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A PRELIMINARY ARCHAEOLOGICAL SURVEY
OF YELLOWSTONE NATIONAL PARK

by

J. Jacob Hoffman

B.A. Montana State University, 1953

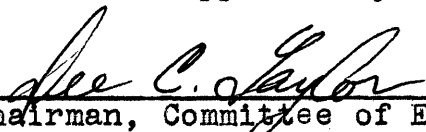
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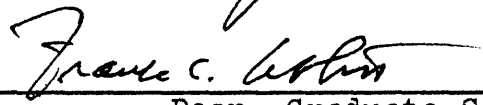
Master of Arts

MONTANA STATE UNIVERSITY

1961

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Mr. Jack Boucher, National Park Service photographer, deserves credit for many of the better photographs included in this manuscript -- I assume full responsibility for the remainder.

My appreciation goes to Dr. C. I. Malouf and Dr. D. C. Taylor of Montana State University, directors of the Yellowstone survey, for permitting me to do the field work and archaeological interpretation necessary for the preparation of this manuscript. I also wish to

thank Drs. Malouf and Taylor as well as Dr. Chester Beaty of Montana State University for their aid and criticism rendered during the preparation of this manuscript.

My field partners for the survey, George Arthur for the 1958 season and Paul Lerner for the 1959 season, deserve credit for their efforts. A special thanks goes to William G. Buckles, also a field partner for the 1959 season, who gave me several pertinent insights into the problems of Yellowstone Park archaeology.

Montana State University
Missoula, Montana
August 1961

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INTRODUCTION

Yellowstone National Park today is one of the major tourist meccas of North America. More than a million people pass through the Park every year (Haynes 1958). For many of the visitors, the purpose of their visit is sheer pleasure: to view the natural wonders of Yellowstone Park. Geysers and other thermal features, wildlife, geological curiosities and mountain scenery all provide an attraction for the North American tourists.

The formal operation of this public playground began on March 1, 1872, when an act of Congress established Yellowstone National Park. Two years previously, an expedition headed by Nathaniel Langford had entered the Yellowstone Plateau from southwestern Montana Territory. The express purpose of this expedition was to explore the Yellowstone area. Rumors concerning the area's geological curiosities had circulated through the western United States for many years. These rumors ranged from "Coulter's Hell" and Jim Bridger's "Mountain of Glass" (Obsidian Cliff) to vague references concerning a lake sitting astride the Continental Divide.

Until 1870, these rumors were not taken very seriously because Indians in the neighboring regions professed ignorance of Coulter's Hell or any Mountain of Glass. There seemed to be no reliable knowledge con-

cerning the high plateau between the headwaters of the Snake river and those of the Yellowstone river. The area between was thought to be a maze of unexplored mountains; a northern extension of the Teton range. Moreover, there was no outstanding reason to penetrate the area before 1870. No great bison herds roamed in and out of the area, the collapse of the beaver pelt market had ended commercial exploration, and gold had not yet been found on the edges of the plateau. It was difficult to approach the unknown area from the south and east due to the rugged Absaroka and Teton ranges. Not until areas north and west of the plateau had been settled was there sufficient interest in entering the unknown region. White man entered the Yellowstone Plateau because of the rumors he had heard; he remained to establish Yellowstone National Park as a public recreation area.

The "early" explorers assumed that they were the first men into the area. After all, Indians in the regions surrounding the Park seemed unacquainted with the area south of the Gardiner river drainage and northeast of Henrys lake (Haines 1955, Howard and McGrath 1952). Even those Indians who accompanied the first exploring parties expressed surprise when they first saw the thermal features and other geological curiosities within the Park. How much of the Indian's surprise was real, we don't know today. However, we do know that

white men soon discovered that they were not the first humans to have occupied the thermal regions of the Park. Indian artifacts, mostly projectile points, were found scattered in many areas of the Park. Before the establishment of the National Park Service in 1916, park concessionaires carried on a brisk business in the collection and sale of projectile points. Obviously, prior occupation of the Park was not a matter of fact but degree. Still, local Indians appeared ignorant of the region. But one small band of Tukuarika knew the area. These were the "Sheepeaters", a Shoshonean band that occupied an undelineated area of the Yellowstone Plateau (Chittenden 1905). Unfortunately, we know little of these peoples activities inside the Park. Soon after their "discovery" the Tukuarika were removed by army authorities to Fort Hall, Idaho, and absorbed by Bannocks and other Shoshonean peoples.

One band of Indians that did prove its ignorance of Yellowstone Park geography was Joseph's retreating band of Nez Perce. Joseph's swing through Yellowstone while he was avoiding Governemnt troops during the "Nez Perce War" of 1877 had two amusing sidelights. The first was that of the Nez Perce becoming lost on the Yellowstone Plateau. Apparently Joseph had intended to strike for the upper Yellowstone river over the traditional

Nez Perce route to the bison-hunting grounds of the Crow. This route led east over the Gallatin mountains, down the Gardiner river to near its confluence with the Yellowstone river and north through the Big Boulder area in south-central Montana Territory to the upper Yellowstone river. Somehow, Joseph went off course and entered the Yellowstone Plateau through the Madison river drainage rather than over the Gallatin mountains (Kearns 1935a). Joseph found himself on the Firehole river; he was lost, surrounded by geysers and other thermal phenomena. Not at all awed by the thermal features, the Nez Perce apparently used them for cooking purposes (Kearns 1935b). The befuddled Nez Perce band soon secured a guide to lead it out of the Park -- a captured tourist!

The second amusing result of the Nez Perce invasion took the form of Philetus W. Norris's attempts to discount the whole affair. The younger, more eager warriors of Joseph's band shot up several tourist parties and generally terrorized Park visitors. "Colonel" Norris, the second Superintendent of Yellowstone National Park, realized the bad publicity the Park had suffered from Joseph's visit. The Colonel toured Indian reservations near the Park and secured promises from the Indians that they would not enter the Park. These promises were widely advertised in the eastern United States in an effort to convince potential tourists that Yellowstone was quite

safe from future Indian attacks. Norris presented the idea Indians rarely came into the Park and, as a matter of fact, this was the first time it had ever happened! Somehow, Norris's promotional scheme was coupled with the idea that Indians feared geysers (Beal 1949). The scheme soon snow-balled to a point where semi-official information dispensed to Ranger trainees solemnly advised that, "Indians never lived in Yellowstone Park because they were afraid of geysers." (personal interview with Assistant Chief Ranger Lee Coleman, July, 1958). However, few Rangers or Naturalists ever took this advice seriously. This is well borne out by the sizable collection of Indian artifacts on deposit at the Yellowstone Library and Museum Association at Mammoth Hot Springs. The Museum collection was started before 1920 when "Indian fear of geysers" was still the semi-official view.

Two significant points emerge from the preceding discussion. 1.) Historic Indians seemed to be unacquainted with the Yellowstone Plateau south of the Gardiner river system. 2.) The popular notion that Indians feared geysers and, thus, never lived in Yellowstone Park was derived from the artifice of a Park Superintendent functioning as a resort promoter.

Some of the problems presented to an archaeological investigation of Yellowstone Park came out of the known history of the Park. Historic and Prehistoric occu-

pation of the Park could not be questioned as a matter of fact but rather as a matter of degree; that is, the problems of investigation centered on determining the degree of occupation. What portions of the Park had been occupied? When were the portions occupied and how long was the occupation? Could the occupants be identified with Historic peoples? Where did they come from and where did they go? Stated simply, the problem was: by limited archaeological survey, determine as much as possible about the human prehistory of Yellowstone National Park.

The Yellowstone Library and Museum Association at Mammoth Hot Springs has an artifact collection which numbers in the thousands of pieces. Legitimate collecting for the Museum has been in process for some forty years. Authorized National Park Service personnel have recovered artifacts from many parts of the Park. Many descriptive notes on the archaeology of the Park have been published in Yellowstone Nature Notes, the official newsletter of the Yellowstone Library and Museum Association. The Museum also published popular handbooks pertinent to the Park. One of these handbooks, Yellowstone's Bannock Indian Trails (Replogle 1956), represents a first attempt at archaeological interpretation of Park artifacts. One article from Yellowstone Nature Notes is quite worthwhile mentioning. "American Indian Burial Giving Evidence of Antiquity Discovered in Yellowstone National

Park" (Condon 1948) is notable as an early attempt at interpretation of the physical remains of one of the Park's former occupants.

Illegal collecting and looting (as defined by the Federal Antiquities Act of 1911) has proceeded alongside legitimate collecting in the Park. Illegal activity has probably recovered more artifacts than the activities of authorized personnel. Illegal activities have been difficult to prevent since Government employees are often involved.

The above described activities represent the sum of previous work done on Yellowstone's archaeology. From these activities we can see that; 1.) the Park's artifacts have been, and are still being, rapidly and illegally carried away and, 2.) previous work has been unsystematic and, for the greater part, mostly descriptive.

Thus, the need for a coordinated, interpretive survey of Park archaeology was appropriate. The motive for survey rested squarely upon the commitment of the National Park Service to preserve natural phenomena within Yellowstone Park. In addition, the Park Service was committed to satisfying public curiosities regarding the human prehistory of the Park. The construction projects of the Mission 66 Program for improving Park facilities threatened the destruction of much prehistoric evidence. Previously, Park Service archaeologists had directed the

incorporation of funds for archaeological salvage and survey within the Mission 66 Program.

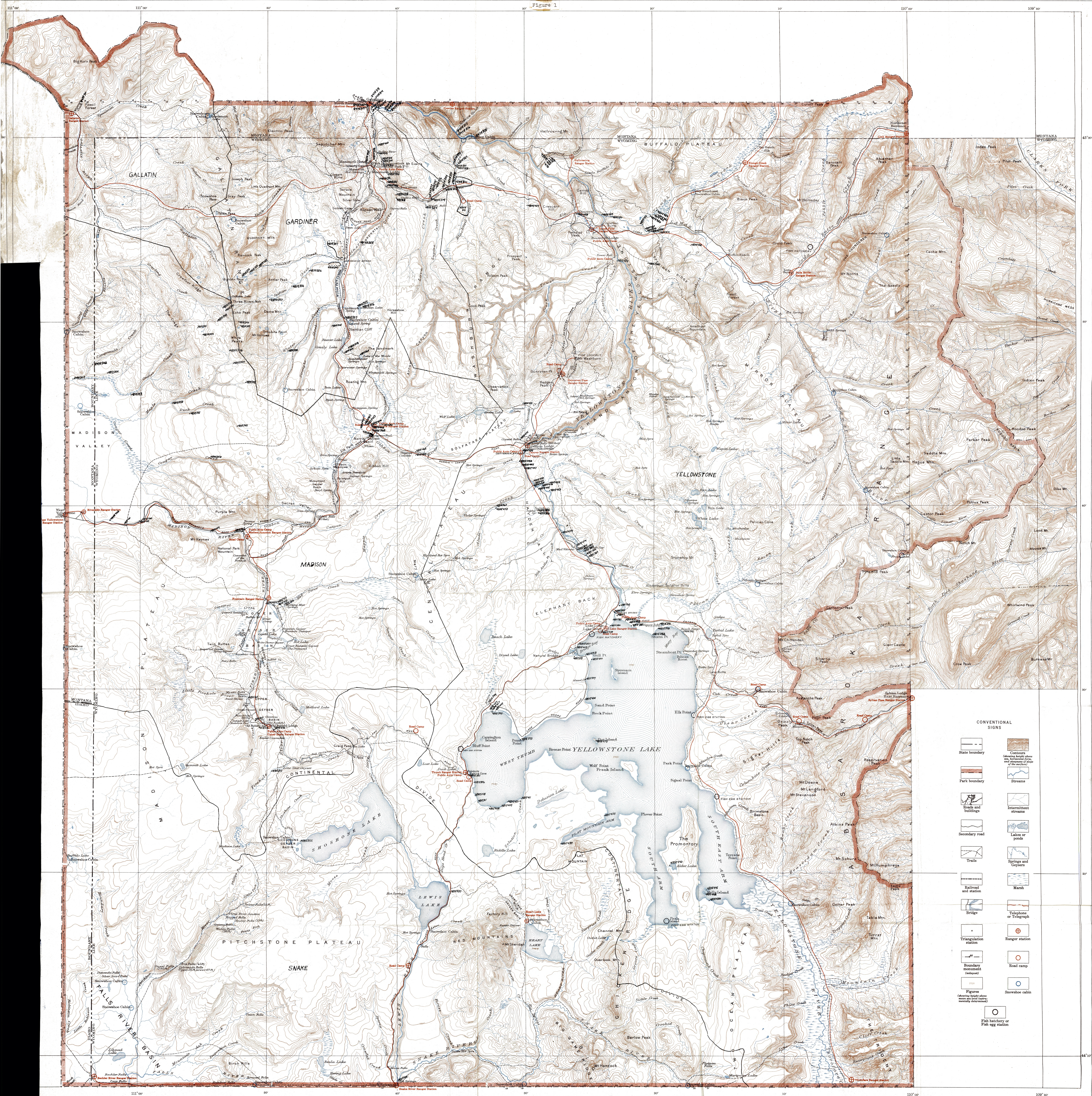
Mr. Paul Beaubien, by tapping the funds allotted for the purpose, contracted with Montana State University to bring the survey to reality. The men, equipment and past experience of such projects qualified the Anthropology department of Montana State University to carry out the Yellowstone survey. The survey was considered as a "crash program"; that is, as much information as possible was recovered from the widest possible area within a limited time. The survey was extensive rather than intensive.

