavated along with other projectile points generally attributed to Mulloy's Middle Prehistoric Period from a single component site in which it appeared that a considerable mixing of materials had occurred due to natural soil disturbances.

Since the site (24PA302) is located on the bank of the Yellowstone River, soil disturbance is believed to have been caused by periodic spring flooding of the primary terrace during those centuries that the site was occupied.
Another event that probably affected the site was a large earth slide that occurred in the narrows of Yankee Jim Canyon about one mile upstream from the site. The slide dammed up the river to form a narrow lake that extended fourteen and a half miles upriver to the vicinity of Gardiner, Montana. Radiocarbon dates derived from charcoal found in a hearth buried deep in the lake silts at the Rigler Bluffs Site (24PA401), with an average age of 5,050 ± 150 years B.P. (Haines 1962:3), establish formation of the lake as prior to 5,000 years ago.

According to John Good, Yellowstone National Park geologist who studied the area:

The dam was short lived as the lake did not modify significantly pre-existing valley topography nor are its deposits anywhere thick or extensive. Dam failure produced a torrential flood which swept slide debris into great bar-like forms immediately below the slide mass west of the river and left lag deposits of huge boulders east of the river. (Good 1964:Abstract).

The time of "dam failure" is not known nor is its affect on site 24PA302 known. However, projectile point types from 24PA302 indicate occupation throughout the Middle Prehistoric Period and the dam probably went out sometime after occupation of the site began.

**Type XVIII.** Triangular points with a short, broad, blade, wide shallow side-notches, and wide, irregular straight bases (Figure 21, c-f).

The bases of these points are wider than the blade. The bases, thinned by removal of longitudinal flakes, were then retouched and smoothed by light grinding.

**Sample:** Four specimens

**Material:** Obsidian, chalcedony

**Size:** Tips are missing from the two larger specimens. The average length of the two smaller specimens is 1.87 cm. Average blade width of all specimens is 1.48 cm. The average base width of the three measurable specimens is 1.73 cm., and the average thickness of all specimens is 0.45 cm.

**Provenience:** 24PA302

These points closely resemble the Bitterroot side-notched points as reported by Swanson, Butler, and Bonnichsen (1964:Figure 36, c and d) from Idaho. The Upper Yellowstone specimens, however, are smaller in size than the Idaho specimens and may also be different in ways not included in descriptions of Bitterroot points.
Type XIX. Triangular side-notched points with out-curving blades and convex or concave bases (Figure 21, g-i).

Notches are acute on these specimens and the base height is greater than the notch width. Specimens are pressure flaked with retouching along the blade edges. The bases are thinned and are not ground. These points are thin-lenticular in cross-section.

**Sample:** Three specimens

**Material:** Obsidian, chert

**Size:** Average length: 3.3 cm.; Width: 1.9 cm.; Thickness: 0.35 cm.

**Provenience:** 24PA302

These three specimens closely resemble specimens from the Simonsen Site and Hill Site in Iowa (Frankforter and Agogino 1960:65-70). Since the Carbella Site materials are not dated, there is a good possibility that the large side-notched points from this site may be related to the Logan Creek Complex which may have a much wider geographic representation than previously has been considered.

Type XX. Small, triangular, side-notch points, with straight or convex bases (Figure 21, j-m).

Using criteria set up by Forbis (1960:99-100), these specimens conform to his Nanton type. Base width is equal to or greater than body width. Height of the basal edge is equal to or less than notch width. Length-width proportions are roughly 1:1 to 2.5:1. Specimens are pressure flaked and bases are thinned.

**Sample:** Sixty-one specimens.

**Size:** Largest, Length: 2.7 cm.; Width: 1.6 cm.; Thickness: 0.4 cm. --- Smallest, Length: 1.5 cm.; Width: 1.0 cm.; Thickness: 0.15 cm.

**Material:** Yellow jasper, obsidian, agate, chert, basalt, quartzite

**Provenience:** 24CA305
24PA308
24PA309
24PA321

Forbis (1960:100) estimates the time range of Nanton points at A.D. 600 to 1700, with their peak from A.D. 1000 to 1350. He points out that Nanton points occur in Pictograph Cave III and at Ghost Cave (Mulloy 1958) in large numbers but their apparent absence from Pictograph Cave IV
suggests a decline in frequency in late times as is indicated at the Old Woman's Jump.

These dates fall within the time range assumed for occupation of the two bison drive sites (24PA308 and 24PA309) where most of the specimens of this type were found in the Upper Yellowstone.

**Comparable Specimens:**

- Forbis 1960, Fig. 12, n-r ................. Southern Alberta
- MacNeish 1954, Pl. 5, No. 4............... Manitoba
- MacNeish 1958, Pl. 7, Nos. 4,5,12-15...... Manitoba
- Mulloy 1958, Fig. 6, Nos. 35,36,38,39,
  34-48.................................. Southcentral Montana
- Wettlaufer 1960, Pl. 7, No. 5 ............. Southern Saskatchewan
- Taylor, 1964, Type XIV - B, Fig. 15-1;
  Fig. 16-a.............................. Yellowstone National Park

It should be noted that very similar projectile points are found throughout the Northern Plains, and in Southwestern Montana to the Idaho border, that may very well be of the same type. As well, the great variation in side-notched points from Idaho and the Great Basin called "Desert Side-notch" points may include many types familiar to the Northern Plains by different names.

A superficial examination of side-notched points in the Idaho State University Museum collections led me to the conclusion that many of the Idaho specimens would be difficult to distinguish from side-notched points found on the Northern Plains.

**Type XXI.** Small, triangular side-notched points (Figure 21, n-q).

These points conform to Forbis' (1960:99) "Paskapoo" type. Base width is equal to body width and the height of the basal edge is greater than notch width. Bases are either straight or slightly concave. The bases of these specimens are thinned but not ground, although Forbis (1960:99) states that this sometimes occurs. Flaking is by pressure technique and varies in quality.

**Sample:** Five specimens

**Material:** Obsidian, jasper

**Size:** All of these specimens are broken in some way. However, average thickness is 0.33 cm.

**Provenience:**
- 24PA301
- 24PA307
- 24PA308
- 24PA309
- 24SW201
Figure 21. Projectile points. a-b, Type XVII; c-f, Type XVIII; g-i, Type XIX; j-m, Type XX; n-q, Type XXI.
Forbis (1960:98) estimates the age of these points to be between A.D. 1000 to 1700, with their peak between A.D. 1350 and 1500. He comments that Paskapoo Points seem to be more common in Mulloy's (1958) Ghost Cave and Pictograph Cave III (thought to be nearly contemporaneous) than in Pictograph Cave IV, but that confirmation will require statistical analysis of Mulloy's specimens.

Comparable Specimens:

Forbis 1960, p. 99, and p. 97, Fig. 12,
I-M.......................... Southern Alberta
Lawrence 1953, p. 14, Fig. 3-d.......... Flathead Lake, Western Montana
Mulloy 1942, Fig. 22, Nos. 13-14,
Fig. 27, No. 13.................. The Hagen Site, Eastern Montana
Mulloy 1958, Fig. 6, Nos. 40 & 42,
Fig. 25, No. 2.................. Pictograph Cave
Mulloy 1958, Fig. 29, Nos. 1, 8, 9, 10,
13, 14.......................... Ghost Cave
Taylor 1964, Type XIV-G, Fig. 16,b,c...... Yellowstone Park
Thomas 1953, p. 18, Fig. 6, d ........ Flathead Lake, Western Montana
Wettlaufer 1955, Pl. 3, No. 5........... Mortlach Site, Saskatchewan

Type XXII. Small, triangular side-notched points (Figure 22, a-f).

Using Forbis' (1960:98) criteria, twenty-three specimens fit his description of "Pekisko Points". This type has a base wider than the blade by at least one millimeter, and the height of the basal edge is greater than notch width. Bases are straight or concave and sometimes ground. Notches are either acute or open, and blade edges are either straight or slightly convex.

Sample: Twenty-three specimens

Material: Obsidian, jasper, chert, quartzite

Size: Largest, Length: 3.6 cm.; Width: 1.5 cm.; Thickness: 0.3 cm. — Smallest, Length: 1.2 cm.; Width: 1.2 cm.; Thickness: 0.18 cm.

Provenience: 24PA308
24PA309
24PA321

Forbis (1960:98) estimates the time range for Pekisko Points between A.D. 1200 to 1700 with their peak between A.D. 1500 to 1700.
Comparable Specimens:

Forbis 1960, Fig. 12, D-H................. Southern Alberta
MacNeish 1958, Pl. 7, No. 6............... Southeast Manitoba
Mulloy 1958, Fig. 25, Nos. 7-9, Fig. 6
   Nos. 34, 37, 41, 49 .................... Pictograph Cave III &
   IV, Montana
Wettlaufer 1955, Pl. 1, No. 7............. Mortlach Site, Saskatchewan
Wettlaufer 1960, Pl. 7, Nos. 1, 2;       P.18,1............................ Long Creek Site, Southern Saskatchewan
   P.18,1............................ Southern Saskatchewan

Type XXIII. Small, triangular side-notched points with flaring bases
(Figure 22, g-j).

These points are similar to Forbis' (1960:97) "Washita Points"
but are characterized by removal of a notch from the center of the base.
Bases are flaring, always concave, and thinned.

Sample: Four specimens

Material: Obsidian, yellow jasper

Size: Less than 3.0 cm. in length; Less than 1.5 cm. in width;
   Average thickness: 0.2 cm.

Provenience: 24PA301
            24PA309
            24SW201

Comparable Specimens:

Mulloy 1942, Fig. 21, No. 11............. Hagen Site, Lower Yellowstone River
Mulloy 1958, Fig. 25, Nos. 1, 3, 5........ Pictograph Cave IV, Central Yellowstone River
Shumate 1950, p. 4........................ Vicinity of Great Falls, Montana
Strong 1935, Level III, Pl. 24.......... Signal Butte, Nebraska
Swanson, Tuohy, & Bryan 1959, p. 78..... Idaho Type 83, Central & South Idaho
Swanson, Powers, & Bryan 1964, Fig. 2,
   ii-mm, Desert Side-Notched points...... Southwestern Idaho
Taylor 1964, Type XV, Fig. 16, D........ Yellowstone National Park
Wettlaufer 1955, Pl. 1, No. 8............. Mortlach Site, Saskatchewan
Type XXIV. Small, triangular, unnotched projectile points (Figure 22, k-p).