The artifact collection of the Mammoth Museum and previous legitimate work were considered (but not made the basis of) within the Yellowstone survey. In its primary stages, the survey crew took the attitude that it was doing the first systematic investigation of Park archaeology. Later, actual previous work was considered, evaluated and the pertinent data incorporated within the survey. Within its limited time, the survey crew investigated as many as possible areas of suspected aboriginal occupation. Standard techniques and site forms were used for locating, recording and analyzing recovered sites and artifacts.

On July 1, 1958, a two-man survey crew from Montana State University began its work under contract

with the U.S. National Park Service. The survey was directed by Dr. C. I. Malouf and Dr. D. C. Taylor, both of Montana State University. Actual field work and analysis was done by J. Jacob Hoffman. The short, summer seasons of 1958 and 1959 were allotted to the survey crew for the purpose of investigating the archaeology of Yellowstone National Park. Additional reconnaissance among the islands of Yellowstone lake was carried out in early October of 1959. Investigation of the islands could not be made before October for fear of disturbing the nests and fledglings of migratory birds.

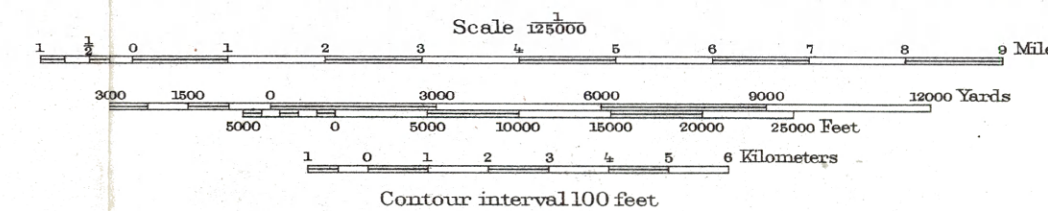
We have already mentioned the need and motive for an archaeological survey of Yellowstone Park. The purpose of this manuscript is to present the results of the survey. We propose to present the pertinent data recovered from the Park and make a tentative interpretation of said data. By means of cultural interpretation, we submit a historical reconstruction of Yellowstone's past cultures. Our purpose is to place the Park reconstruction in context with the prehistory of the Northwestern Plains of the United States by means of cultural relationships. We offer this manuscript as a historical reconstruction of the cultures of a previously uninterpreted area.



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TOPOGRAPHIC MAP OF THE YELLOWSTONE NATIONAL PARK WYOMING-MONTANA-IDAHO



FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 2, COLORADO OR WASHINGTON 25, D. C.
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Trails, road names, and red overprint revised
1930 by National Park Service

INTERIOR GEOLOGICAL SURVEY, WASHINGTON, D. C. 20508

Polyconic projection

reprinted 1957

GENERAL DESCRIPTION OF YELLOWSTONE PARK

Yellowstone National Park is mainly a high, plateau extension of the Northwestern Plains. Its present political boundaries quite closely parallel the edges of the Yellowstone Plateau. The eastern boundry of the Park is marked by the Absaroka mountain range. The Plateau escarpment is well defined on its southern and southwestern edges. The southern escarpment is broken at three points by the headwaters of the Yellowstone, Snake and Bechler rivers (Figure 1). These points of penetration are marked by river falls, swamps and heavy timber. With the exception of one modern highway, the points of penetration are almost impassable.

The northwestern corner of the Park is marked by the Gallatin mountain range while a spur of the Absaroka range bounds the northeastern corner. The two main means of entrance to the Yellowstone Plateau, even today, are the Madison river on the western boundry and the Yellowstone river on the northern boundry. At these two points the heavy timber cover within the Park thins out to become sage brush and bunch grass -- the familiar ground cover of the Northwestern Plains. The main physical features of the Yellowstone Plateau are six internal plateaus marked by sizable drainage areas and attached and detached spurs of the surrounding mountain

ranges.

The entire Plateau is quite high in elevation. Altitude ranges from less than 5400 feet above sea level in the area where the Yellowstone river leaves the Park to 11,740 feet above sea level at Pilot Peak in the Absaroka range just beyond the northeastern corner of the Park. Yellowstone lake, the central feature of the Plateau, has a mean annual level of 7731 feet above sea level. The Continental Divide is an almost insignificant feature in these high altitudes. It is not marked by any particular crests and appears almost level in some areas of the Park. Almost two-thirds of the Park area is drained by streams which flow northward to empty into the Yellowstone and Missouri rivers. The balance of the Park is drained by the Snake river and its Park tributaries.

Present day fauna of the Yellowstone Plateau includes bison, beaver, black and grizzly bear, elk, whitetail and Dakota mule deer, pronghorn, mountain sheep, moose, otter, muskrat, fox, coyote, mountain lion, bobcat, Canadian lynx, porcupine, eastern woodchuck, red squirrel, chipmunk and various other small rodents. The bird population includes pelicans, trumpeter swan, Canadian goose, blue heron, grebe, ducks of several species, ruffed grouse and ptarmigan. The native cutthroat trout is found in Yellowstone lake and is assumed to be indigenous (Chittenden 1905). Curiously,

retilles other than garter snakes have not been reported in Yellowstone Park. However, I have seen an unidentified type of lizard in some thermal areas and one rattlesnake above 5500 feet altitude.

Common Yellowstone flora includes sage brush, greasewood, red raspberry, gooseberry, currant, service berry, squaw berry, camas, Indian turnip, bitterroot, wild onion, bear berry and mosses. The major trees are lodgepole pine, white pine, Douglas fir, Englemann spruce, silver fir, Rocky Mountain juniper, cottonwood and quaking aspen. Except for the trees, many of the plants and animals of Yellowstone Park are the type usually found on the open plains of the Northwestern United States.

Studies of Yellowstone's Pleistocene history have been few and no studies of its prehistoric post-Pleistocene climate have been made. The Pleistocene history of the Park seems to have ended 8,000 to 10,000 years ago when the Yellowstone ice sheet retreated southward up the Tertiary valley of the Yellowstone river (Alden 1928, Howard 1938). The shallow ice sheet was the last glacial movement of the Wisconsin period for the area. However, the ice had not completely melted away by 8,000 to 10,000 years ago (Alden 1928). In absence of studies dealing with immediate post-Pleistocene times, the following remarks on Yellowstone's past climate are mainly conjectural.

The Anathermal (moist, immediate post-Pleistocene) period of the Park was quite short. In consideration of the Altithermal (arid, post-Pleistocene) period as delineated for the western United States (Antevs 1948) and the topography of the Park, the Yellowstone Plateau was probably quite swampy during Anathermal times. The center of the swamp was probably Yellowstone lake which was about fifty feet higher than it is at present. The Altithermal period of Yellowstone Park probably parallels that of the surrounding plains area. The dates for this period are approximately 7,000 to 4,000 years ago (Antevs 1948). Unpublished studies by Park Naturalists indicate that within recent times lodgepole pine is rapidly crowding out the previous ground cover of sage brush and small shrubs in the lower elevations of the Plateau (information taken from various signs along "self-guiding nature trails" in the Park). If these studies are valid, perhaps much of the present heavy timber cover of Yellowstone Park was lacking in drier, Altithermal times. A lack of heavy timber cover would afford an ease of access and traverse on the Plateau that would not be possible in later, more moist times. To amplify the point, the potential for human occupation of the area would be greater in Altithermal times than in later, more moist times due to the area's suitability for grazing animals. In addition, the altitude and geographic position of the Yellowstone

Plateau suggests that it possessed more moisture than did adjacent areas during Altithe^rmal times. This in turn suggests a greater desirability for human occupation of the Plateau than for adjacent areas under Altithe^rmal conditions. These suggestions are further elaborated in the section on Observations and Conclusions.

At present, the climate in Yellowstone Park is quite cool and moist. Extreme temperatures recorded at Park Headquarters at Mammoth, one of the lowest elevations in the Park, are 96 degrees above zero in July, 1901, and 39.6 degrees below zero in February, 1933. Recorded snow depths range from 35 inches at Tower Falls in 1943 to 89 inches at Bechler Ranger Station in 1936. These figures are spot measurements and do not represent the total annual snow fall for these years. The average annual snow fall at Park Headquarters is 91 inches. This is probably a minimum figure for Yellowstone National Park (Haynes 1958).

Under modern climatic conditions, it is quite difficult to live in the Park during winter months. Winter-time occupation is restricted to a few small areas at low altitudes. Snow can fall any day of the year and summer rainstorms are frequent. Grazing animals, when not fed by man, seek lower altitudes in winter and often leave the Yellowstone Plateau.

THE SITES WITHIN YELLOWSTONE PARK

The Yellowstone survey crew located and recorded 195 archaeological sites within Yellowstone National Park. Seventy-eight of these sites had been previously located by Wayne F. Replogle and are recorded on his map in Yellowstone's Bannock Indian Trails. In addition, fifty-three of our recorded sites had been previously sampled by Park Naturalists and the collections placed in the Mammoth Museum at Mammoth Hot Springs. Two of our recorded sites, 48YE1 and 48YE2, were previously recorded by visiting River Basin Surveyors in the summer of 1948.

Our survey was not an attempt to verify previously reported sites, although we did examine known occupation areas as we encountered them in the field. We did not investigate all the sites reported by Replogle due to our limited time in the field. But on the basis of Replogle's map, and in good faith, we have taken account of these sites in our field analysis.

All recorded sites are designated by the Smithsonian Trinomial system; that is, a number for the state, letters for the county and a number for the site. Thus, 24PA4 would designate the fourth site (4) recorded in Park County (PA), Montana (24). Since counties do not exist in Yellowstone Park, the designation "YE" is used

for Yellowstone sites. Paradoxically, state boundaries are taken into account in the Yellowstone site designations. The numbers 24 (Montana), 48 (Wyoming) and 10 (Idaho) distinguish state areas within the Park (YE). The River Basin Surveys branch of the Smithsonian Institution issued a block of site numbers to the Yellowstone survey beginning with the number 301. Therefore, sites in the Montana area of the Park are numbered 24YE301 to 24YE320. Sites in the Wyoming portion of the Park are numbered 48YE301 to 48YE475. The field reports for sites 48YE1 and 48YE2 were elaborated upon and incorporated within the Yellowstone survey. We neither located nor recorded any sites for the Idaho portion of Yellowstone Park.

Yellowstone National Park was not legally surveyed; that is, divided into townships, ranges and sections at the time of our investigations. Therefore, exact legal descriptions of Park sites are unavailable at present. We recorded site locations by means of topographic and physical features. This system is quite wordy but, under the circumstances, quite necessary. At the time of our field investigations, the latest published map of Yellowstone Park was a U.S.G.S. map of 1883-1885. The U.S.G.S. began electronic mapping of the Park in 1958 but the finished product was unavailable to us in our time of need. The map of 1883-1885 is of small scale

($\frac{1}{2}$ inch to 1 mile) and unwieldy for the purpose of site location. Nevertheless, all sites are located as precisely as possible on this map (Figure 1). In addition, the National Park Service has a policy of naming as few physical features as possible within the Park. These latter two factors made site location rather frustrating. In addition to describing site location, the survey crew recorded site position in relation to surrounding features. This helped to compensate for the lack of legal descriptions for the sites.

All archaeological sites recorded in Yellowstone Park have been recorded as occupation areas. Admittedly, this term is rather ambiguous since sites would not have been recorded had they not shown evidence of occupation. The purpose of the survey, however, was to recover as much varied information about aboriginal occupation as possible in a limited time. Except for one instance, we did not take the time to test the sites for hearths, shelter forms or other campsite evidence. Some occupation areas possessed obvious surface features that enabled us to give the sites secondary descriptions. These secondary descriptions are tipi ring sites, game drives and compounds, quarrying sites, wickiup sites and chip strewn areas. In general, the archaeological materials in Yellowstone Park, as indicated by surface evidence, are quite scanty. Many sites are nothing more than chip

strewn areas.

In addition to recorded sites, the survey crew recorded a few random finds. These random finds consisted of a single tool or a small scattering of chips that, in our opinion, did not warrant a site report..

The majority of recorded Park sites are located along water courses. The sites are generally positioned on the first terrace above the present water level. The close association between sites and water courses is not surprising. The greater part of the Yellowstone Plateau is cut by perennial water courses. Indeed, it is almost impossible to get away from water in the Park. Artifacts are especially noticable at or near the confluences of major streams and points where streams enter or leave lakes. This phenomena suggests that water courses were used as lines of travel in the Park during Prehistoric times even as they are today.

For purpose of field analysis, we divided the Yellowstone Plateau into five major drainage areas (Figure 1) conceptualized as:

1. Madison river drainage, including the Firehole and Gibbon rivers as well as Nez Perce creek..
2. Yellowstone river drainage, including Thorofare creek, Yellowstone lake and its tributaries, and the entire Lamar river drainage..
3. Gardiner river drainage, including Lava creek and its tributaries.

4. Snake river drainage, including Shoshone, Lewis and Heart lakes, and the Bechler river.

5. Gallatin river drainage.

We have classified and totaled the sites in the major drainage areas as:

1. Madison drainage - 41 chip strewn areas for a total of 41 sites.

2. Yellowstone drainage - 97 chip strewn areas, 2 tipi ring sites, 1 game compound, 2 quarrying sites and 1 pottery-yielding site for a total of 103 sites..

3. Gardiner drainage - 40 chip strewn areas, 5 tipi ring sites, 1 wickiup site and 2 quarrying sites for a total of 48 sites..

4. Snake drainage - 2 chip strewn areas for a total of 2 sites.

5. Gallatin drainage - 1 wickiup site for a total of 1 site.

The location of these sites is plotted on Figure 1. The significance of this site distribution is discussed in the section on Observations and Conclusions.

Artifacts recovered by the survey crew are, in the main, stone tools and chippings cast off from the manufacture of stone tools. The tools include projectile points, knives, scrapers, choppers, drills, graters and various types of hand stones. We found very little cut bone associated with the artifacts. The sites where such bone was found are mainly in the northern part of the Park along the Lamar, Gardiner and Yellowstone rivers. The relative absence of bone in the southern

and central areas of the Park may be due, in part, to the greater moisture content of these areas in contrast to that of the northern area. We found no decorated bone in the Park although we recovered stone gravers, tools used to incise bone, from sites along the Yellowstone river in the area where it leaves the northern Park boundary. The more "photogenic" specimens of knives, scrapers, drills and gravers are illustrated on Figures 17 to 23 of this manuscript. Included with the drills and gravers are unprepared flakes that show use as perforators. The stone projectile points recovered from the Park are discussed in the section on Typology and Relationships. The other stone tools are discussed in the section on Miscellaneous Tools.

Despite the fact that steatite deposits are known to exist in areas northwest of the Park, along the Madison river and in the Three Forks region, we found no steatite artifacts or steatite in the Park. As steatite bowl forms have been reported for areas close to the Park (Wedel 1954, Thompson and Hand 1950), I find the lack of steatite in the Park to be unusual. Stone bowls of any type are yet to be reported for Yellowstone Park.

Our survey disclosed only one pottery-yielding site within Yellowstone Park -- 48YE449 -- the First Blood site. This site, located on the northern shores of Yellowstone lake, is the only site in the Park that

we tested. 48YE449 is further discussed in this section as an individual site.

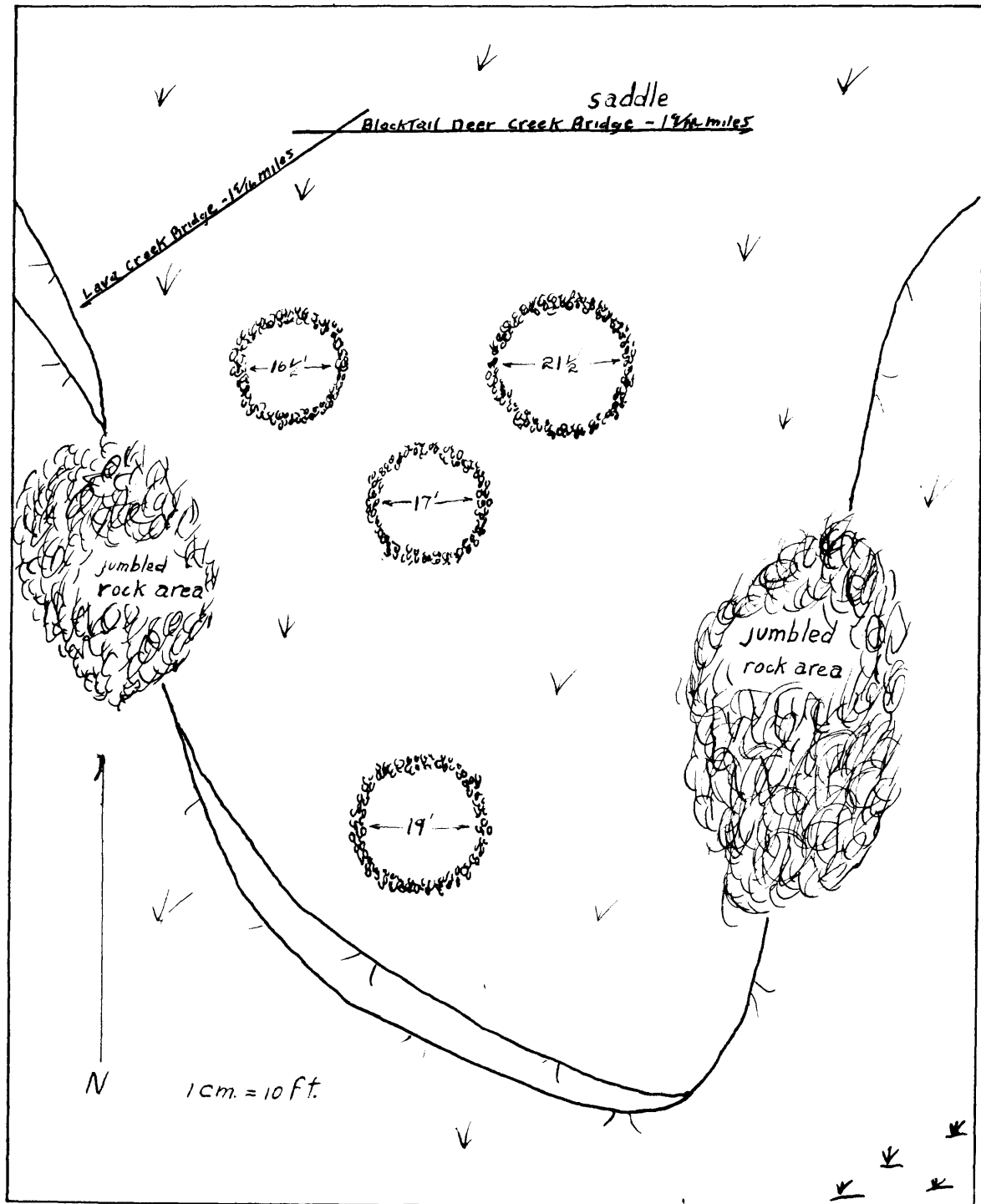
Rock alignment sites appear to be confined to the northern area of Yellowstone Park. We recorded tipi ring and game compound sites along the Lamar river and Lava creek drainages. These sites as well as an intact wickiup site are further discussed in this section as individual sites.

In summary, we recovered only artifacts of stone and pottery within Yellowstone Park. Recorded surface features consisted solely of rock alignments and pole wickiups. All recorded sites are termed as occupation areas. The occupation areas are further designated as tipi ring sites, game compound sites, chip strewn areas, quarrying sites and wickiup sites. To better demonstrate these terms, we will now discuss several outstanding sites of Yellowstone Park

THE P-DON SITE

The P-Don site, 48YE334, is located on the north side of an unnamed drainage 1 9/32 miles west of the Blacktail Deer creek bridge and 1 5/16 miles northeast of the Lava creek bridge in the northern area of the Park (Figure 1). This is a tipi ring site positioned on a small knoll and saddle at the southeastern base

Figure 2



48YE334 THE P-DON SITE

of Mount Everts. Four discernable rings can be seen on the site (Figure 2). The rings are quite large, ranging from $16\frac{1}{2}$ feet in diameter to $21\frac{1}{2}$ feet in diameter, and are confined to an area of 40 feet by 50 feet. The individual rocks of the rings are barely exposed in the glacial till of the site. Jumbled rock areas lie on the immediate east and west sides of the ring area. These rock areas may contain more rings that are not immediately discernable. The rings appear to be double coursed; that is, two merging lines of rock are laid in roughly concentric circles.

We found occupational evidence in and around the rings, scattered over an area of 25 yards by 50 yards. The evidence consisted of bone showing butchering marks, a triangular projectile point, jasper cores, and chips of jasper, chert, agate and obsidian. The projectile point (Item 5 of Figure 13) appears similar in form to points of Mulloy's (1958) Middle Prehistoric period for the Northwestern Plains.

The position of the rings, on a low knoll above water, the size and shape of the rings as well as the presence of artifacts suggests that these rings are the remains of true shelter forms. This distinguishes the P-Don rings from the "ceremonial" rock alignments so widely found on the Northwestern Plains. We have no idea what sort of shelter form is represented by the rings.

"Tipi ring" is only a catch phrase; it does not necessarily imply a tipi (Hoffman 1953). At this time, the P-Don rings cannot be culturally identified other than as part of a wide-spread Plains phenomena. Probably they had a domiciliary function (Malouf 1961).

Two other tipi ring sites are found in the small area between Blacktail Deer creek and the P-Don site. One, 48YE335, lies only .3 mile east of the P-Don site on the first terrace south above the aforementioned drainage. 48YE335 is a single ring of about 15 feet in diameter. We found no occupational debris at this site nor did we find any basis for associating the ring with the P-Don site.

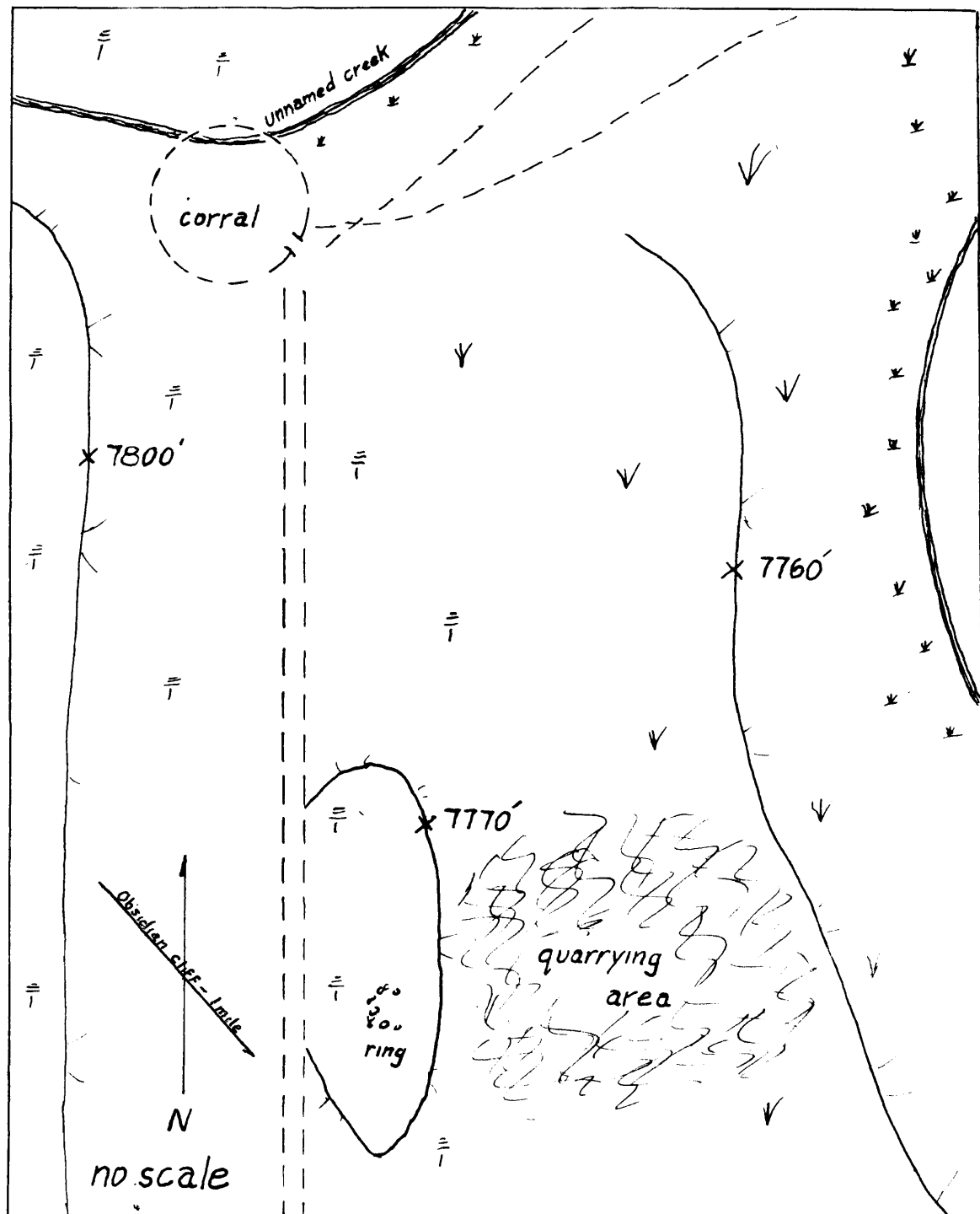
The Pot Hole site, 48YE332, is another single tipi ring site located $1 \frac{1}{10}$ miles northeast of the P-Don rings and $\frac{3}{32}$ of a mile northwest of the Blacktail Deer creek bridge (Figure 1). This readily discernable ring lies between two "pot holes" in the glacial till and overlooks Blacktail Deer creek from the latter's southwest side. We found no occupational debris on the ring itself, but a chip strewn area lay 50 yards south of the ring across from one of the pot holes. Occupational debris in the chip strewn area consisted of jasper and obsidian chips, materials indigenous to the area. There is no basis for cultural association between the ring and the chip strewn area; they are included under the same site number merely because of areal proximity.