These specimens have outcurving blades. Bases are concave, straight, or convex. All specimens are finely pressure flaked, often with retouching along blade edges. Bases are thinned and sharp. These artifacts are oval and generally very thin in cross-section.

Sample: Six specimens

Material: Obsidian, yellow jasper, agate, chalcedony, basalt

Size: Length of largest complete specimen is 2.8 cm. Length of smallest complete specimen is 2.0 cm. Average width is 1.46 cm. Average thickness: 0.26 cm.

Provenience: 24PA308
24PA309
24PA321
24SW201

Comparable Specimens:
Bliss 1950, Fig. 58....................... Birdshead Cave, Wyoming
Forbis 1950, Figs. 91-96, 99-101........ Missouri River, near Helena, Montana
Mulloy 1943, Fig. 20, 7-12.............. Red Lodge Site, Montana
Mulloy 1942, Fig. 24, 12-16............. Hagen Site, Lower Yellowstone River
Mulloy 1954b, Fig. 5, 2-1............... Shoshone Basin, Wyoming
Mulloy 1958, Fig. 11, Nos. 12, 13 & 15... Pictograph Cave, Montana
Shumate 1950, p. 4..................... Vicinity of Great Falls, Montana
Swanson, Tuohy & Bryan 1959, p. 74, 1-2.. South & Central Idaho
Swanson, Powers & Bryan 1964, Fig. 2,
d & f................................. Southwestern Idaho
Swanson, Butler & Bonnichsen 1964, Fig. 36,
11 mm., nn Birch Creek Valley.......... Eastern Idaho
Taylor 1964, Type XXI, Fig. 17, C-D..... Yellowstone National Park

Projectile points of this type found in Montana are associated with sites of the Late Prehistoric Period and are most often found in bone deposits of buffalo jumps.

Blades

As Taylor (1964:132) states, there is "no sure criteria for distinguishing between large projectile points, lance or spear heads, and
Figure 22. Projectile points. a-f, Type XXII; g-j, Type XXIII; k-p, Type XXIV.
chipping stone blades." Therefore, it is quite possible that some of the specimens included in this category may be projectile points, and probably have been classified as such by other investigators.

**Blades Modified for Hafting:** Artifacts included in this category consist of specimens in which the base is indented or notched. Notably absent are those blades (possibly knives) usually referred to as "corner tanged." Taylor (1964:138-139) reports three "corner tanged blades from Yellowstone National Park. Similar blades are found throughout Montana, many other parts of the Great Plains, and occasionally, Idaho. Although they are sometimes part of collections around Bozeman, Montana, only one specimen was observed in collections found in the Upper Yellowstone Valley. This specimen, from site 24PA303, was not available for illustration in this report.

**Type I.** Small, thin, triangular, unilaterally notched blades with straight edges and irregular straight bases (Figure 23, a-b).

This form is characterized by the deliberate removal of a single notch from one blade edge at a position usual to that of small side-notched projectile points. These specimens were pressure flaked, and bases were thinned but not ground.

**Sample:** Two specimens

**Material:** Obsidian

**Size:** Largest specimen (tip removed), Length: Approximately 3.3 cm.; Width at base: 1.3 cm.; Thickness: 0.3 cm.; Smallest specimen, Length: 1.55 cm.; Width: 1.2 cm.; Thickness: 0.22 cm.

**Provenience:** 24SW201

Mulloy (1942:46) reports a number of very similar specimens from the Hagen Site on the Lower Yellowstone River and states that "These may have been projectile points of a sort or, more plausibly, knives. They could have been hafted to bone or wooden handles laterally."
Type II. Indented base blades with excursive sides (Figure 23, c-d).

These specimens are pressure flaked with occasional retouching along the blade edges. The shallow indentation of the base was accomplished by percussion removal of one broad longitudinal flake or flute from both faces of the blade.

Sample: Two specimens

Material: Quartzite, mottled jasper

Size: One complete specimen. Length: 4.25 cm.; Width: 2.2 cm.; Thickness: 0.7 cm.

Provenience: 24PA302

Blades, with Plain Bases:

Type III. Small triangular blades (Figure 23, e-i).

These blades are all crudely percussion flaked. Three specimens show secondary pressure flaking, as well. Bases are generally straight but one specimen has a convex base. Bases are thinned.

Sample: Six specimens

Material: Yellow jasper, basalt, chert, quartzite

Size: Largest specimen. Length: 4.5 cm.; Width: 2.95 cm.; Thickness: 0.8 cm.; Smallest specimen, Length: 2.8 cm.; Width: 1.8 cm.; Thickness: 0.22 cm.

Provenience: 24PA302
24PA309
24PA313
24PA321

Type IV. Small, symmetrical blades shaped like isosceles triangles with slightly convex bases (Figure 23, j-l).

These specimens are percussion flaked with secondary flaking along the edges and the bases. Bases are thinned by pressure flaking and are sharp. There is no evidence of grinding along the edges or base. Specimens are thin and oval in cross-section.

Sample: Four specimens

Material: Jasper, quartzite
Figure 23. Blades. Blades modified for hafting. a-b, Type I; c-d, Type II. Blades with plain bases. e-i, Type III; j-l, Type IV.
**Type V.** Broad, symmetrical blades with wide straight bases (Figure 24, a–c).

These blades are carefully shaped and chipping is finely executed. Retouching is present on all specimens and bases are thinned. Neither the bases or edges are ground. These blades are characterized by a flaring outward from the base toward the tip. They are thin-oval in cross-section.

**Sample:** Five specimens

**Material:** Obsidian, quartzite, and yellow jasper

**Size:** All of these specimens are broken diagonally across the blade in a similar way, and dimensions are impossible to give.

**Provenience:** 24PA302

Type VI. Small, non-symmetrical blades with rounded bases (Figure 24, d–f).

These specimens have one blade edge that is straight or slightly convex with the opposite edge markedly convex. Flaking is even and the bases are thinned.

**Sample:** Five specimens

**Material:** Quartzite

**Size:** The tips have been broken from all the specimens, but they were approximately 5.0 cm. in length. Average width is 2.48 cm. Average thickness is 0.41 cm.

**Provenience:** 24PA302

Type VII. Thin, broad, triangular blades with convex bases (Figure 24, g-h).
Figure 24. Blades. a-c, Type V; d-f, Type VI; g-h, Type VII.
The edges of these blades are excursive and so are the bases. All of these specimens were percussion flaked.

**Sample:** Four specimens

**Material:** Obsidian, quartzite, basalt, chert

**Size:** Average Length: 6.8 cm.; Average Width: 4.1 cm.; Average Thickness: 0.76 cm.

**Provenience:** 24PA302 (3)
Random find (1) chert

Type VIII. Small, pyriform shaped blades with excursive sides and bases (Figure 25, a-c).

These specimens range from thin to thick in cross-section. They were blocked out by percussion flaking and retouched along the edges.

**Sample:** Five specimens

**Material:** Obsidian, agate, yellow jasper, basalt

**Size:** Average Length: 5.4 cm.; Average Width: 3.3 cm.; Average Thickness: 0.95 cm.

**Provenience:** 24PA302
24PA312

Type IX. Small, slender, bifacially flaked blades (Figure 25, d-e).

These blades range from thin to thick lenticular in cross-section. Tips at both ends of the blade are generally rounded. Flaking is by the pressure technique.

**Sample:** Seven specimens

**Material:** Quartzite, chert, agate, yellow jasper

**Size:** One complete specimen measures in Length: 5.95 cm.; Width: 1.75 cm.; Thickness: 0.7 cm.

**Provenience:** 24PA302
24PA309
24PA321
24PA329

Type X. Oval to pyriform shaped blades (Figure 25, f-g).
Figure 25. Blades. a–c, Type VIII; d–e, Type IX; f–g, Type X.
Specimens are haphazardly percussion flaked with the exception of one artifact. They vary from thin oval to thick oval in cross-section.

**Sample:** Five specimens

**Material:** Mottled yellow jasper, basalt, quartzite, siltstone

**Size:** The two complete specimens average 6.4 cm. in length.
   Average Width: 3.5 cm.; Average Thickness: 1.0 cm.

**Provenience:** 24PA302
24PA307
24PA312
24PA313
24PA321

**Plano-Convex Scrapers**

Artifacts included in this group are sometimes referred to as "thumb scrapers," "uniface scrapers," or "end scrapers". They are made from small chips usually flaked on one face only with the other face remaining untouched. Chips utilized may be thin or thick and often tend toward a vague triangular shape. The scraping end of the tool is most often convex but occasionally is straight. More often than not, only the scraping end is flaked, and this is done at a steep angle or bevel. Less often, other edges are worked, and occasionally, on thicker specimens, the whole back is flaked.

**Type I.** Thick scrapers with backs completely worked by pressure flaking (Figure 26, a-b).

**Sample:** Three specimens

**Material:** Agate, chert

**Size:** The smallest specimen is the only complete one of the three.
   Its dimensions are: Length: 2.5 cm.; Width: 2.3 cm.;
   Thickness: 0.95 cm.

**Provenience:** 24PA321
Figure 26. Plano-convex scrapers. a-b, Type I; c-d, Type II; e-f, Type III; g-i, Type IV; j-l, Type V; m-n, Type VI.
Figure 26. Plano-convex scrapers. a-b, Type I; c-d, Type II; e-f, Type III; g-i, Type IV; j-l, Type V; m-n, Type VI.
These scrapers were carefully flaked along the sides for the probable intention of hafting. Base ends were not flaked. One specimen shows some flaking on the dome or back. Two specimens are quite thick but the smallest of the three is only 0.4 centimeters in thickness and appears that it would easily break if hafted.

Sample: Three specimens

Material: Yellow jasper, fossil wood

Size: Largest, Length: 3.7 cm.; Width: 2.9 cm.; Thickness: 1.05 cm.; Smallest, Length: 2.85 cm.; Width: 2.25 cm.; Thickness: 0.4 cm.

Provenience: 24PA302

Type VII. Small, thin, lanceolate shaped scrapers (Figure 27, a-b).