48YE305

48YE305 is a quarrying site located on the western edge of a large meadow, one mile southeast of the confluence of Winter and Straight creeks and one mile west-northwest of famed Obsidian Cliff (Figure 3). The site area is marked by a small moraine that holds several large pieces of rhyolite mixed with columnar obsidian. That these "outcrops" have been quarried for the obsidian is evidenced by the great amount of spallings, chips and unfinished tools scattered about the eastern side of the moraine. The chip strewn area is overlaid in parts by a modern road and horse corral. No recognizable tools were found on the site or in the Mammoth Museum collection for the site. A single, incomplete tipi ring is located on the small moraine in a stand of lodgepole pine. At present, we know of no significance for the areal proximity of the ring to the quarrying portions of the site.

The columnar obsidian of 48YE305 is not the only source of obsidian on the site. The glacial till of the site area, like so much of northern Yellowstone Park, is studded with glacial obsidian pebbles. From our observations in Yellowstone Park, we suggest that glacial obsidian pebbles constituted a greater source of obsidian for prehistoric manufacturing than did blocks

Figure 3



48YE305 A QUARRYING SITE

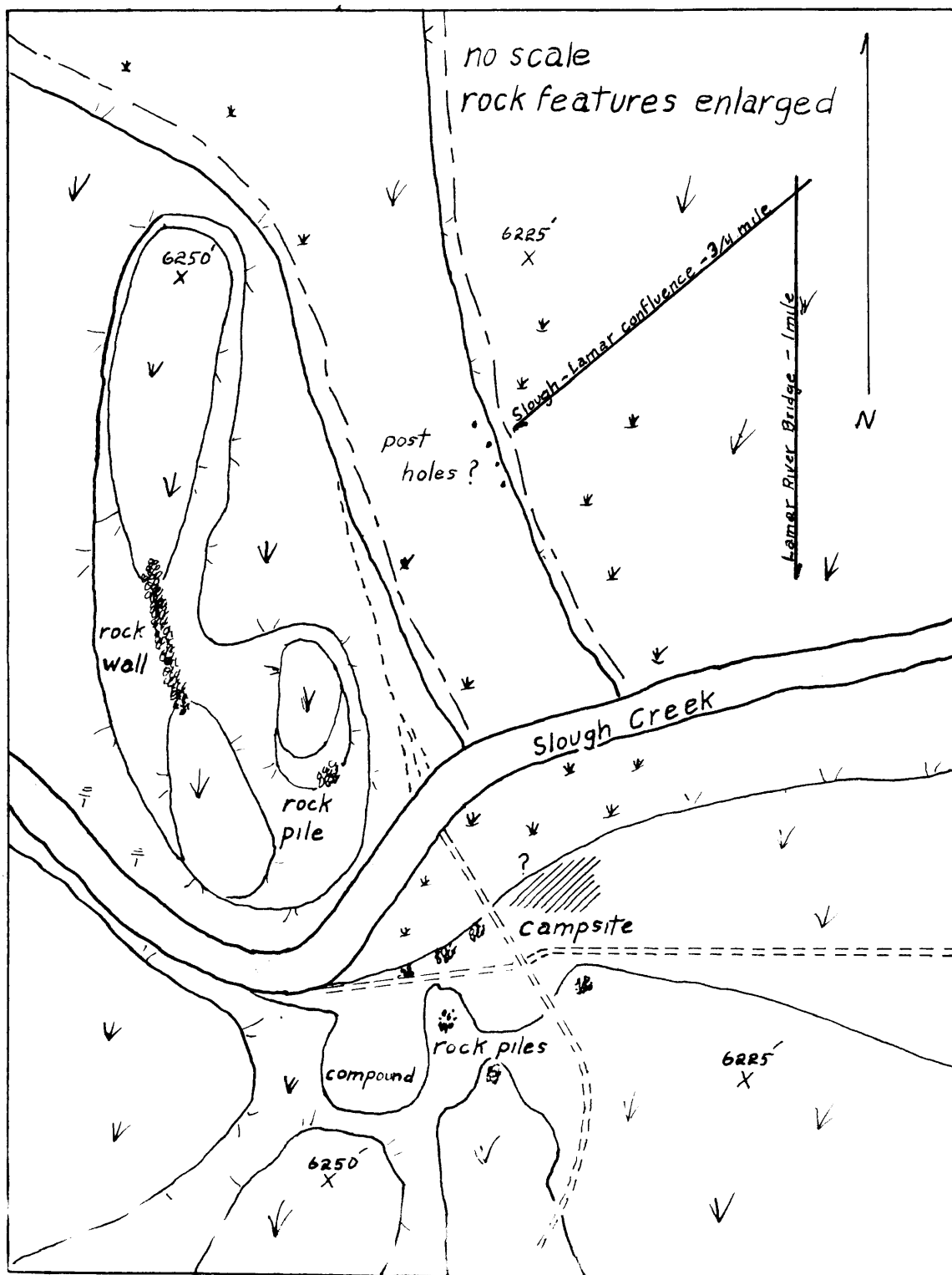
of columnar obsidian. This point is further discussed in the section on Observations and Conclusions.

THE SLOUGH CREEK COMPOUND

The Slough Creek Compound, 48YE420, is located on the north and south sides of Slough Creek three-fourths of a mile northeast of the confluence of the Lamar river and Slough creek (Figure 1). The site area is approximately a half-mile by a quarter-mile in size. It consists of a series of knolls and terraces overlooking Slough creek and two intermittent streams that enter the creek from the north (Figure 4). The site features are a series of rock piles, a rock wall, a series of post holes, what appears to be a campsite and at least one game compound. All features exhibited occupational evidence in the form of stone tools, chips and cores as well as butchered bone.

The site features are rather scattered about the area and suggest that more than one game compound is represented by the rock piles and wall. Unidentified animal bones were found projecting up through the till in a natural cul-de-sac on the south side of Slough creek (area marked "compound" on Figure 4). When we compared this bone with domesticated bison bone found on the surface of the site, we found that the bone in the till showed butchering marks and a greater amount of deter-

Figure 4



48YE420 THE SLOUGH CREEK COMPOUND

ioration. Small fragments of bone were found on the camp-site as well as a projectile point, pecking stone and scrapers. These tools are illustrated as Items 7 of Figure 15, 5 of Figure 17, 6 of Figure 21 and 5 of Figure 22.

The post holes on the north side of Slough creek seem to be out of context with the stone features of the site. I am not aware of any type of game drive on the Northwestern Plains where posts (placed in the ground) were used in conjunction with rock piles. However, I cannot deny the possibility that such a game drive type may exist. Certainly the position of the post holes is convenient to the cul-de-sac mentioned above or, perhaps, to a compound terminating in the rock wall west of the post holes. However, this is speculation and notwithstanding the presence of stone chips around the holes, the posts may represent a historic feature. The post holes are large (six inches in diameter) and well defined. As we could not formulate any definite pattern out of the stone features en toto, we have included the post holes as possibly being associated with the stone piles and wall. This is the old argument of, "Since nothing makes sense, include everything."

The rock wall on the west side of the site is about 75 yards long, 24 inches wide and 6 inches high. It is composed of smaller rock than that used in the rock piles; in fact, the smallest rock I have ever seen

used in a rock alignment. At present, I can only conjecture that the rock wall represents the terminus of another game compound.

Another possible compound may exist in a natural terrace indentation east of the cul-de-sac on the south side of Slough creek. This possibility is suggested by the position of the rock piles around the terrace indentation (Figure 4). I am not sure of the function of the solitary rock pile located just north of Slough creek.

The kinds of stone tools recovered from the Slough Creek Compound(s) are not sufficiently definitive to infer a close cultural or temporal identification of the site. Stone features and compounds are not uncommon to the Northwestern Plains. The lack of extensive bone deposits on the site suggests that the compound was little used and that the conjectured compounds may never have been used. Game compounds that show little use are usually associated with very Late Prehistoric and Historic times on the Northwestern Plains (Mulloy 1958).

FISHING BRIDGE PENNINSULA

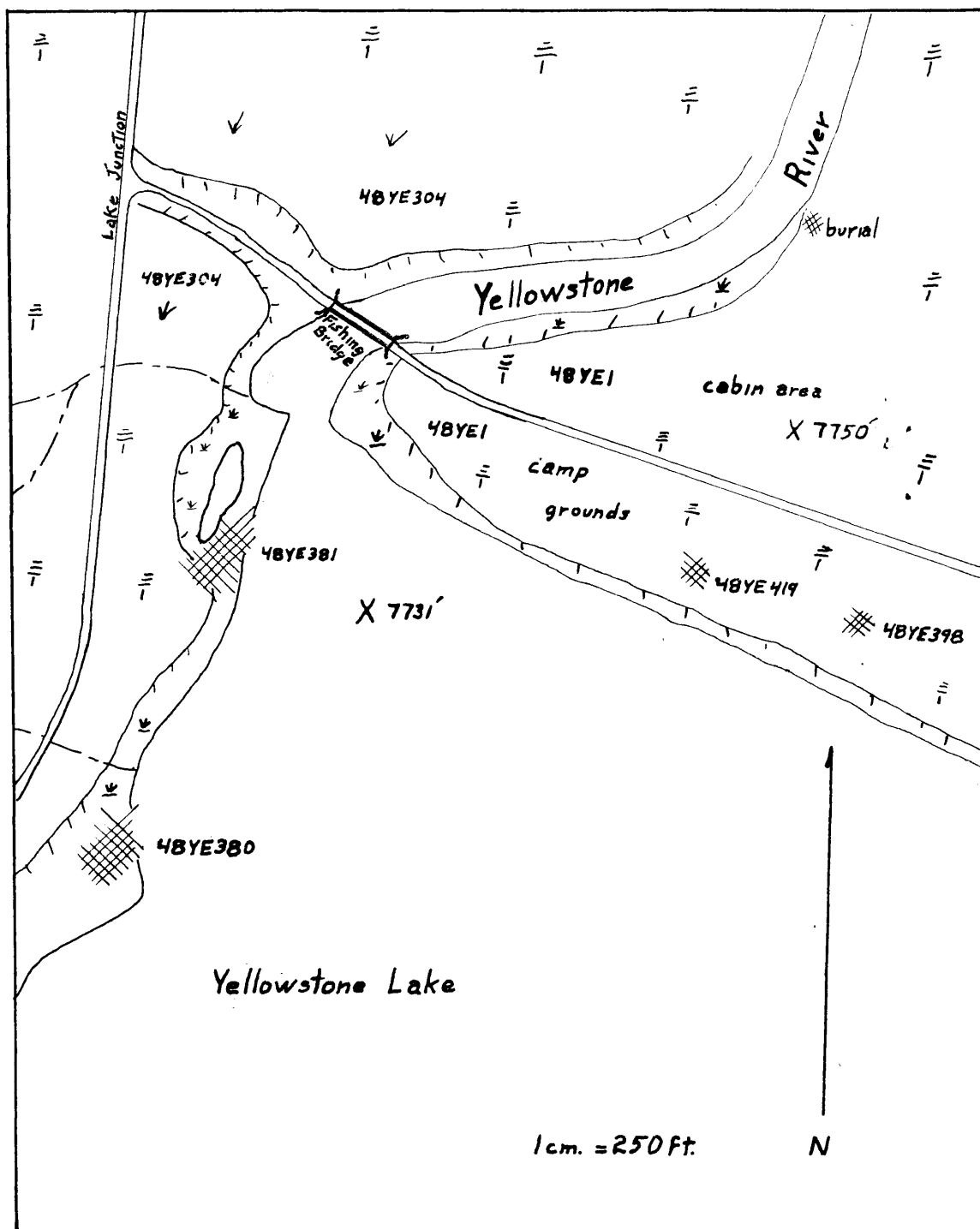
The Fishing Bridge Penninsula, 48YE1, is one of the largest sites recorded in Yellowstone Park. It occupies an area of about 17,500 square yards. The penninsula lies at the foot of Yellowstone lake and is formed by the lake and the outlet of the Yellowstone river

from the lake (Figure 5). The entire site area is overburdened by sand which was probably deposited during immediate post-Pleistocene times. The sandy beaches of the Fishing Bridge Penninsual appear to have been as attractive to prehistoric occupants as, in fact, they are to people of today.