These well shaped plano-convex scrapers were flaked along all edges but were not worked along the back. The two complete specimens, pointed at one end, are convex on the smooth face at the pointed end, indicating that this tip was to be used for some specialized kind of scraping. The entire scraping edges of all four specimens are sharp and show no evidence of having been used.

Sample: Four specimens (two complete and two broken straight across at mid-section).

Material: Agate, obsidian

Size: The two complete specimens, nearly identical in size, measure in length: (average) 2.9 cm.; Average width: 1.45 cm.; Average thickness: 0.3 cm.

Provenience: 24PA302
24PA321

Type VIII. Plano-convex scrapers, percussion flaked on the upper surface with broad percussion flakes removed from several edges on the basalar surface to form a cutting edge (Figure 27, c-d).

These artifacts appear to be multi-purpose tools. The dark flint specimen exhibits careful pressure retouching along the scraping edge. Both specimens have crude, uneven cutting edges.

Sample: Two specimens

Material: Flint, chert
Size: Maximum diameter: 4.7 cm.; minimum diameter: 3.4 cm.
Maximum thickness: 1.3 cm.; minimum thickness: 1.1 cm.

Provenience: 24PA302

Side Scrapers

Included in this category are thirteen examples. Their primary purpose was probably the scraping of hides. One specimen was bifacially flaked along one edge and unifacially flaked on the other, possibly to be used as a combination knife and scraper. All of these specimens appear to have been made from random chips of various sizes.

Type I. Side scrapers flaked along one or more edges. Edges are straight or excurvate. With one exception, flakes were removed from the specimen at a steep angle or bevel. None exhibit any shaping except along the edges (Figure 24, e-f).

Sample: Seven specimens

Material: Quartzite, basalt, chert, fossil wood, siltstone

Provenience: 24PA302
24PA305
24PA313
24SW201
24PA321

Type II. Unifacially flaked with wide, shallow incurving scraping edge (Figure 27, g-h).

Both specimens are either broken at one end or were possibly selected for flaking after they were broken. One specimen (quartzite) shows deliberate flaking along all edges to the point of the break to form a crescent shaped scraper. Similar specimens were reported by Taylor (1964:143) from Yellowstone National Park.

Sample: Two specimens

Material: Obsidian, quartzite

Provenience: 24PA302
24PA313
Figure 27. Plano-convex scrapers. a-b, Type VII; c-d, Type VIII. Side scrapers. e-f, Type I; g-h, Type II; i, Type III.
Type III. Small, unifacially flaked, ovoid side-scrapers (Figure 27, i).

These artifacts are flaked along three edges at a steep angle. However, the sides appear to have been the primary scraping edges.

Sample: Two specimens

Material: Obsidian

Size: Longitudinal axis: Length: Approximately 3.3 cm.
      Average width: 2.05 cm.; 0.85 cm.

Provenience: 24PA302

Cleavers (Figure 28, a-b)

Nine artifacts from the survey were included in this category. Seven specimens were bifacially percussion flaked, but were thick and crudely fashioned. All specimens exhibited some evidence of dulling from use. Eight specimens were made from quartzite. The remaining one made from basalt was the largest of those found and may have been utilized for scraping since it was unifacially flaked.

Three specimens were possibly cores rather than cleavers, but evidence of some battering along the edges made it necessary to classify them with cleavers.

The provenience of these artifacts were sites 24PA302 and 24PA313.

Cores

Among the occasional multi-faceted cores recovered during the survey were two polyhedral cores of obsidian (not illustrated). Both specimens were fashioned from obsidian nodules fractured in a manner to develop a flat surface at a right angle to the longitudinal axis of the nodule. Using the flat surface as a striking platform, blades or
Figure 28. a-b, Cleavers or choppers; c, Pestle.
flakes were removed from the long axis of the core. (Proveniences of these two specimens were 24PA302 and 24PA329.)

**Perforators or Drills** (Figure 29, a-e, g)

These implements were used presumably to perforate hides and for drilling holes in wood, bone, and shell. Of seven specimens found, only three were complete. Although the bases vary considerably in shape, perforators are characterized by the drill portion tapering from the base to the tip. One specimen was made from a large flat obsidian chip, and the wide base was unifacially flaked to form a scraping edge. (Figure 29, a).

Occasionally, perforators have been found in Montana that were notched for hafting. None of the specimens reported here are notched and probably were held in the hand rather than hafted.

Dimensions of the complete specimens are:

<table>
<thead>
<tr>
<th>Figure 29, b</th>
<th>Maximum Length</th>
<th>Maximum Width, Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>29, c</td>
<td>4.3 cm.</td>
<td>2.0 cm.</td>
</tr>
<tr>
<td>29, d</td>
<td>2.45 cm.</td>
<td>1.74 cm.</td>
</tr>
</tbody>
</table>

Proveniences: 24PA302  
24PA313  
24PA329

**Drill-Scrapers or Gravers** (Figure 29, h-i)

Included are three specimens difficult to classify. The chips used appear to have been randomly selected. The working end consists of a short projection tapering to a rounded tip. Minute flakes were unifacially removed from the tip, and the underside is flat. The tips are thin and appear delicate, suggesting that use of these implements was short lived.
Figure 29. a-e, g, Perforators or Drills; f, h-l, Drill-Scrapers or Gravers.
Specimen _f_ was a multipurpose tool with the base modified for use as a plano-convex scraper, and the opposite end or tip may have been a graver.

Specimens _h_ and _i_ have wide tips (nearly as wide as the projecting portion) and probably are not gravers. The latter two specimens exhibit some evidence of unifacial flaking along the edges.

Artifacts similar to these were reported by Jennings (1957:167) from Danger Cave in Utah.

**Ground Stone Artifacts**

Included in this category were those artifacts formed by pecking or grinding. Many artifacts of this category were observed in collections reportedly found in the Upper Yellowstone, but were not recovered during the survey. Observed artifacts included ungrooved mauls, grooved mauls (three-quarter grooved and fully grooved types), conical pestles, tubular steatite pipes, manos, and sandstone abraders (shaft-smoothers). Ground stone artifacts recovered during the survey were a large fragment of a steatite vessel, a broken metate, and three edge-ground cobbles.

**Steatite Vessels (Talc, Soapstone):** A number of steatite vessels have been recovered in the Upper Yellowstone country in historic times. Norris (1882:777) reported four specimens found within Yellowstone National Park. These specimens were flat bottomed and stood about one foot high with exterior diameters across the mouth that ranged between five and eleven inches. Body walls were thick, and vessel bottoms were much thicker.
Wedel (1954:404 Figure 118) illustrated three more very similar vessels from in and around Yellowstone National Park.

Brown (1932:81) reported a steatite vessel reputedly found in the campsite (24PA308) at the Emigrant Bison Drives near Emigrant, Montana.

More recently, Taylor (1964:148) reported a soapstone vessel that was found on Deckard Flat near Gardiner, Montana, and given to the Yellowstone Park Museum at Mammoth in August of 1961. According to Taylor (1964:148):

National Park Service reports indicate that it measured 7 inches in height and 7 inches in diameter; it was 'remarkably symmetrical and well proportioned.' The pot's outer surface was blackened indicating exposure to fire and probable use as a cooking utensil.

During the present survey a large vessel fragment of steatite was found exposed in the bottom of Billman Creek west of Livingston at the Art Miles' Ranch Site (24PA324) (Figure 30). This fragment measured a rather uniform thickness between one and six tenths and one and eight tenths centimeters. The shape of the original pot was oval rather than circular. The rim was rounded. The vessel is straight sided and the diameter of the mouth was probably the same as the interior bottom. Although the bottom portion is missing, the incurring interior surface (Figure 30, b arrow) denotes the interior bottom of the vessel and gives some indication of its former height that is estimated to be between eleven and twelve inches.

Striations on both the inner and outer wall of the vessel are vertical, but from the lip to about two inches below, the exterior striations are horizontal (Figure 30, c), and often, nearly obliterate
the vertical marks. On the inside lip the horizontal striations extend downward in the vessel no more than an inch. The striations indicate something of the vessel's manufacture, but there may also be a relationship between the horizontal striations along the rim and the transporting of the vessel and/or its very likely culinary use. The exterior surface is charred from repeated placement in a fire. Fire had also made the specimen very hard.

The presence of a roughly rectangular lug five centimeters below the lip of the vessel was somewhat unusual (Figure 30, c). It measured two centimeters in length, one centimeter in width and was raised a mere four tenths of a centimeter in height. Immediately above the lug between the lug and the rim where the shadow of the lug appears in Figure 30, c, there appears a band, nine centimeters long and one and five tenths centimeters wide, that is slightly indented or perhaps worn into the outer wall of the vessel. The horizontal striations are pronounced along this portion of the vessel's exterior and suggest relationship to the lug for possible support during use or in transporting the vessel. However, none of the reports of steatite vessels mention lugs or holes used to support or carry them, and none of the steatite fragments and pots observed have had lugs or holes drilled in them. Occasionally pottery from other parts of Montana contains holes drilled near the rims. Whether such holes were for repairing minor fractures or for transporting pottery vessels has never been adequately answered.

Historic accounts of the use of steatite vessels among the Shoshoni are several. Wedel (1954:407) reported that Laroque in 1805 recorded
Figure 30. Ground Stone. a. Large fragment of a steatite vessel, exterior view (note lug at upper right edge of vessel); b. Interior view of same fragment, (arrow - note incurving interior beginning to form base of pot); c. Close up photo lug, (note horizontal depression above lug).
observing among the Shoshoni, a pot hewn out of solid stone with no
other instrument than a piece of iron, and that, in 1848, Nathaniel
Wyeth had seen a very similar stone pot among the Indians of the Snake
River. Perhaps Lewis and Clark's report of them in use among the Lemhi
Shoshoni in 1805 was most specific:

... their culinary eutensils exclusive of the brass kettle
before mentioned consist of pots in the form of a jar made
either of earth, or of a soft white stone which becomes
black and very hard by burning, and is found in the hills
near the three forks of the Missouri between Madison's and
Gallatin's rivers ... (Thwaites 1904-05:Volume 3, 119).

From the source mentioned in this quotation, there can be little
doubt that Lewis and Clark were referring to talc (Soapstone, steatite).
Today, the several large sources of this mineral, located in Madison
and Beaverhead Counties, comprise the only known deposits in Montana of
sufficient size to have provided a source for the Indians. A large
deposit of this mineral is found at the southern end of the Big Horn
Mountains in Northern Wyoming and another deposit is rumored to exist
in the Teton Range south of Yellowstone National Park.

Manos and Metates: Grinding stones that can be recognized readily as
such are rarely found in the Upper Yellowstone. The few observed exhibit
minimal use and are poorly defined in form and shape when compared to the
well worn manos and deep basined metates of the Southwest. Taylor (1964:
157-160) reported three metates that were in the Yellowstone National
Park Museum collections and presumably were found within the Park.

A broken metate (Figure 31, a), was recovered during the survey
from the Art Miles' Ranch Site (24PA324). The material is a hard and
highly consolidated sandstone. Rather than a deeply worn depression, the stone is worn smooth with a barely perceptible depression from the edges toward the center and toward the fracture (Figure 31, a). Stria­tions run lengthwise from the fracture to the opposite end. The opposite face is very rough and uneven. Along the edges appear what may have been an attempt to shape the metate to its present form, although this could have occurred from use or from natural causes.

Dimensions of this specimen are:

Length (from center of break to opposite edge): 19.4 cm.;
Width (across line of break): 16.3 cm.;
Thickness: Varies between 2.2 and 2.8 cm.

Edge—Ground Cobbles (Figure 31, b-d): Stone implements known as edge­ground cobbles have been recovered from many sites in the Yellowstone River drainage. Mulloy (1943) referred to them as "tanning stones," and they were described by Oscar Lewis (1944:336-338) as:

Roughly oval and range in size from 4 1/2 to 8 1/2 inches long, 2 1/2 to 4 inches wide, and 3/8 to 1 1/2 inches thick. Some are worn with a single bevel on one edge, some with a single bevel on both edges. Some have a double bevel on one edge, some have it on both edges. All show striae crossways. Some show a very high hand polish from use. All are made from stream boulders of various kinds: Diorite, granite, biotite granite, horn blended granite, quartzite, felsite, basalt, and a very hard limestone with fossils in it.

Although the length and width of specimens reported by Lewis and others from the Central and Lower Yellowstone Valley correlates with specimens from the Upper Yellowstone, the shape is not always oval. Often, much thicker three and four sided stream cobbles were utilized.
Three specimens were found at two sites during the survey. One oval shaped specimen (Figure 31, b) was excavated from 24PA302 (Carbella Bridge Site) with artifacts associated with Mulloy's Late Middle Prehistoric Period. Two other specimens were picked from a plowed field at 24PA324 (Art Miles' Ranch Site) (Figure 31, c and d).

Dimensions of these specimens were: (Figure 31)

b. Length: 12.4 cm.; Width: 5.6 cm.; Thickness: 4.2 cm.  
   Material: Schist

c. Length: 18.8 cm.; Width: 9.3 cm.; Thickness: 3.8 cm.  
   Material: Granitic schist

d. Length: 19.6 cm.; Width: 7.2 cm.; Thickness: 6.5 cm.  
   Material: Unknown

Several other similar specimens were observed in collections from the vicinity of Big Timber, Montana.

Lewis (1944:336-338) listed thirteen sites ranging geographically from Roundup, Montana, south into Wyoming along the Beartooth Range where edge-ground cobbles were recovered. Mulloy has since extended this distribution southeastward into Eastern Wyoming and has seen examples from Alberta (Warren, Bryan, Tuohy, 1963:12). Butler (1962:45) reported specimens having been found in Colorado. Along the Lower Yellowstone, Nelson (1943:167) recorded one tanning stone from an excavation along Sage Creek, and Mulloy (1943) recorded ten specimens from the Red Lodge Site. In both excavations, stratigraphic context was either absent or obscured. However, Mulloy (1958) reported one "tanning stone" from Pictograph Cave I, temporally placing the specimen in the Middle Prehistoric Period.

Sites west of the Rockies have yielded numerous edge-ground cobbles, dating much earlier than those reported from the Plains. At Five
Mile Rapids near the Dalles on the Oregon side of the Columbia River, Cressman excavated a site continuously occupied during the past 11,000 years. From levels radiocarbon dated between 9,000 and 6,000 B.C. were removed a concentration of tanning stones representing seventy-two percent of this artifact recovered at the site. Nineteen percent were recovered from levels dating between 6,000 and 2,500 B.C. with the remainder of nine percent from levels dating about 2,500 B.C. to about the time of Christ.

Other sites, distributed from the Dalles to the Snake River, up the Snake River into Idaho, and along the Snake River Plain to the north, have yielded edge-ground cobbles. Northeast of Missoula, Montana, and west of the continental divide three specimens were recorded as surface finds. Over a hundred edge-ground cobbles have been found in the Gallatin Valley near Bozeman, Montana.

A movement of this trait from west to east is indicated by its early appearance on the Columbia River, whereas, in the Northern Plains, edge-ground cobbles found in stratigraphic context belong primarily to Mulloy's Late Middle Period, and may date as late as A.D. 500 (Warren, Bryan, and Tuohy 1963:12).

Polished Stone: Certain stone artifacts recovered from Yellowstone Valley sites must be classed as polished stone. Steatite tubular pipes nearly always exhibit an exterior surface polish, and infrequently, stone axes show a deliberate overall polish unobtainable through normal use.

During the survey, a single polished artifact, believed to be a pendant, was recovered in three pieces from a burial site, 24PA312,
Figure 31. Ground Stone. a, metate, broken; b-d, edge-ground cobbles. Polished Stone. e, pendant.
(Figure 31, e). The mottled gray stone used was not a soft material and the pieces were recovered only because of their eye catching lustre. The specimen is thin and measured two and five tenths centimeters in length.

**Pottery**

The limited pottery sample from the Upper Yellowstone was gathered from three sites: 24PA301 (Eagle Creek Site), 24PA308 (Emigrant Campsite), and 24PA324 (Art Miles Ranch Site). Although pottery occurs somewhat rarely in the Upper Yellowstone, and a total limited sample of twenty-eight sherds prevents reconstruction of any complete pots, recovery was sufficient to allow some comparisons with pottery reported from elsewhere in this region.

**24PA301 (Eagle Creek Site):** The pottery sample from 24PA301 consisted of fifteen sherds that included one large base sherd, two rim sherds, and twelve body sherds, all believed to be from the same vessel. Thirteen sherds were surface recoveries from a limited area of the site. The two remaining sherds were recovered in situ from Level I (Ibid, p. 35).

Body sherds varied between eight tenths and one centimeter in thickness. Exteriors were buff colored with this color penetrating from four tenths to six tenths of a centimeter into the core. The core and interior surface was dark gray to black. Hardness was about three on Moh's scale.

Temper consisted of crushed granite rock particles (mostly feldspar and quartz) that varied from five tenths of a millimeter to two
millimeters in diameter, and occasionally ranged to four millimeters in length.

The outer surface exhibited a coarse grainy texture smoothed possibly by hand as indicated by finger nail indentations. The interior appeared to have been finished in the same way.

The two small rim sherds (Figure 32, a) measured seven and five tenths millimeters wide at the lip and thickened to nine millimeters at a point one centimeter below the lip. The lip was flat with a slight thickening along the exterior edge as if the pot had been placed upside down on a flat surface to dry (Mulloy 1958:197). Excess clay was wiped away from the outer edge of the rim probably by use of both a small stick and finger nails.

The large base sherd varied in thickness from one centimeter to one and two tenths centimeter. Emerging from the base, the vessel wall or body thinned to a thickness of seventy-five hundredths centimeter. A slight flange protruded from the base, and where the base merged upward into the body of the vessel, it began to flare outward (Figure 32,b).

As indicated by the base sherd, the complete pot measured very close to nine and five tenths centimeters in diameter across the base. The rim sherds provided less of an arc to determine the rim diameter, but the complete vessel measured approximately twenty-one centimeters across the mouth. Height of the pot was undeterminable.

24PA308 (Emigrant Campsite): This sample consisted of six small body sherds that may have been part of several pots. These sherds were thinner than those from 24PA301 and varied between five millimeters to six
and five tenths millimeters in thickness. The sherds were buff colored with a reddish-tan color penetrating to the interior wall. The interior surface was gray colored and on the largest sherd was marked by several black smudges. Hardness was about three and one half.

Temper consisted of granitic particles that included plagioclase feldspar, quartz, and both biotite and muscovite mica. Hematite was present in the clay. Particle size ranged from medium to coarse or twenty-five hundredths of a millimeter to one millimeter.

As indicated by the two larger sherds, the pot was built up by hand modelling and shaped by the paddle and anvil technique. From the grainy texture of the interior surface, and the broad, shallow indentations, it appeared that the heel of the hand may have served as an anvil. The much smoother outer surface was paddled with a smooth flat object, possibly a stick.

24PA324 (Art Miles' Ranch Site): The five sherds from Art Miles' ranch were picked from a plowed field by Mr. Miles. Other surface finds collected from the site by Mr. Miles included an almost complete array of lithic materials found in the Upper Yellowstone. Among the specimens were projectile points that ranged from McKean Lanceolate points through corner-notched points to a predominance of obsidian side-notched points. Scrapers, knives, perforators, a broken metate, several possible manos, two pestles, an edge-ground cobbles, a grooved maul, one complete side of a steatite vessel, and pottery completed the assemblage.

Of the five sherds, the two largest were rim sherds and the other three were body sherds (Figure 32, e-f). Thickness ranged between nine and eleven millimeters.
Exteriors were buff colored with this color penetrating up to five tenths of a centimeter into the core and changing to black on into the interior surface. However, the buff color thinned out higher up on the rim sherds to become absent about one centimeter below the rounded rim.

Temper consisted of feldspar, muscovite mica, and very little quartz. The clay contained a high proportion of hematite. Sherd hardness was about three.

The body sherds exhibited an exterior surface gloss due to natural qualities of the clay that was used. When it had dried to a degree of leather hardness, the exterior was smoothed, possibly with a stone. The interior surface showed long horizontal striations that indicated smoothing was accomplished by a hard object with a long uneven edge, possibly a stone blade.