The Fishing Bridge Penninsula is an extensive chip strewn area containing at least one burial (Condon 1948). While cultural debris in the form of stone chips is still extensive on the site, few stone tools were recovered by the survey crew or other agents of the Mammoth Museum in surface reconnaissance. Since definitive tools have been found on sites immediately adjacent to 48YE1 (Figure 5), the paucity of stone tools on the penninsula is probably due to the great number of tourists who have camped in the area in recent times. Almost the entire penninsula is either overlaid with modern structures or has been disturbed by excavations for parking lots, pipe lines and sewerage trenches. Undoubtably, some of these disturbances uncovered cultural evidences which were carried away by curious tourists or Park personel.

While the survey crew had nothing to do with the burial at Fishing Bridge Penninsula, we include a brief description of it here as an integral part of Yellowstone's archaeology. All remarks are based on Condon's report of 1948.

Figure 5



THE FISHING BRIDGE PENINSULA

The form of the grave opened at Fishing Bridge was a conoidal pit with an oval shaped mouth. The pit had a maximum depth of 40 inches and the mouth of the pit was overlaid by "large" rocks not indigenous to the peninsula. The walls of the pit indicated a stratigraphy of layered sand succeeded by a charcoal lens (continuous on the northern shores of Yellowstone lake - jjh) and topped by 4 inches of forest soils. Trees growing above the charcoal lens were dated in excess of two hundred years (the method of dating is not stated - jjh). The position of the body was flexed, face down and oriented to 260 degrees. The burial was that of an adult male who was 35 to 50 years old at time of death. He was accompanied by the bodies of two dogs. The cranial measurements of the adult male closely correspond to those of a modern Paiute. The dogs have broad crania but muzzles shorter than those of modern wolves or coyotes. The tools recovered from the burial consisted of a milling stone, maul, projectile points, drill and blade. Besides these stone tools, a flaker made of elk antler was found in the burial (Condon 1948).

The projectile points and blade (which I call a projectile point) recovered from the burial are illustrated as Items 7 of Figure 11, 2 of Figure 12 and 3, 4 and 5 of Figure 15. The drill is shown as Item 13 of Figure 22. The hand stones and flaker are no longer

available for measurements or photographs. The materials used in the manufacturing of the tools from the burial (the tools that I have seen) are the same as those in the chips scattered throughout the site. The materials, obsidian and chalcedony, are quite common in the area between Yellowstone lake and the Grand Canyon of the Yellowstone. The projectile points from the burial are discussed in the section on Typology and Relationships.

The extensive chip strewn area at Fishing Bridge suggests that the penninsula was often occupied for short periods of time by prehistoric peoples. On the basis of their style, the projectile points recovered from this site and adjacent sites (48YE304, 380, 381, 383, 398 and 419) suggest that the periods of occupation occurred in Middle Prehistoric and Late Prehistoric times.

THE LAVA CREEK WICKIUPS

A partially intact wickiup site, 48YE2, is located on the northern terminus of the Sheepeater Cliffs. in northern Yellowstone Park (Figure 1). The position of the site is a level terrace indentation a half-mile south of, and 1100 feet above, Lava creek and $1\frac{1}{2}$ miles southeast of the Gardiner river bridge. The terrace indentation contains a thick stand of lodgepole pine, yellow pine and aspen. Before the construction of a modern road

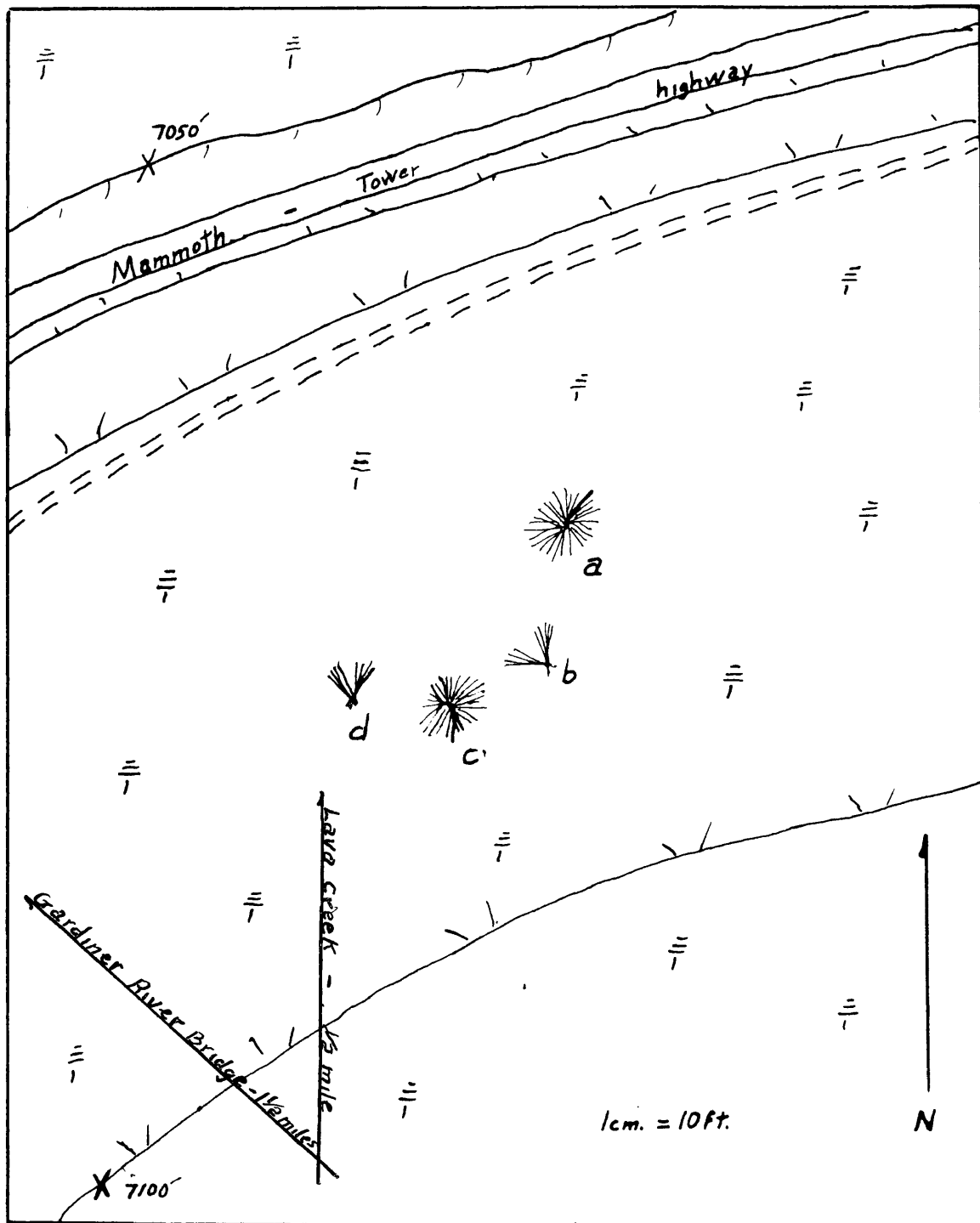
into the area, access to the site must have been difficult.

The site features are four wickiups that are more or less still intact. Two wickiups are standing (July 1958) and two have collapsed but still retain a semblance of their original form. The wickiups are arranged in an arc, the open side of which faces out and downslope to the northwest (Figure 6). The wickiups are constructed of poles from aspen and lodgepole pine. The poles are four inches and less in diameter. Rotting of the pole butts by ground contact has removed any cutting or breaking marks that may have existed.

Each wickiup exhibits a single, large pole resting on top of the crossed poles and roughly paralleling the other poles. This single, large pole appears to be an anchor pole; serving the same function as an anchor rope in a Plains tipi. In other words, pressure exerted at the poles' common focus creates a downward force and increases the stability of the shelter's framework.

Present day (July 1958) measurements of standing wickiups 'A' and 'C' (Figure 6) 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 poles are quite close together and suggest that only a superficial cover of brush or grass (if any cover) was used

Figure 6



48YE2 THE LAVA CREEK WICKIUPS

to finish the structures. The entrances to the wickiups appear to face toward the center of the arc, to the north and east.

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. We recovered several large pieces of elk bone consisting of femur, vertabrae and scapula from inside the wickiups. No other occupational debris lay within the wickiups, but we found small amounts of obsidian spallings 25 yards north of the structures within the site area.

Certainly the fact that the wickiups are still partially intact in a moist area suggests that they were built in Historic or very Late Prehistoric times (Mulloy, 1958, separates the two periods by the presence or absence of European material). Cultural identification of the structures is conjectural. Colonel Philetus W. Norris assumed that they were of Sheepeater (Tukuarika) origin and in 1879 described the site as, "... a wind and storm sheltered refuge for the feeble remnant of a fading race." (p. 10). The description is rather flowery but the Colonel had a point. As we noted in the Introduction, the Sheepeaters occupied certain portions of the Park sometime around 1870. Traditionally, the Sheepeaters had no horses. They were rather passive and somewhat

awed by horse-using peoples outside of the Park (this is supposedly the reason why they "retreated" into the Park). As we noted before, it would be quite difficult to reach the location of the wickiups were it not for a modern road. Moreover, the position of the site is well concealed by the contour of the mountainside and the heavy timber. It seems improbable that horse Indians would occupy such an area due to the scant forage and the difficulty of getting horses up the steep mountainside. Thus, Colonel Norris' identification is as worthy as anyone's at the present.

Apparently, Colonel Norris was quite enthusiastic about wickiups. In 1880 he elaborated on Sheep-eater occupation, reporting of, "... skin-covered lodges, or circular upright brush-heaps called wickiups, decaying evidences of which are abundant ... in nearly all of the sheltered glens and valleys of the Park." (p. 605). Granted that many timber fires have occurred in Yellowstone in the last eighty years, I find it rather strange that only one other wickiup site is known within the Park. This is the Wigwam Creek site, 24YE301, located one mile northeast of the confluence of Wigwam creek and the Gallatin river in the extreme northwest corner of the Park (Figure 1). Our information on this site is based on Replogle's observations as reported in 1956. Apparently only one intact wickiup remains on the site

as evidenced by a photograph on page 19 of Replogle's report. The wickiup exhibits the same form and construction, including the distinctive anchor pole, as the Lava Creek Wickiups. It seems probable that the wickiups of the two sites may be of the same type.

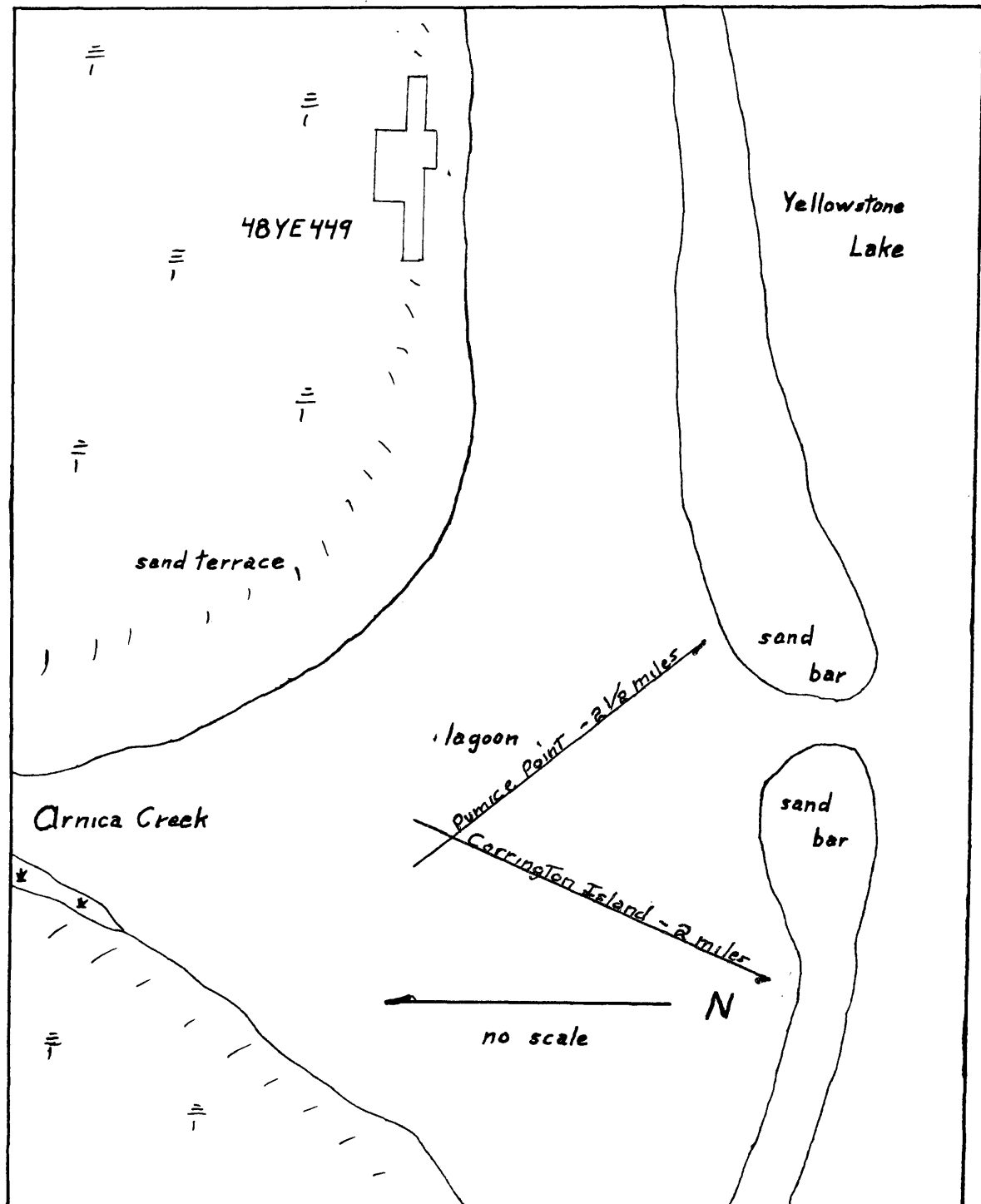
Various pole and brush structures were reported to the survey crew during its investigations in the Park. All of those that we investigated turned out to be recently built lean-tos (boy scout style), brush-piles or simply non-existent. It is not improbable that pole and brush structures other than 48YE2 and 24YE301 do exist in the more isolated areas of the Park. As yet, we simply have no evidence of such sites.