Size of the pot was impossible to determine, but the arc of the largest rim sherd indicated an original rim diameter of approximately twenty-two centimeters.

According to Miss Frances Senska, ceramist at Montana State University, who examined the sherds, those from the Eagle Creek Site and the Art Miles' Ranch Site were fired at low temperatures, probably in an open fire, but with much smoke involved. Oxidation was incomplete.

Pottery described in this report from sites 24PA301 (Eagle Creek Site) and 24PA324 (Art Miles' Ranch Site) is believed to be of the type originally defined as "Intermountain Tradition" by Mulloy (1953:196-203). The inadequate sample from 24PA308 (Emigrant Campsite) prevents its inclusion in the Intermountain Tradition at the present time.
Pottery of the Intermountain Tradition type may be described as flat bottomed, generally with a slight exterior flange at the base, straight, outflaring sides that generally bend inward toward the center at the rim, giving a globular appearance, but may be flower pot shaped, and with flat or rounded undecorated rims. Paste tends to be somewhat coarse, and temper consists of medium to coarse particles. Thickness of walls varies considerably. Surfaces are generally rough with occasional striations both outside and inside. Color varies from gray to buff, tending more toward buff, but may be blackened by fire. Firing is quite variable. "No handles, holes, or decorations are known (Mulloy 1958:198)."

Sherds of this type have been reported in association with Mandan-Hidatsa pottery from the Central and Lower Yellowstone Valley (Mulloy 1958; Nelson 1943), and with Great Falls ware (Shumate 1950) from the vicinity of Great Falls, Montana. However, these locations are most likely peripheral for both types. From the Upper Yellowstone, Intermountain Tradition pottery remains as the only type reported (Mulloy 1958; Taylor 1964), and, at present, the only type known to have been found there. West of the Upper Yellowstone, the scant pottery recovered from the Gallatin and Madison Valleys is of the Intermountain type and suggests the possibility that this pottery may extend by way of Beaverhead County into southern Idaho.

Distribution of Intermountain Tradition pottery (Mulloy 1958:199) "as it is known archaeologically at present extends from the Great Falls area of Montana southward into the Wyoming Basin and thence westward into the northeastern Great Basin."
Figure 32. Pottery. a, rim sherds, 24PA301; b, base sherd, 24PA301, (note flange - arrow); c, rim sherd, Intermountain Tradition ware from vicinity of Great Falls, Montana; d, rim section of steatite vessel; e-f, rim sherds, 24PA324, (note similarity to d).
More recently, Intermountain Tradition pottery has been reported by Gebhard, et al., (1964:361-362) from Horned Owl Cave near Laramie in southeastern Wyoming. At present this is believed to be the southernmost occurrence for this type of pottery along the east slope of the Rockies.

In Idaho, Schellbach (1930:123) and later, de Laguna (1947:247) reported flat-bottomed pottery from along the Snake River in southern Idaho. From western Utah Rudy (Mulloy 1958:198) reported similar ware. A sample of flat-bottomed pottery was found near Glenn's Ferry, Idaho, and identified by Tuohy (1956) as "flat-bottomed Shoshoni ware". In the same article, Tuohy (1956:67) stated:

... that the predominant vessel form from the state of Idaho is the flat-bottomed, basal-flanged, undecorated, cooking pot. Only ten sherds indicate the possibility of other forms within the state.

The predominance of the flat-bottomed vessel form and the absence of decoration set the Idaho specimens apart from some of the Shoshoni ceramics of western Utah and eastern and southeastern Nevada. Shoshoni ware sherds from western Utah include jars with pointed bases (i.e., conical) as well we 'flower pot' forms. This collection also includes sherds with fingernail impressions vertically placed in horizontal bands just below the rims, and some which have overall indentations (Rudy 1953:94 and Figure 58a). In all other respects, the ware is similar to the Idaho specimens.

There is ample ethnographic evidence that the Shoshoni made pottery in late prehistoric and early historic times (Steward 1941:242; Stewart 1941:435 and 1942:341). As well, Lewis and Clark observed pottery among the Lemhi Shoshoni in 1805 (Wedel: ibid).

According to Teit (1930:304-305), Shoshoni bands ranged over the Yellowstone drainage, northward from its headwaters in Yellowstone Park
to the country east of Billings, Montana, and north on the Missouri drainage to Fort Benton and perhaps as far as the Sweet Grass Hills near Havre, Montana. Pottery of the Intermountain Tradition type has been reported from as far north as Great Falls, Montana (Shumate 1950: 15-16), and from east of Billings, Montana (Mulloy 1958), mixed with other wares, but always within territory believed to have been occupied formerly by the Shoshoni.

The Milk River Archaeological Society, working north of Havre, Montana, during the summer of 1965, reported to the writer a single base sherd of flat-bottomed pottery as part of a large sample of mixed Plains wares. Whether the single sherd represents Intermountain Tradition pottery remains to be ascertained.

Mulloy (1958:200) tentatively attributed flat-bottomed Intermountain pottery to the Shoshoni and stated:

The Shoshoni have already been suggested as its authors and they may have been responsible for some of it, but the writer feels that there is a distinct possibility that it represents a regional style, probably with many variants which have not yet been recognized, which was participated in by several different tribes.

Several different tribes to which Mulloy looked for support as probably having made flat-bottomed pottery were the Sarcee, Kutenai, and Blackfeet (Mulloy 1958:200).

Ewers' (1945:289-299) excellent summary presented the known evidence for pottery manufacture among the Blackfoot. However, later attempts to relate this evidence to the pottery of southern and eastern Montana and into Wyoming prompted Wedel (1954:406) to remark that:
Schaeffer (1952, p. 8) is apparently convinced that the Blackfoot, Kutenai, and Sarri wares had their source in northwestern Plains ceramics; and presumably he would include here the Gros Ventre pottery as well. He may be right; but to me the steps by which these tribally identified wares developed from the demonstrably or probably earlier ceramics of the Montana-Wyoming region and eastward are by no means clear.

For the Sarcee and Kutenai, Griffin (1965:242-243) emphasized that clay containers do not become pottery until they have been fired. Lack of a genuine "corpus delicti" combined with generally improbable techniques of manufacture casts serious doubt that the Sarcee and Kutenai made pottery, although the ethnographic evidence indicates that they made perishable unfired clay containers.

Related to pottery manufacture among the Blackfeet were the earthenware pots that Matthew Cocking observed among the Gros Ventre during the years 1772-1773 (Griffin 1965:240). At this time the Blackfeet were believed to have been in east-central Saskatchewan, moving westward. "Lewis suggests that soon after 1775, the Blackfoot gave up the manufacture of pottery due to the acquisition of kettles from white traders (Griffin 1965:238)."

As in the case of the Sarcee and Kutenai, lack of genuine specimens of Blackfeet pottery coupled with improbable techniques of manufacture led Griffin (1965:241) to conclude that although the Blackfeet:

... probably had made pottery in the past ... Individuals such as Cocking, who saw pottery in use by the Blackfoot or closely related tribes, were probably observing the last expression of pottery manufacture while the traditional and informants versions of pottery production are pitifully inadequate and in some cases, impossible to believe.
If this assessment is correct, then the Blackfeet apparently had given up pottery manufacture prior to or about the time of their first contact with the Shoshoni.

Moreover, it is highly improbable that a group located in east-central Saskatchewan in the 1770's and in the process of giving up pottery in favor of kettles, would have had any connection with the flat-bottomed pottery of an Intermountain Tradition, probably extant at that time, extending south from Great Falls, Montana, to west of the continental divide into southern Idaho and the Great Basin.

If we may eliminate the Blackfoot, Kutenai, and Sarsee as contenders in the manufacture of Intermountain Tradition pottery, the field narrows to the Shoshoni and the Crow.

Mulloy (1958:195) says:

There is strong likelihood that the pottery of the Mandan-Hidatsa tradition in Montana and Wyoming is prehistoric and early historic Crow. A good deal of evidence suggests that the Crow formerly lived with the Hidatsa on the Missouri in North Dakota and in late prehistoric times moved westward up the Missouri and Yellowstone to their historic location (Mulloy 1958:195).

Whether the Crow manufactured the Mandan-Hidatsa tradition pottery associated with Intermountain ware from the Central Yellowstone sites near Billings, Montana, remains unresolved. However, it is unreasonable to believe that the makers of Mandan-Hidatsa tradition pottery would switch suddenly to the manufacture of a distinctly different pottery form that was decoratively inferior to their own.

Furthermore, distribution of Intermountain ware does not conform to known movements of the Crow. Therefore, that the makers of Mandan-Hidatsa Tradition pottery made any of the Intermountain Tradition pottery
seems as unlikely as that the makers of Intermountain Tradition pottery made the other.

West of the continental divide in the Montana Western Region, none of the historic tribes, with the possible exception of the Kutenai, made pottery. Thus far, archaeological investigations in the region have failed to turn up a single potsherd.

Lewis and Clark observed pottery among the Shoshoni in 1805, so that Shoshoni manufacture of pottery, and steatite vessels as well, can hardly be questioned. On the strength of their observation it must also be presumed that the Shoshoni made pottery prior to 1805.

Distribution of Intermountain Tradition pottery falls within territory presumed to have been formerly occupied by the Shoshoni. Single isolated fragments of flat-bottomed pottery, possibly of Intermountain type, from such locations as the Sheyenne-Cheyenne site near Lisbon, North Dakota (Mulloy 1958:201), or from near the Canadian border north of Havre (Leslie Davis, personal communication) are interesting but not necessarily meaningful. Such unique overlappings might easily be accounted for by forays into contested or enemy territory, or as Mulloy (1958:199) says:

The juxtaposition of such distinct styles might well have been due to the practice of stealing foreign women who would continue to make the pottery with which they were familiar or to intermittent occupation of camp sites by different groups.

A classic example of a captured foreign woman was Lewis and Clark's Shoshoni guide, Sacajaweha, who had been captured some years before by the Mandan near the three forks of the Missouri River.
Strong similarities between pottery of the Intermountain type and the flat-bottomed "Shoshoni" ware from southern Idaho as described by Coale (1963:1-11), Tuohy (1956:55-71), and from parts of the Great Basin as described by Rudy (Mulloy 1958:199) and by Steward (1938) leaves little doubt of affiliation.