THE FIRST BLOOD SITE

The First Blood site, 48YE449, represents the first pottery find made on the Yellowstone Plateau. As the survey crew "drew its first blood" for pottery on 48YE449, we decided to test the site by partial excavation.

The site is located on the north shore of West Thumb bay, Yellowstone lake, on the east side of the mouth of Arnica creek (Figure 1). Position of the site is a large sand terrace overlooking a lagoon formed by Yellowstone lake and the mouth of Arnica creek (Figure 7). Both lagoon and sand terrace are features typical of the northern shores of Yellowstone lake. The sand terrace

Figure 7



48YE449 THE FIRST BLOOD SITE

at the site area parallels the lagoon in a due east-west direction, and stands seventeen feet above lake level (level of late July, 1959). The northern perimeter of the terrace is marked by a stand of lodgepole pine that extends to the upper crest of the terrace on the east and west sides of the site area. The site area itself lies between the upper and lower crests of the terrace.

Surface evidence as recovered by the survey crew was scanty but grouped in close concentration. The evidence consisted of four badly weathered pieces of pottery, including a lip sherd, found in association with a handful of stone chippings. Even such a poor sampling constituted a novelty for the area. Therefore, we decided to test the site.

We laid a six foot grid over the site area with an east-west base line running through the area of surface artifact concentration. The grid lines were numbered and lettered so that individual squares were referred to by specific terms. We dug a three foot wide (half square) exploratory trench along the south side of the base line for a distance of thirty-six feet or six squares. We then established an arbitrary working level of six to eight inches and peeled off the top of the exploratory trench to this depth. A culture-bearing level was encountered five inches below the surface of

the terrace. This level proved to contain cultural debris throughout the excavated portions of the site. The constant depth of the cultural level suggests that it represents an old surface of the sand terrace and that little topographic change has taken place in the terrace since the time of the site occupation.

The full area of three squares was excavated at the six to eight inch level as were the northern halves of four squares. We dug a three foot by six foot (half square) test pit twenty-four inches down beyond the working level in the northern half of one culture-bearing square. This was an attempt to find another, lower culture-bearing level. No other cultural level was found, neither did we encounter any firehearths or 'floor' areas.

A complete artifact assemblage for the tested portions of the site reads as:

33 pieces of pottery, including 6 lip sherds and 3 flanged base pieces.

1 spherical, fired pottery object; use unknown. The object appears to be complete and is 25 mm. in diameter.

1 obsidian projectile point of triangular form with wide corner notches, 29 mm. in length.

1 quartzite end scraper, 43 mm. in length.

1 obsidian chopper piece, 53 mm. in length.

31 chips of obsidian, chert, jasper, chalcedony and quartzite.

Little can be said regarding the stone tools recovered from the First Blood site. The only definitive tool, a projectile point, is of triangular form with a wide corner-notched butt (Item 15 of Figure 13). The point is pressure flaked and made of obsidian which can be considered a local material. On the basis of its form, the point appears to be of the Middle Prehistoric period; 3500 to 1,000 years ago (Mulloy 1958). The recovered chopper piece is also made of obsidian but of percussion manufacture (Item 12 of Figure 20). The quartzite end scraper is broken and appears well used (Item 4 of Figure 21). The size and wear of the scraper suggests that it was not hafted. The spherical pottery object is illustrated as Item 7 of Figure 17.

The recovery of the flanged, flat bottomed sherds gave us the first indication that we might be dealing with Intermountain or Shoshone pottery. However, we could not be sure of our identification without further analysis of the recovered specimens. A measurement of the pottery sherds showed that the body pieces average a thickness of 8 mm. Lip sherds average 8 mm. in thickness and thin to an average of 5 mm. at the lip point. The flanged, flat bottomed pieces were measured at an angle of 45 degrees through the flange and showed an average of 20 mm. in thickness. The lip. flange and

larger body pieces are illustrated on Figures 16 and 17.

Temper of the First Blood pottery is composed of sand containing quartz crystals, obsidian flakes and bits of rhyolite (this combination, coincidentally, is the composition of Yellowstone lake beach sand). The quartz crystals average 2.38 mm. in length, the obsidian flakes average 1 mm. in length and the rhyolite bits average 3.1 mm. in length. Thus, the overall size of the temper of the recovered sherds is coarse to granular (1 mm. to 4 mm. by the Wentworth scale). Both the sand particles of the temper and the paste particles are fine; less than .25 mm. in size. The composition of the paste has not been determined but the clay is probably of local origin. Clay of malleable quality is found in the Solution creek varves directly south and across the bay from the First Blood site. Also, mixed and kneaded clay can be obtained from the nearby West Thumb thermal area.

The exterior surfaces of the pottery sherds are quite soft. A scratch test of the sherds indicated a hardness of 2.5 by Moh's scale.

The recovery of a close concentration of sherds suggested that we had come upon a large section of a single pot. Laboratory reconstruction of the sherds confirmed this possibility. Our observations on the construction and firing of the pottery are based on:

the assumption that we were dealing with a single pot.

The exterior color of the pot ranges from buff at the base of its sides to reddish-brown at the lower body, and grey to black at the upper body and lip. The exterior of the flat bottom is grey to black. A cross-section examination of the sherds indicates that the lighter colors penetrated the exterior of the pot from 4 mm. at the base to 1.5 mm. at the lower body with little or no penetration at the upper body or lip. The exterior of the pot bottom shows no penetration of the lighter colors. The interior color of the vessel is grey at the base and ranges to black at the lip. The colors of the pot suggest that it was fired by oxidation. The diversity of colors and shallow penetration of the lighter colors indicate a rather poor oxidation of the pot with best results obtained at the base, but not the bottom. The pot was probably fired in a small, open hearth where the inflammable material was placed around the pot before being ignited.

The First Blood pot appears to have been built by hand modeling. We found no evidence of molding or coiling, whereas, finger indentations are quite evident on the exterior surfaces of the pottery. The even thickness of the vessel (other than the base) suggests that a paddle and anvil technique was used to finish the modeling process. This suggestion is further demonstrated by the compact texture of the exterior surfaces. The

exterior surfaces of the pot show narrow, shallow striations of irregular length and placement. This indicates that the unfired vessel may have been smoothed by a brush of grass or some other fiber. The interior surface of the pot is not as well smoothed as the exterior and does not have the quantity of finger indentations that the exterior has. Surface decoration is entirely absent on the First Blood pottery.

We attempted to reconstruct the recovered pot and achieved a fair amount of success. We tied in the lip to the upper body and the bottom to the base on one side of the vessel. Unfortunately, we were unable to bring the body and base together. Nevertheless, the reconstruction is sufficient to indicate the original form of the pot (Figure 8). The pot is a composite, 'shouldered' form. The form consists of a globular upper body on a straight-walled lower body resting on a flanged, flat bottom. The straight wall rises from the base at approximately 30 degrees from plumb, curves outward at the globular upper body and curves inward to the lip. The lip is slightly turned in. This form is strikingly similar to the one illustrated by Mulloy in his description of Intermountain pottery (1958, pp. 196-197).

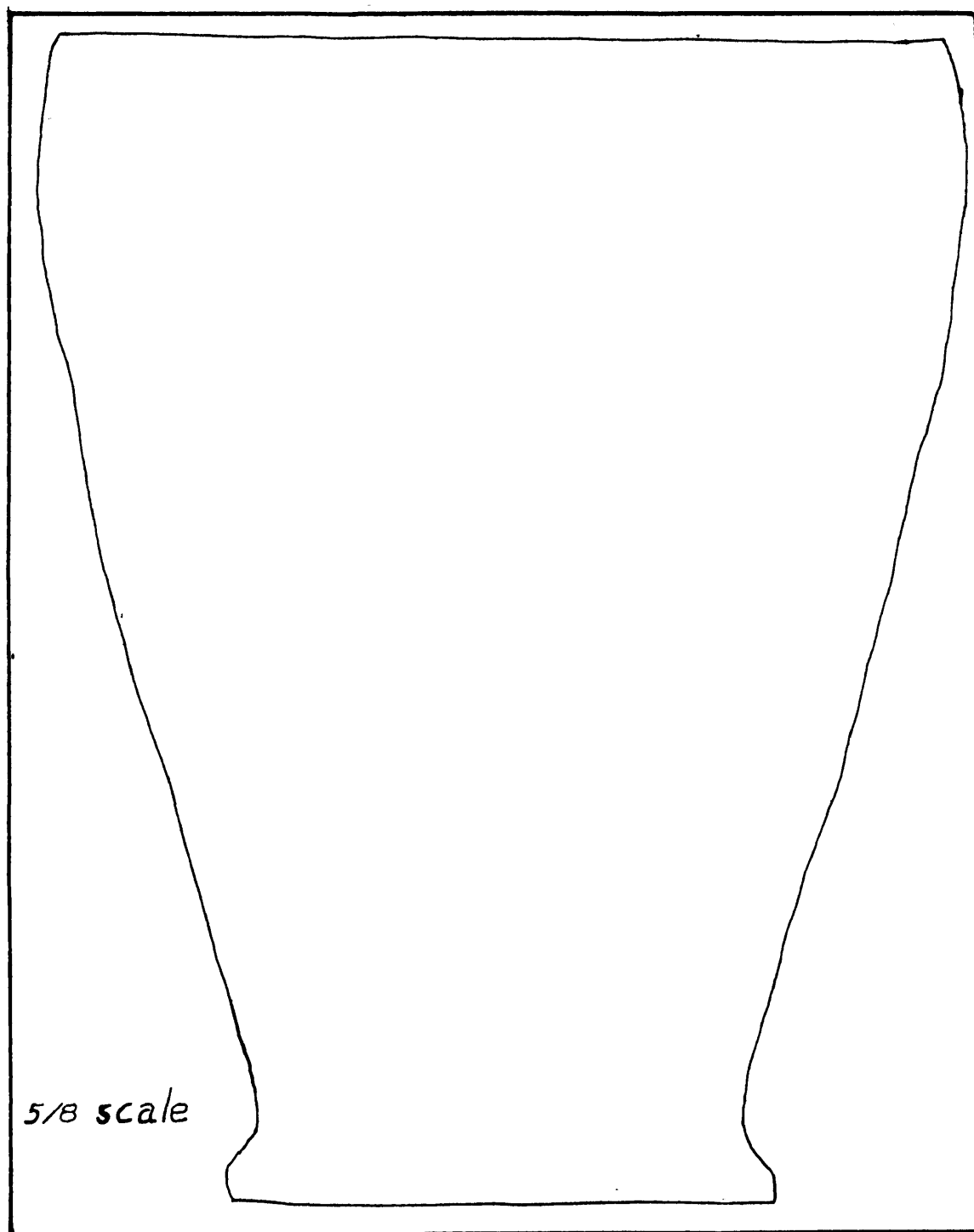
Based on partial reconstruction, the suggested measurements of the First Blood pot are:

| | | |
|--------------------------------|---|----------|
| mouth diameter | - | 20.5 cm. |
| upper body diameter | - | 21.1 cm. |
| base diameter including flange | - | 13.2 cm. |
| total height | - | 25. cm.? |

Since we were unable to tie the upper and lower bodies together, the total suggested height of the pot can only be an educated guess.

All crude, flat-bottomed pottery found on the Northwestern Plains is not Intermountain or Shoshone. Known makers of flat-bottomed pottery for this area include Blackfeet, Sarsi, Atsina, Kutenai, Arapaho, Assiniboine and Cheyenne (Ewers 1945). However, there is no ethnographic evidence that these people ever came onto the Yellowstone Plateau. In addition, these people migrated into the Northwestern Plains from the east and northeast. It is not likely that they could account for the distribution of flat-bottomed pottery in the Intermountain area south of the Yellowstone Plateau. This is not to imply a definite cultural boundary between the Northwestern Plains and the Intermountain area. Indeed, the presence of "horse Shoshone" on the Northwestern Plains in historic times shows the lack of a specific cultural boundary between the two areas. I do imply that the horse-using Shoshone functioned as a buffer group between the

Figure 3



SUGGESTED RECONSTRUCTION OF THE FIRST BLOOD POT

incoming peoples of the north and northeast, and the peoples of the Intermountain area.