For final consideration is the earlier reference to Lewis and Clark who credited the Northern Shoshoni with the manufacture of both earthenware and "soft white stone" vessels, that from the location given for the source of the stone can refer only to steatite.

Strong similarities of form between Intermountain type pots and steatite vessels, as manifest in flower pot shapes, flanged, flat-bottomed bases, and lack of decoration, strongly suggest direct influence of one on the other. They may, as Wedel (1954:408) says, "... reflect the same form concepts carried over into, if not transferred from, another medium."

In conclusion I must agree with Wedel (1954:406) that:

In any case, it would appear that the evidence lends some support to Mulloy's tentative attribution of the flat-bottomed ware to the Shoshoni. I am tempted to go a step further and suggest that the bucket-shaped vessels reported from the Snake River in southwestern Idaho and the somewhat differently shaped, but also flat-bottomed, pieces from Billings and Coff Creek may be band or tribal variants of a single widespread flat-bottomed ware with Shoshonean affiliations.

And Ibid. (408):

Since Shoshonean peoples are believed to have been the late prehistoric and protohistoric occupants of the upper Yellowstone-Missouri headwaters-Snake River region, and since early historic Shoshonean peoples here are known to have used both earthen and steatite vessels, there is presumptive evidence that they were the makers of the pieces in question.
CHAPTER V

CONCLUSIONS

Early Prehistoric Period (ca. 11,000 to 5,000 B.C.)

Among anthropologists the Rocky Mountains have been treated as a barrier between cultures on either side, thereby imposing restrictions on the understanding of cultural relations in the Rocky Mountain Region (Swanson 1966:1). According to Swanson (1966:1), this has led to such "doctrines of separation" as the Desert Culture (Jennings and Norbeck 1955), and the restricting of fluted points east of the Rocky Mountains (Agogino and Rovner 1964), so that the Rocky Mountains have been accepted as a refuge area with cultural relations moving toward the Rockies from both sides. An alternative advanced by Swanson (1966:1) is to "... assume that the Rocky Mountains was a homeland instead of a barrier between cultures and peoples." Evidence is available to support such an assumption.

In the past, anthropologists have considered the Rocky Mountains as the place where the high plains end and the mountains simply replace them, apparently forgetting that the mountains are interlaced with a vast network of valleys. For example, the Upper Yellowstone River drainage presents a gradual change that grades from high plains into the mountain valleys and open parklands of Yellowstone National Park to the continental divide, and thence into the Snake River Plain in Idaho. Swanson (1962:154) spoke of the Snake River Plain as a plains-like setting that grades imperceptibly into the valleys of the Central
Rockies. East of the continental divide the same is true for the Upper Yellowstone Valley, and the Gallatin, Madison, Jefferson, Beaverhead, and Centennial Valleys west of the Yellowstone. For they gradually merge into a vast network of mountains and valleys with those of the Beaverhead and Lemhi Mountain Ranges and with Birch Creek and the Snake River Plain along the continental divide in Southwestern Montana and Eastern Idaho.

According to Swanson (1966:1), Daubenmire (1943) proposed that the Rocky Mountains are part of a vast ecological network that extends from the Black Hills on the east to the Cascade Range and Sierra Nevadas on the west. Within this ecological network, should also have existed a network of human relations based on close adaptation to the environment, so that common human events and common cultural manifestations should be expected on both sides of the Rocky Mountains (Swanson 1966:1).

Increasing archaeological evidence tends to support this view. From the Upper Yellowstone drainage, archaeological evidence for early man has been in the form of projectile points recovered off the surface. These are typologically identical with specimens found in stratified and dated sites in surrounding regions. The number of finds has increased to a point where they cannot be dismissed as having been brought into the area by later Indians. Seven types of Early Period points have been found at various sites in Southwestern Montana, and include: Clovis, Folsom, Midland, Agate Basin, Hell Gap, Scottsbluff, and Eden points.

Although these point types usually have been associated with the eastern slope of the Rocky Mountains and with the Great Plains, they
have been found, as well, with the possible exception of Midland points, west of the continental divide in Idaho (Butler 1963; 1965; Butler and Fitzwater 1965; Swanson 1961).

For example, Clovis points have been reported from every state west of the continental divide. The Simon Site (Butler 1963) on the Snake River Plain of Idaho yielded an assemblage of Clovis points nearly identical to those from the Dent Site (Wormington 1957) in Colorado. Swanson (1961) reported fifteen Folsom stations, and Agate Basin and Eden points, as well, from the Snake River Plain. East of the continental divide, Jasmann (1963) reported Clovis and Folsom points from Madison and Beaverhead Counties, in Southwestern Montana. Forbis and Sperry (1952) excavated Folsom and Scottsbluff points from the stratified MacHaffie Site near Helena, Montana. Later, Taylor (1961) reported Clovis points and a probable Plainview point from the Strickland Site near Great Falls, Montana. A large fluted point, a Midland point and a fragment of a Folsom point have been found near Bozeman, Montana. Representative specimens of most of these projectile point types have been recovered from Lower Yellowstone River Valley sites in Eastern Montana (Mulloy 1958; Mulloy 1943; Mulloy and Lewis 1943).

Pertinent also are the similarities noted by Warren, Bryan and Tuohey (1963) between Hell Gap points from Northern Wyoming and Lind Coulee Style I points from the State of Washington. Taylor (1964) reported Hell Gap points from Yellowstone Park, and several other very similar specimens have been recovered from the surface in different localities in Southwestern Montana.
Throughout Southwestern Montana and extending into Idaho is an almost continuous chain of Early Period artifacts, inferentially suggesting that similar environments and events existed during this period on both sides of the Rockies as well as throughout the mountains.

During the Early Prehistoric Period there is evidence that Early Hunters not only found suitable occupation in the high valleys of the Rocky Mountains but on the mountain tops as well. "Mountain Top" archaeology in the Rocky Mountains began with the work of Wendorf and Miller (1959) in the Sangre de Cristo Mountains of New Mexico where six sites were discovered at elevations above 11,000 feet. Specimens ranged in time from the Early Prehistoric Period to about A.D. 1500. In the high mountains of South-Central Idaho, Swanson, Tuohy, and Bryan (1959) recorded many sites. In Colorado, Husted (1965) reported Agate Basin, Meserve, and Cody Complex artifacts from the Colorado Front Range that were found at elevations above 11,000 feet.

From the Absaroka Range north of Yellowstone National Park, at elevations exceeding 9,000 feet, Haines (1963:mss.) reported 150 locations that yielded artifacts. Specimens included a Hell Gap Point and the basal half of an Eden point. Two Agate Basin points were reported by Mr. Otho Mack, from high elevations in this same mountain range. Interestingly, these four specimens and other lanceolate points were found on high ridges rather than in high mountain valleys, suggesting the possibility that Early Hunters were skirting Pinedale valley glaciers and snow fields where they were probably hunting.
Equating "Homeland" with cultural mastery over the environment, or where culture permitted successful exploitation of the natural environment of an area, another alternative may be postulated for understanding Early Man's presence in the Rocky Mountain Region. With artifacts, associated with 10,000 years of occupation, found throughout this region, the Rocky Mountains were not a barrier to cultural relations. This is evidenced in historic times, at least, by known movements of the Northern Shoshoni, Nez Perce, and Bannock, the bison hunters who moved back and forth from west of the continental divide in Idaho to the high plains of the Yellowstone and east on their annual bison hunts (Haines 1964; Teit 1930). That the Rockies did not constitute a barrier to Early Man, either, is indicated by common Early Period artifact forms throughout the region.

Furthermore, it is difficult to understand the Rockies as a barrier when adaptation to the mountains is demonstrated by the Tukudika or Mountain Sheepeater Shoshoni who apparently found Yellowstone National Park a permanent, year round homeland. As well, the Flathead, Kutenai, and Pend d'Oreille apparently found the Montana Western Region a suitable homeland in late prehistoric and historic times.

Rather than a ragged native, with spear in hand, racing down the "Old North Trail" to warmer climes, many of these Early Hunters may have remained in the intermountain region of what is now Montana. With Early Man occupying the high plains, the high mountain valleys, and the mountain tops, it may also be that seasonal migration patterns became established in this region during the Early Prehistoric Period.
Middle Prehistoric Period (ca. 4,000 B.C. to A.D. 500)

For most parts of the Northwestern Plains and the Rocky Mountains very little is known through direct archaeological evidence of the Middle Prehistoric Period. Following the retreat of major glaciation in North America, conditions of heat and aridity characterized many parts of the Western United States. In many areas of the Great Plains and the Great Basin, the Middle Prehistoric Period has been equated with that part of Antev's (1948; 1955) "temperature curve" known as the Altithermal. For that time, the Great Plains often has been inferentially equated with the Desert Culture of the Great Basin, with a primary economic emphasis on gathering. The term "Forager", often applied to the lifeway of this period, implies that intensive exploitation of the total environment was practiced as culture permitted.

The Middle Prehistoric Period, described by William Mulloy (1958), may be summed up with the basic pattern of small, nomadic groups of hunters and gatherers, already set up during the Early Prehistoric Period, persisting and with an increasing economic dependence on gathering. With the gradual extinction of many larger Pleistocene game animals, the vegetable gathering orientation became intensified as the Altithermal progressed. This was reflected by a decrease in the number of projectile points and hide working tools and an increase in manos and metates. From sites of this period, animal bones are scarce and the larger forms absent. Large fire pits filled with burned stones were common and are presumed to have been roasting pits for vegetable products.
However, scattered evidence from Signal Butte and several Middle Period sites on the Northwestern Plains suggests that bison hunting was strongly developed at that time. Mulloy (1958) points out that the earliest evidence of bison traps is found in this period. The Powers-Yonkee bison trap (Bentzen 1962) in southeastern Montana dating 4450 + 125 B.P. or about 2500 B.C., and the Oxbow Culture in Southern Saskatchewan, a bison hunting complex with side-notched projectile points, and dated at 2693 + 150 B.C. (Meyer-Oakes and Wettlaufer, et al., 1960), indicates that bison hunting occurred in specific parts of the Great Plains during the Middle Prehistoric Period.

From Yellowstone National Park, surface collections from nineteen sites that contained Middle Period artifacts included very few grinding implements. Artifacts from these sites consisted of Middle Period projectile point types, knives, and scrapers, suggesting that hunting took precedence over gathering there during the Middle Period (Taylor 1964; Hoffman 1961). This is probably due to the fact that arid conditions may never have occurred in Yellowstone Park.

Excavation at the Carrella Site (24PA302) in the Upper Yellowstone Valley revealed a single component that contained projectile points ranging through the McKeen-Duncan-Hanna series to corner-notched points, and several lanceolate specimens that may have preceded McKeen points in time. Included also, were numerous scrapers, knives, choppers, cores, and flake tools. Most interesting were bones from the site. Hundreds of bone fragments and broken bones of large animals were recovered. Among the animal species represented were deer, elk, possibly antelope, and
bison. No evidence of small animals was found. From all indications, the Carbellla Site was a summer hunting camp that may have been a base for this activity in Tom Miner Basin, a high mountain meadow above and west of the site.

In Yankee Jim Canyon, the important Rigler Bluffs Site (24PA401) (Haines, 1966:5), consisted of a stone lined hearth deeply buried in lake silts. Five closely related radiocarbon dates that averaged 3,005 B.C. were obtained from charcoal in the hearth. What may be the base of a Hanna point (Taylor 1964), a scraper, and several bone fragments from large animals were reported in association with the hearth. This scanty evidence suggests hunting to have been the activity associated with the site.

However, notably absent from Yellowstone Park sites were manos and metates (Taylor 1964; Hoffman 1961), and only one metate from 24PA324 was recovered during survey from Upper Yellowstone sites north of the Park.

A single lump of charcoal from the Rigler Bluffs hearth, identified as *Taxus brevifolia* or Pacific Yew wood (Letter from Aubrey Haines to George Arthur dated March 28, 1966), may lead to complication of the problem of Upper Yellowstone environment during the Middle Prehistoric Period. A large sample of charcoal from the site is presently under analysis to determine, if possible, the various species of wood. Pacific Yew, found today in the Pacific Northwest, and the northwest corner of Montana and in northern Idaho, is no longer present in the floral assemblage east of the continental divide in Montana. Since this species grows in a climate much wetter than that presently found in the Upper
Yellowstone, there is the possibility that 5,000 years ago, the climate of this locale was at variance with the presumed climate of the Central Yellowstone Valley in the vicinity of Pictograph Cave, or southward in the Shoshone Basin of Wyoming.

Although gathering has been practiced in Western North America for at least 9,000 years, there is little evidence at present to suggest a primary emphasis on gathering in the Intermountain Region of Montana during the Middle Prehistoric Period.

Present limited evidence gives no indication that a hot, arid Altithermal ever existed in the Upper Yellowstone. There is, however, the strong possibility that climatic fluctuations occurred in the Rocky Mountains during the Altithermal as occurred during the Medithermal in the Lemhi Mountains (Dort 1962), and at Birch Creek (Swanson, Butler, and Bonnichsen 1964) in the Rockies in Idaho.

Such fluctuations may be reflected in the Shoshone Basin sites in Wyoming (Mulloy 1954), where numerous manos and metates were recovered with a small assemblage of projectile points and hide working tools, indicating an emphasis on gathering and that the climate was very dry. A similar aridity was indicated in Pictograph Cave II.

In the "Montana Western Region" (Malouf 1956), the term "Forager" has not proven applicable. Projectile points (McKean-Duncan-Hanna and corner-notched) elsewhere associated with the Middle Prehistoric Period are found in tool assemblages that consist almost exclusively of projectile points, knives, scrapers, perforators, mauls and pestles. Manos and metates have not been found. According to Malouf (1962a), mauls and
pestles were introduced into the region very late in prehistoric times. What are presumed to have been roasting pits may have been introduced as early as the Late Middle Prehistoric Period. With the exception of a few edge-ground cobbles, possibly of Middle Period origin, there is, as yet, little archaeological evidence that gathering was practiced at all in this region during the Middle Prehistoric Period.

For the area immediately east of the continental divide in the vicinity of Helena, Montana, the literature contains no mention of manos and metates (Forbis 1950; Forbis and Sperry 1952; Malouf 1950; Shumate 1950), and there is no evidence to indicate that during the Middle Period, peoples of this area relied on anything but hunting for subsistence. The archaeological evidence, at least, would suggest that the climate of this area was favorable to large game animals and man during the Middle Prehistoric Period.

In the past, interpretations of Middle Prehistoric Period events along the east slope of the Rocky Mountains in Montana and Wyoming have been conditioned by archaeological events farther east on the plains or by events in the Great Basin, in the absence of information from the Inter-mountain Region.

A most tempting theory, accepted by many Plains archaeologists to account for a lack of Middle Period sites in the Great Plains, proposes that as the Great Plains became drier, large game animals, following the lusher lines of vegetation, sought refuge in the Rocky Mountains, and in turn, were followed by man who abandoned the Plains.

Whatever the merits of this theory, it cannot be accepted without modifications. That Middle Period peoples gradually followed the game
animals into the mountains may be true due to the shifting edge of ecological zones, or, some may have remained on the plains with dwindling subsistence resources and a consequent population reduction. However, a general exodus would mean that we should expect to find mostly Early Middle Period artifacts on the Plains with a gradual shifting to Late Middle Period artifacts occurring mostly in the higher mountains. The geographic range of known Middle Period projectile points (McKean-Duncan-Hanna series) includes both the Plains and areas throughout the Rocky Mountains.

The scant traces of Early Man found in the Upper Yellowstone drainage including Yellowstone Park as compared to the large number of small Middle Period sites implies a greater use of the mountains during the Middle Prehistoric Period, but does not necessarily imply a mass exodus from the Plains into the higher mountains and mountain valleys during this time.

An alternative is perceived in a modified concept of seasonal transhumance, the practice of changing abode in a regular and traditionally recognized way by following natural food crops. Although not a new idea, seasonal transhumance received recognition recently from studies by Davis (1963) in the western Great Basin. There, according to Davis (1963), transhumance took people through a great variety of altitudes, from approximately 4,000 feet on the valley floors to 8,000 and 10,000 feet in the Sierras and White Mountains. For the people who followed it, transhumance allowed them to exploit a succession of food crops which matured at different elevations, and it gave them climatic
protection. In winter, the mountains were much too cold, but in summer the valleys were too hot. Davis (1963) demonstrated that seasonal migration in that area of the Great Basin may have persisted throughout the past 6,000 to 7,000 years. Davis (1963:203) reports that according to Paiute informants, transhumance took the following pattern in historic times:

Each spring, when the sun grew warm, Kuzedika family groups broke up their winter camps. They turned their metates upside-down, stuffed grass into their mortar holes to keep out the rats until the next season, took weapons, rabbit skin robes, and burden baskets, and plodded toward the Sierras. They camped along streams in sheltered canyons and gorged on such early greens as wild onions and cress. Deer were available when they migrated from winter ranges at low altitudes to summer ranges high in the Sierras. However, judging from their common occurrence in petroglyphs, sheep were a more common game animal than deer. This sort of pattern continued through the summer.

Interpreted in the isolation of the Park itself, or including the Upper Yellowstone drainage south of Livingston, Montana, the evidence led directly to the conclusion that Middle Prehistoric Period people who occupied this area were simply hunters, and nothing more. The few scattered traces of gathering such as the several metates reported from Yellowstone Park (Taylor 1964), and the Art Mile's Ranch site metate, have been difficult to "fit into" such a strong hunting orientation.

Important for consideration is the fact that Middle Period sites in the mountains and higher valleys at elevations above 6,500 feet are consistently small in areal dimension. Nearly all of the sites in Yellowstone Park were less than an acre in size. The Middle Period sites were invariably small. Only four sites in the Park exceeded several acres in size and these were believed to belong in the Late Prehistoric Period.
If tipi rings found in the Upper Yellowstone drainage are eventually found to have served a domiciliary function, and may also be attributed to the Late Middle Prehistoric Period, then the size of these "camps" in the Park was exceedingly small, becoming larger at lower elevations and toward the Plains. For within the Park, tipi ring sites consisted of individual rings to as many as four rings in one site. However, proceeding from the Park down the Yellowstone drainage, the number increased to as many as thirty rings per site in Paradise Valley south of Livingston, and to forty-six rings at Big Timber, with exceedingly larger numbers at individual sites farther downstream and northward on the Plains of eastern Montana.

Continuing down river to lower elevations and then expanding the geographic area of the Upper Yellowstone to include intermountain valley sites in the vicinity of Bozeman, Montana, a different picture begins to emerge. Nestled along the mouths of unglaciated canyons near Bozeman, Montana, and along the west slope of the Bridger Mountains north of Bozeman, are several large site areas exceeding twenty acres each in size. Most of this land is under cultivation. Extensive evidence of Middle Period occupation is found throughout these sites and grinding implements have been found in all of them.

The extensive King Site (24GA214), where the opportunity for more intensive examination occurred, yielded lithic artifacts ranging from the Early Prehistoric Period well into the Historic Period, and included numerous manos, many metates, many fragments of broken metates, and over a hundred edge-ground cobbles. The fact that the field has been cleared
of stone periodically for the last fifty years probably reduced greatly the number of metates that originally could have been found.

Important at the King site and at other lower elevation sites was that Middle Period projectile points were made from obsidian. Although frequent reports occur of obsidian deposits north of the Park, several of these locations that were examined contained dark flint mistakenly identified as obsidian. The only known deposits of obsidian in Montana occur in Yellowstone Park. Therefore, the numerous McKean, Duncan, Hanna, and corner-notched points found at sites north of the Park were made from obsidian probably obtained in the Park during annual seasonal visits.

From plowed fields at the extensive Shields Site (24PA321) north of Livingston, Montana, surface evidence of Middle Prehistoric Period occupation included projectile points that indicate Early Middle Period occupation, the later Besant points, and several grinding implements. Relative to the surrounding terrain, the site is situated in an excellent camping location around a number of springs. The site is stratified and contains similar Middle Period evidence, including manos and metates, that have been found in the large sites near Bozeman, Montana.