Flat-bottomed pottery identified as Shoshone has been recovered from areas near to or adjacent to the Park (Lowie 1909, Schellbach 1930, Wedel 1954). The present, known distribution of Intermountain pottery runs from north-central Montana south to the Wyoming Basin and west to the northeast Great Basin (Mulloy 1958). In this discussion I have used the separate terms "Intermountain" and "Shoshone" and have implied a difference between the two. Yet, Intermountain pottery, by definition and distribution, includes Shoshone pottery (Mulloy 1958). In my opinion, the difference between Intermountain and Shoshone pottery is a difference of style based on vessel form. The Shoshone style form is usually straight-walled and flat-bottomed or, occasionally, a globular form with a rounded bottom. The Intermountain style form is a composite form with a flat bottom. The distinctive basal flange, when present, may be characteristic of either style. Both styles are Intermountain in type. This does not necessarily mean that the two styles are contemporary. The simpler Shoshone form may precede the composite Intermountain form. Indeed, the composite form may be derived from the simpler form. The distribution of the simpler Shoshone form runs from Nevada (Steward

1941) to Idaho (Schellbach 1930) to Wyoming (Wedel 1954) to Montana (Mulloy 1958). This is certainly a greater distribution than that of the composite Intermountain form. Form and distribution suggest the precedence of the simpler Shoshone style.

At present, the dating of Intermountain pottery is dependent upon association with better known pottery types. A mixture of Mandan/Hidatsa pottery and Intermountain pottery has been found in Montana at Pictograph Cave, level IV (Mulloy 1958). It is suggested that Mandan/Hidatsa pottery in Montana and Wyoming is Prehistoric and Historic Crow (Mulloy 1958; see also Mulloy 1942). Intermountain pottery has also been found mixed with sherds similar to Upper Republican pottery in Wyoming (Mulloy 1958). Proceeding from these associations, a Late Prehistoric and/or Historic period is indicated for Intermountain pottery.

The pottery recovered from the First Blood site fits the present description (Mulloy 1958) of Intermountain pottery on construction, material composition (as far as determined), vessel form and distribution. The importance of the First Blood site lies in the presence of Intermountain pottery in a previously "potteryless" area and the finding of this pottery type and style in a high altitude site.

In summary, I suggest that Intermountain pottery is both a type and a style. Intermountain style pottery differs from Shoshone style pottery in vessel form and in a smaller area of distribution. The simpler Shoshone style appears to have an earlier period of development than the composite Intermountain style. The First Blood pottery may be termed Intermountain in both type and style.

TYPOLOGY AND RELATIONSHIPS

The classification of projectile points recovered from Yellowstone Park is based mainly on familiar point types of the Northwestern Plains (Mulloy 1954 and 1958, Wormington 1957). The basic classification is augmented by my observations on the different point shapes recovered by the survey crew and those on deposit at the Mammoth Museum.

The criteria for establishing point styles are based on blade form and butt form; the latter of which I consider to be the more sensitive criterion. The term "butt" as used in this classification includes the base, tang and barbs of a projectile point. The butt is considered as that part of the projectile point that is used to haft the blade to the shaft. The criteria of butt size, blade size and total point size are held to be only relative to this classification. Blade and butt thicknesses and cross-section shapes are held to be secondary criteria; useful for establishing relationships but not used for classifying point shapes. I do not feel that the criterion of material composition is particularly valuable to points found on the Yellowstone Plateau due to the abundance and diversity of local material.

Blade form is broken down into three basic classes, 1.) lanceolate blades, 2.) parallel-sided

blades and 3.) triangular blades. No other basic blade form was recovered by the survey crew. Butt form is broken down into fourteen specific classes based on apparent butt shapes. These fourteen classes are defined as follows:

1. Parallel butt, straight to convex base.
Extended butt with roughly parallel sides, base of butt is straight to convex.
2. Parallel butt, indented to concave base.
Extended butt with roughly parallel sides, base of butt is indicatively indented to pronouncedly concave.
3. Piriform butt.
Extended butt with restrictedly arching sides meeting at a pronounced point at base of butt.
4. No butt, indented to concave base.
Butt and blade are contiguous and indistinguishable, base of point is indicatively indented to pronouncedly concave.
5. No butt, straight to convex base.
Butt and blade are contiguous and indistinguishable, base of point is roughly straight to convex.
6. Fishtail butt, indicative.
Butt of point resembles a fishtail, butt is indented bilaterally and basally.
7. Fishtail butt, pronounced.
Similar to above form but more pronounced. Lateral and basal indentations are more obvious, often giving a flared appearance to the butt.
8. Corner notch, wide.
Notches enter butt at angle greater than 90 degrees to longitudinal axis of point. Notches are wide and from shallowly to moderately indented. Notches are occasionally so wide as

to give a greatly sloping appearance to the sides of the butt.

9. Corner notch, narrow.
Notches enter butt at angle greater than 90 degrees to longitudinal axis of point. Notches are narrow and from moderately to deeply indented.
10. Side notch, wide.
Notches enter butt at angle of roughly 90 degrees to the longitudinal axis of point. Notches are wide and from shallowly to moderately indented. Notches are occasionally so wide as to give a gently sloping appearance to the butt sides.
11. Side notch, narrow.
Notches enter butt at angle of roughly 90 degrees to longitudinal axis of point. Notches are narrow and from moderately to deeply indented.
12. Trinotch, indicative.
Wide, shallow notches enter butt at 90, 180 and 270 degrees. Often resembles form number 10 with the addition of a pronounced, rounded basal notch.
13. Trinotch, pronounced.
Narrow, deep notches enter butt at 90, 180 and 270 degrees. Often resembles form number 11 with the addition of a 'V' notch in base of the butt.
14. Shouldered butt.
Butt is differentiated from blade by slight setback and has parallel sides. Base of butt is straight to slightly convex.

No allowance is made in this classification for the criteria of fluting, flaking techniques or scars, polishing or grinding. These are held to be specialty criteria to be applied after the basic criteria of form has been applied.

All projectile points included in this typology

have been either recovered in actual field survey or selected from the collections on deposit at the Mammoth Museum. Only projectile points that could be definitely assigned to recorded sites were selected from the museum collections.

The relationships for the Yellowstone point styles have been drawn from the conceptual framework presently used for historical reconstruction on the Northwestern Plains. This framework is a conceptual ordering of generalized cultures based on their ecological adaption as this is suggested by tool types. The conceptual framework is quite recent (1958) and has yet to be expanded to include regional manifestations within the generalized cultures. These modes of human ecological adaption have arbitrary temporal limits. The arbitrary time units are termed Early, Middle and Late Prehistoric periods. In addition, the Middle Prehistoric period is divided into the sub-units, early and late. Generalized cultures and arbitrary time units compose the historical framework of the Northwestern Plains (Mulloy 1958).

Chronology of the Prehistoric periods is not yet fully developed. All dates mentioned in this manuscript are to be considered as suggested dates.

The suggested terminal date for the Early Prehistoric period on the Northwestern Plains is 6,000 years ago (Mulloy 1954). As we noted in the section on

general Park description, Yellowstone's Pleistocene period seems to have ended some 10,000 to 8,000 years ago. The Park's Early Prehistoric period did not likely begin before 10,000 years ago. The Middle Prehistoric period began sometime before 3500 years ago (an extreme date of 6500 years ago is suggested by Mulloy, 1954, p. 449, by a C14 analysis of material in the lower level of the McKean site). The early and late substages of the Middle Prehistoric period are characterized as similar, widespread complexes that are culturally distinct (Mulloy 1954). Mulloy (1958) places the Middle Prehistoric terminal date at 1500 years ago. I suggest a later terminal for the Park of about 1,000 years ago; this date being based on the traditional date for the entry of the Woodland cultures onto the Plains. The Late Prehistoric period began sometime around 1500 years ago. The division between Late Prehistoric and Historic times is made on an individual site or site level basis. This basis is characterized as the presence or absence of European contact material (Mulloy 1958). Within this sketchy framework we shall discuss the Yellowstone Park projectile point types.

Type L1. Lanceolate points with parallel-sided butts having straight to convex bases. Items 1, 2, 3 and 4 of Figure 9 illustrate this type. Item 2 appears quite similar to one form of Hell Gap point (Agogino 1961, Item

Figure 9



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4



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a, Figure 1, p. 559). It exhibits grinding on the butt sides and oblique flaking on the blade. The form of Items 2, 3 and 4 suggest them as being of the Early Prehistoric period. Item 1, while of the same basic form as the others of Type L1, is probably of early Middle Prehistoric designation (Mulloy 1958).

Type L2. Lanceolate points with parallel-sided butts having indented to concave bases. This type is represented by a single specimen among the Yellowstone points; Item 5 of Figure 9. This point approximates Mulloy's "variant McKean" type from the lower level of the McKean site which is suggested as being of the early Middle Prehistoric period (Mulloy 1954).

Type L3. Lanceolate points with piriform butts. Item 7 of Figure 9 shows the single specimen of this type. This point is also like points assigned to the early Middle Prehistoric period (Mulloy 1958).

Type L4. Lanceolate points with no butts, having indented to concave bases. This type is shown as Items 6, 8, 9, 10 and 11 of Figure 9. Item 6, while of the same basic form as the other points of this type, is probably of Late Prehistoric times (Mulloy 1958). Item 9 has a very small indentation in the butt and may possibly be an unhafted knife rather than a point. Item 8 is a rather thin point with oblique, bifacial flaking. I can find no exact relationship for this point but

Figure 10

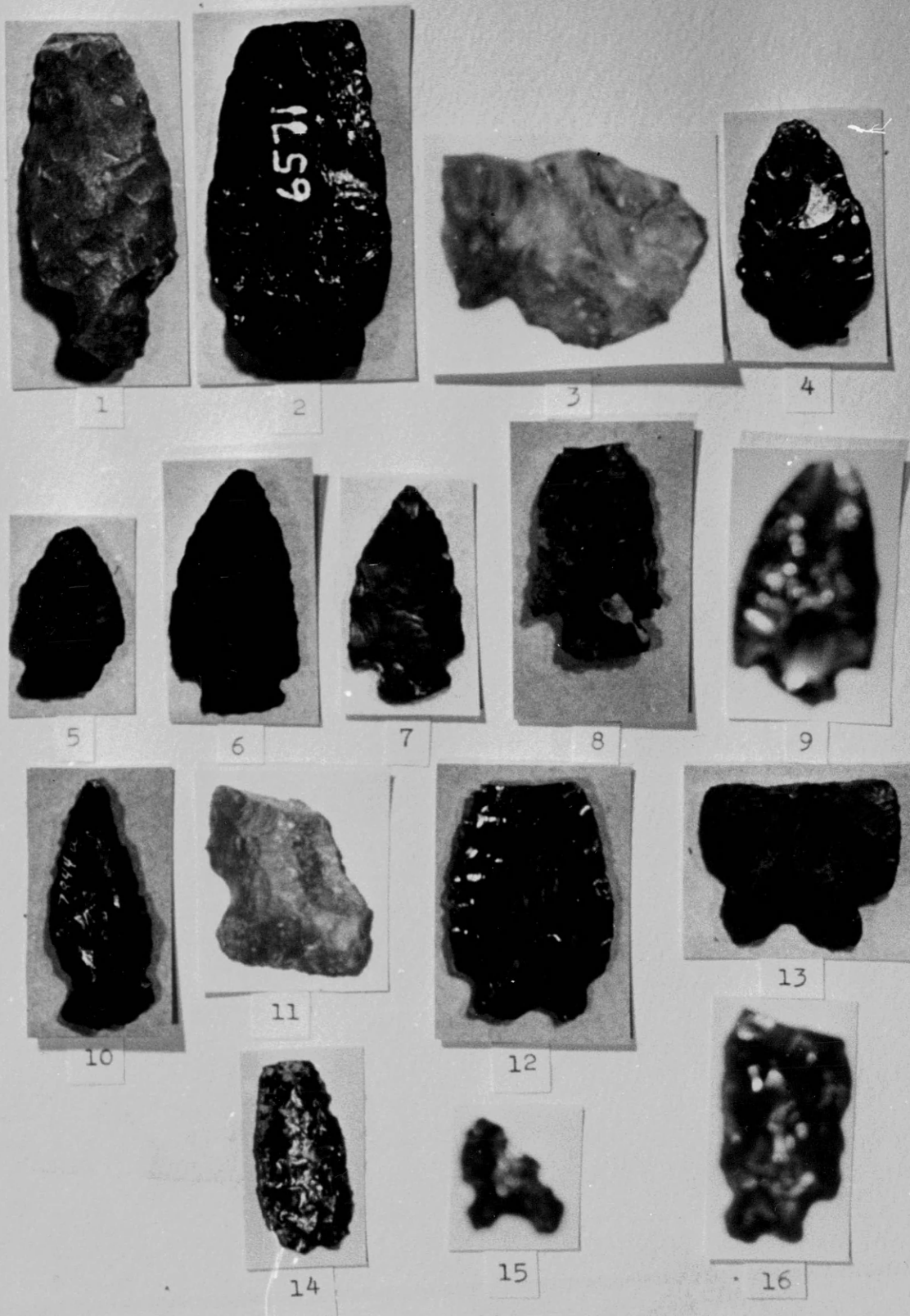


projectile points full scale

suggest an Early Prehistoric designation on the basis of its form and flaking. Items 10 and 11 are of especial interest. Item 10 has a prepared surface at its base as if readied for fluting. Item 11 exhibits Folsom-like "ears." Both points are quite thick and suggest generalized Folsom characteristics. The style of these two points suggests an Early Prehistoric designation.