By enlarging the geographic area beyond the limits of the defined thesis area, it becomes apparent at lower elevation sites that gathering assumed more importance as an economic activity than at higher elevation sites, although hunting remained dominant throughout the area of our concern. A geographic enlargement allows seasonal transhumance to emerge as an alternative for understanding certain Middle Period events in this
region. Middle Period sites in Yellowstone Park, for example, may represent the seasonal hunting activity of a specific group of people, but merely as part of their larger annual subsistence pattern that included gathering as another related activity at lower elevation sites that may have extended well onto the plains.

Since most of our evidence so far has been recovered off the surface, perhaps our concern is as Davis (1963:204) indicated:

A source of confusion to archaeologists is the fact that different types of sites have different artifact assemblages. Summer campsites in the meadows have colonies of mortars and are littered with fragments of metates and manos. In contrast, travelers' campsites on the summits of ridges often show no grinding implements at all.

By expanding the geographic area of the Upper Yellowstone to include a larger portion of the high plains fringe along the east slope of the North-Central Rockies, other important sites are encompassed including Pictograph Cave, Mulloy's Shoshone Basin sites and Birdshead Cave. Application of the seasonal transhumance concept to these sites might add a new dimension of understanding to prehistoric events along the east side of the Rocky Mountains in Wyoming. However, seasonal transhumance as a hypothesis remains to be tested throughout the region by controlled site excavations and inter-discipline study.

Late Prehistoric Period (ca. A.D. 500 to A.D. 1800)

For many parts of the Northwestern Plains the Medithermal, as part of Antev's (1948; 1955) temperature curve, is believed to have begun about 1,000 B.C., considerably earlier than the beginning of Mulloy's (1958) Late Prehistoric Period. The Medithermal is characterized by a cooler and moister climate than the preceding Altithermal, but when it began in
the Upper Yellowstone is not known. Apparently, the preceding Altithermal was not severe in the Upper Yellowstone country and the hunting of large game animals persisted throughout the Altithermal and into the Medithermal. However, as the Medithermal progressed, the present day species of North American bison began to increase and bison traps and surrounds came into use.

In the Northwestern Plains and in the intermountain Rockies of southern Montana, perhaps the most significant advance of the Late Prehistoric Period was the buffalo jump. Although evidence may place their beginning earlier in time, it was during the Late Prehistoric Period that buffalo jumps reached their peak of development and use. As the economic base of this period, bison provided a stable food supply that required the buffalo jump for its exploitation.

Social consequences of the buffalo jump appear in an increasingly larger population as indicated by larger campsites than during the Middle Prehistoric Period, and in the consequent complexities of social organization as indicated by communal effort to operate bison drives utilizing buffalo jumps.

The further importance of bison is noted in the bison skin covered pole lodge or tipi as one kind of dwelling used by all of the buffalo hunting plains tribes, and by many tribes west of the continental divide very late in prehistoric and during historic times.

The kind of dwelling that preceded the tipi in this region is unknown. However, several other kinds of dwellings that supplemented the tipi were conical wickiups, truncated conical brush structures incorporating vertical sandstone slabs around the periphery (Mulloy 1965a), and
cribbed log structures (Mulloy 1965a). Other kinds of structures may be indicated by tipi rings or stone circles that date as early as 8600 B.P. (Mulloy 1965b) and probably came into wide use in the Late Middle Prehistoric Period (Mulloy 1954). However, stone circles were used by the Blackfeet in historic times to hold down the skin covers of pole lodges (Kehoe 1960). Although certain evidence suggests unknown functions for many stone circles, most likely, many plains tribes utilized stones for holding down lodge covers.

Early in the Late Prehistoric Period, the transition from atlatl and spear to bow and arrow is suggested by the large Besant points, dated at A.D. 377 + 325 (Wettlaufer, Meyer-Oakes, et al., 1960) associated with bison kills (Arthur 1962; Davis and Stallcup 1965), stratigraphically followed by the small distinctive Avonlea points dated at A.D. 460 (Kehoe and McCorquodale 1961) which are very similar in size and shape to the very late side-notched points used on arrows.

Although of indeterminate origin, the earliest pottery found so far on the Northwestern Plains is associated with Besant culture (Wettlaufer, Meyer-Oakes et al. 1960). However, no pottery was found at either site in the Upper Yellowstone where Besant points were recovered. So far, pottery found in Southwestern Montana consists of the much later Intermountain Tradition Pottery (Mulloy 1958) that appears to have its closest affinities with the flat-bottomed Shoshoni pottery from Idaho and Utah. Associated with this flat-bottomed pottery are the steatite vessels that have been found within the same general geographic area as Intermountain Tradition pottery and are presumed to be of Shoshoni origin.
Although the prehistoric relationships are difficult to ascertain, the Rocky Mountains apparently did not comprise a barrier to culture, and movements of various historic tribes east and west of the divide were common during the Late Prehistoric Period.

In the Upper Yellowstone, percentages of tools made from obsidian increased as the Late Prehistoric Period progressed. This increase was noted by comparing artifacts from a bison kill (24PA308) of possible Late Middle Prehistoric Period beginnings with artifacts from the later buffalo jump (24PA209). The use of local materials generally prevailed and the amounts of obsidian used decrease to become nearly non-existent in northern and eastern Montana artifact collections. In the Montana Western Region, obsidian is prevalent in many sites, although use of local cherts and chalcedonies appears to have predominated there.

North of the Park in central Montana, pictograph and petroglyph sites occur in large numbers. They are especially numerous along the Musselshell River and into southeastern Montana and the Wyoming Basin. West of the continental divide petroglyphs are entirely absent. Pictographs are the solid red colored figures, usually of animals, and none of the classic "shield bearing warrior" designs (Conner 1962) have been observed there. According to Wormington (1955), the nearly identical counterparts of the "shield bearing warrior" designs found in Utah and Colorado are those found in Pictograph Cave (Mulloy 1958) in Montana. If indeed they are related, the relationship is most likely by way of the east slope of the Rocky Mountains. Shield bearing warrior designs are seldom seen in pictograph sites in southwestern Montana or Idaho and none have been reported from Washington or Oregon.
In summation, research in the Upper Yellowstone reveals human habitation dating back at least 10,000 years. Although we know little of the Early Period big game hunters who occupied this area, we know that they visited the high mountain ridges as well as the lower unglaciated valleys. The scanty traces of their former occupancy indicates small, nomadic groups of hunters.

With the gradual shift to warmer temperatures during the Middle Prehistoric Period, human habitation of the Upper Yellowstone increased. This increase was probably due partly to migration from dissicated areas of the Plains as well as to increased seasonal dependence on the mountains for food by groups living along the mountain flanks. Hunting maintained dominance in the area as a source of food although traces of gathering are present, possibly as influences from the Great Basin.

With the return of cooler temperatures and increased moisture of the Late Prehistoric Period, the gradually increasing number of bison provided sufficient food and shelter for a larger human population on the Great Plains. Seasonal migrations to the mountains continued, and gathering provided a variety of additional foods to supplement the meat from bison and other large game animals. The advent of the buffalo jump and the bow and arrow, combined with the great increase in bison added bounty to the lives of Indians on the Plains that could only surge to greater richness with the later advent of the horse and the rifle.


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APPENDIX
### APPENDIX A

#### SOIL PROFILE AT EAGLE CREEK SITE

<table>
<thead>
<tr>
<th>Horizon</th>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>0-2</td>
<td>Dark gray (10 YR 4/1 dry) black (10 YR 2/1 moist) loam; weak fine granular; loose, friable, non-sticky and non-plastic; many fine roots; pH 7.8.</td>
</tr>
<tr>
<td>B2</td>
<td>2-9</td>
<td>Dark gray (10 YR 4/1 dry) black (10 YR 2/1 moist) heavy loam; moderate coarse prismatic; hard, firm, slightly sticky and plastic; few fine roots; pH 7.8, non-calcareous; clear wavy boundary.</td>
</tr>
<tr>
<td>B3</td>
<td>9-19</td>
<td>Dark gray (10 YR 4.5/2 dry) very dark gray (10 YR 3/1 moist) loam, weak coarse subangular blocky; hard, friable slightly sticky and slightly plastic; few roots; pH 8.0, non-calcareous; clear wavy boundary.</td>
</tr>
<tr>
<td>C1</td>
<td>19-36</td>
<td>Dark grayish brown (10 YR 4/2 dry) very dark grayish brown (10 YR 3/2 moist) loam-very fine sandy loam; weak medium subangular blocky; hard, friable non-sticky and slightly plastic; few fine roots; many pores, pH 8.2 non-calcareous; gradual boundary.</td>
</tr>
<tr>
<td>C2</td>
<td>36-48</td>
<td>Grayish brown (2.5 Y 5/2 dry) very dark grayish brown (2.5 Y 3/2 moist) fine sandy loam with few gravels; massive; hard; firm, non-sticky and non-plastic; many fine pores; pH 8.0 non-calcareous.</td>
</tr>
<tr>
<td>IIC3</td>
<td>48+</td>
<td>Large boulders with material similar to above between the boulders.</td>
</tr>
</tbody>
</table>

The Eagle Creek Site is located on an alluvial fan that has been partially dissected. The stream has evidently deposited material to a depth of forty-eight inches over the boulders which are probably of glacial origin and is now coursing along the north side of the fan.

The material designated as C1 and C2 was probably deposited at times when the stream was in position to flow over the fan or was part of the stream bed, possibly a meander.
The material between two inches and nineteen inches which over­
lies the hearth could have been deposited in one large increment and
perhaps induced the abandonment of the site.

The lower-lying wet soils immediately surrounding the present
site were probably abandoned prior to the present site because these
lower-lying positions became unsatisfactory due to seasonal flooding and
perennial wetness - seepage from higher lands and capillarity from the
stream.

The surface two inches were probably added by stream flooding in
the recent past. It appears to be a recent deposition, possibly due to
blockage of the stream by fallen trees forcing the water in early spring
to run over the present site. The soil here is not calcareous, i.e. it
does not effervesce when dilute 10 per cent HCl is applied. The morph­
ology of the soil, especially the thick dark two to nineteen inch upper
portion, suggests a microclimate much different from that of the immediate
adjacent and surrounding soils. Observations in early spring revealed
that the upper fifteen inches of the soil was dry and below fifteen
inches the soil was moist, probably due to capillarity. A white C accumu­
lation (probably salt) had accumulated on the surface of the excavation.