Type L5. Lanceolate points with no butts having convex to straight bases. Item 5 of Figure 10 shows the single specimen of this type. The large, basaltic point exhibits extensive bifacial thinning that extends from the base almost to the tip. The edges of the point appear to have been flaked before the bifacial thinning took place. The result is an unusually thin point for such a form. I know of no exact relationship for this point in context of the Plains area. The form and flaking technique as well as the size suggest that this point belongs to the Early Prehistoric period.

Type L6. Lanceolate points with indicative fish-tail butts. This point style is sometimes referred to as a "swallowtail" style. More specifically, this point style is found in the lower level of the McKean site (Mulloy 1954). Mulloy (1958) calls the style Pictograph Cave I, Type III. The Yellowstone points of this type are shown as Items 1 to 4 and 6 to 13 on Figure 10. Points of this style are identified at Pictograph Cave



projectile points full scale

and the McKean site as being of the early Middle Pre-historic period (Mulloy 1958).

Type L7. Lanceolate points with pronounced fish-tail butts. Items 14 to 18 of Figure 10 illustrate Type L7. This appears to be a logical style progression of Type L6 yet shows enough variation in butt form to be considered another type. In addition, I have separated the two types since L6 appears to progress into a wide side-notched style butt, whereas, L7 appears to progress into a wide corner-notched style butt. This progression is best shown at Pictograph Cave and in the seriation of McKean site points. Points of the same style as Type L7 are suggested as being of the early Middle Prehistoric period (Mulloy 1958).

Type L8. Lanceolate points with wide corner-notched butts. The Yellowstone points of this style are shown as Items 1 to 8 of Figure 11. Item 7 is one of the points recovered from the Fishing Bridge burial discussed in the section on Yellowstone's sites. The butts of Items 1, 2 and 3 are fragmentary -- the photos do not clearly show the difference between the notch lines and the break lines. Type L8 is variously referred to as Signal Butte I (Strong 1935), Pictograph Cave II (Mulloy 1958) and McKean upper level (Mulloy 1954). These sites place L8 in the late Middle Pre-historic period.

Figure 12



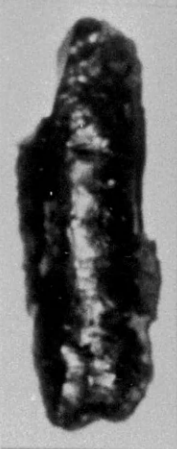
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projectile points full scale

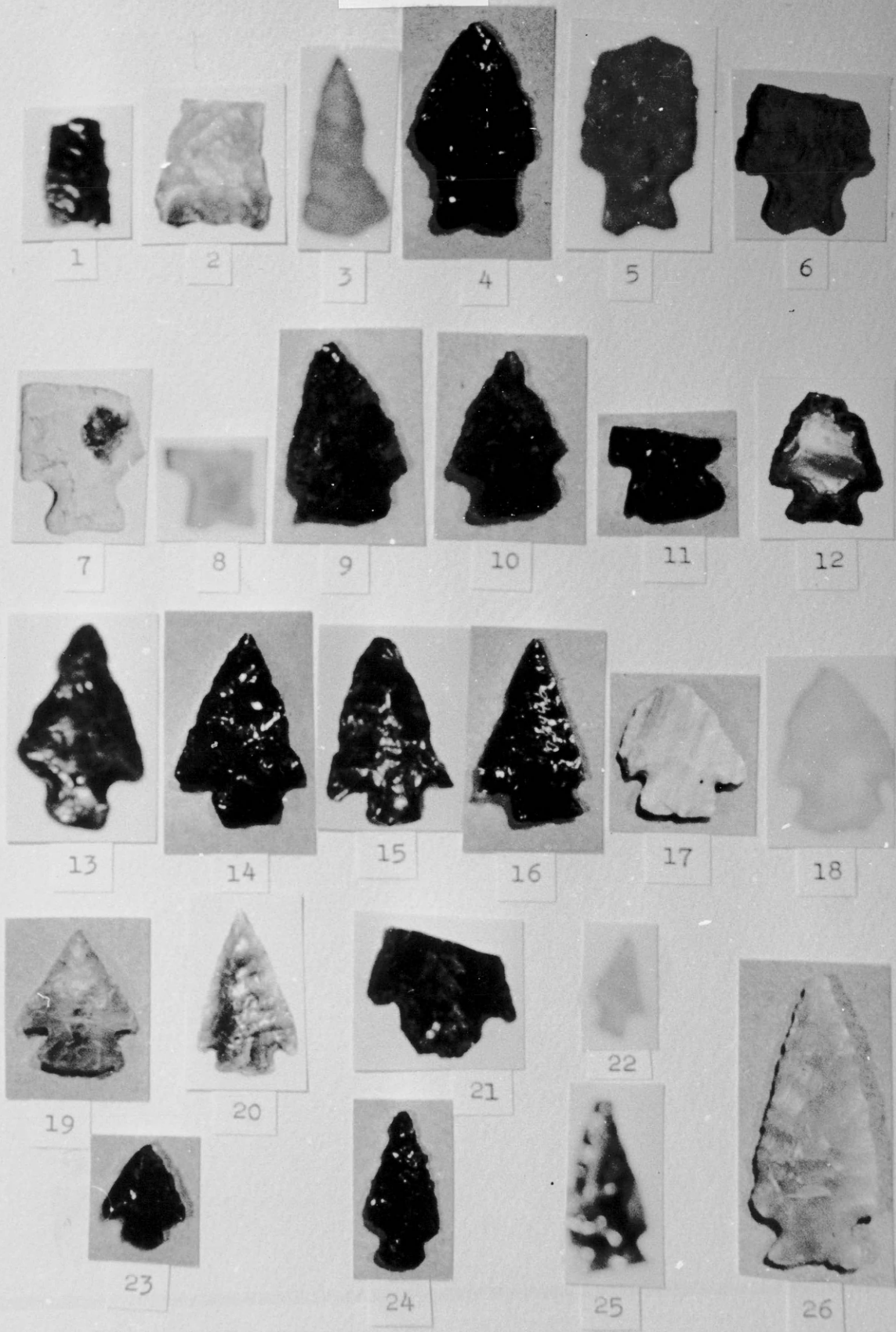
Type L9. Lanceolate points with narrow corner-notched butts. This type is represented by a single specimen -- Item 9 of Figure 11. The blade and butt form suggest that this point is of the late Middle Prehistoric period (Mulloy 1958).

Type L10. Lanceolate points with wide side-notched butts. Items 10 and 11 of Figure 11 show Type L10. Despite the dissimilarity of flaking scars and point size between the two specimens, both styles are reported from the upper level of the McKean site. A late Middle Prehistoric designation is suggested for these points (Mulloy 1954).

Type L12. Lanceolate points with indicative trinotched butts. The Yellowstone points of this type are illustrated as Items 12 to 16 of Figure 11. Type L12 appears to be a stylistic progression of Type L6. Both styles are reported in the lower level of the McKean site (Mulloy 1954). Thus, Type L12 also belongs to the early Middle Prehistoric period (Mulloy 1958).

Type L14. Lanceolate points with shouldered butts. Items 1, 2 and 3 of Figure 12 illustrate this point type.. Item 1 is strikingly similar to another form of Hell Gap point (Agogino 1961, Items c, e and f, Figure 1, p. 559). Hell Gap points at the type site have a C14 dating of about 11,000 years ago (Agogino 1961). The style of Items 2 and 3, and the relationship of 1,

Figure 13



projectile points full scale

suggest an Early Prehistoric designation for these points.

Type P4. Parallel-sided points with no butts, having indented to concave bases. Item 5 of Figure 12 has a rather thick, lenticular cross-section as evidenced by its broken blade. While I know of no exact relationship for this point, I suggest an early Middle Prehistoric designation on the basis of its form (Mulloy 1958).

Type P14. Parallel-sided points with shouldered butts. Yellowstone points of this type are shown as Items 4 and 6 of Figure 12. Item 4 has been reworked at the tip of the blade. Despite its fragmentation it exhibits fine, oblique flaking scars and a wide, diamond-shaped cross-section. The flaking scars of Item 6 have been badly worn by the sand and water of Yellowstone lake. The cross-section of this point is also a wide, diamond shape. Item 4 bears a resemblance to Eden Valley style points. The form and cross-section shapes of these specimens suggest that they belong to the Early Prehistoric period.

Items 7 to 11 of Figure 12 are unfinished and/or broken forms. I have made no attempt to class these specimens. They are included as being of possible interest.

Type T4. Triangular points with no butts having indented to concave bases. The thin cross-sections and small sizes of Items 1 and 2 of Figure 13 suggest that they are true arrow points. In any event, small triangular points without notches are suggested for the

Figure 14



projectile points full scale

Late Prehistoric period (Mulloy 1958).

Type T5. Triangular points with no butts having convex to straight bases. Item 3 of Figure 13 shows the single specimen of this type. The thin, delicately flaked point is probably an arrow point. A Late Prehistoric designation is suggested for this point.

Type T6. Triangular points with indicative fishtail butts. Item 4 of Figure 13 appears to be a variant form of Type L6. Both forms are found in the lower level of the McKean site and are included in Type III points of Pictograph Cave I (Mulloy 1958). Type T6, like L6, is of the early Middle Prehistoric period.

Type T7. Triangular points with pronounced fishtail butts. Items 5 to 8 of Figure 13 illustrate the Yellowstone points of this type. Type T7 appears to be a stylistic progression or variant of Types L6 and L7. All three forms are included in Pictograph Cave I, Type III points and the lower level of the McKean site. These sites indicate that Type T7 is of the early Middle Prehistoric period (Mulloy 1958).

Type T8. Triangular points with wide corner-notched butts. Items 9 to 26 of Figure 13 show Type T8 points. Points resembling these are found in the upper level of the McKean site and in level II of Pictograph Cave. A late Middle Prehistoric designation is suggested

Figure 15



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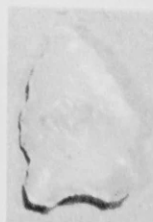
14



15



16



17



18



19

projectile points full scale

(Mulloy 1958). The size of the illustrated items suggests that they are arrow points. Item 15 was found in stratigraphic association with Intermountain pottery (section on Yellowstone's sites). At present, pottery on the Northwestern Plains is suggested for the Late Prehistoric and Historic periods only (Mulloy 1958). The apparent problem of recoupling a Middle Prehistoric point style with a Late Prehistoric trait is not an actual problem. Item 15 probably represents a single segment of technical conservatism.

Type T9. Triangular points with narrow corner-notched butts. Items 1 to 10 of Figure 14 show points of this type found within the Park. Item 11 is from the Stevens creek area just over the northern Park boundary. These point styles have been found in level II of Pictograph Cave and the upper level of the McKean site (Mulloy 1958). On the basis of these sites, the points are suggested as of the late Middle Prehistoric period.

Type T10. Triangular points with wide side-notched butts. Items 12 to 22 of Figure 14 illustrate the Yellowstone points of this type. Our best identification of these points is in level III of Pictograph Cave which is suggested as Late Prehistoric (Mulloy 1958). The suggested, stylistic progression of wide side-notched butts from indicative fishtail butts is most apparent in Items 12, 13, 17 and 20. Points approx-

imating these latter specimens comprise a small minority of points in the upper level of the McKean site. The resemblance, however, is only in butt form -- the McKean specimens have lanceolate blades and are larger in total point size.

Type T11. Triangular points with narrow side-notched butts. Points of this type are shown as Items 23 to 27 of Figure 14, and Items 1 to 6 of Figure 15. With the exception of Item 10, Figure 15, these points are small, thin in cross-section and delicately flaked. They are suggestive of arrow points. The form and size of T11 points suggests that they are of Late Prehistoric times (Mulloy 1958). The size and symmetry of Item 10, Figure 15, in context with its temporal identification suggests a ceremonial rather than economic function for this point. Items 3, 4 and 5 of Figure 15 were recovered from the Fishing Bridge burial.

Type T12. Triangular points with indicative trinotched butts. Items 7 to 9, 11 to 13, and 15 to 18 of Figure 15 show the Yellowstone points of this type. Item 11 appears aberrational to this class and is probably an unfinished form. Item 8 exhibits flaking on one face only and is probably unfinished also. Trinotched points are suggested for the Late Prehistoric period (Mulloy 1958).

Item 14 of Figure 15 is a small, single should-

ered point with a thick cross-section and a piriform butt. I have not classed this form nor do I know of a relationship for this point.

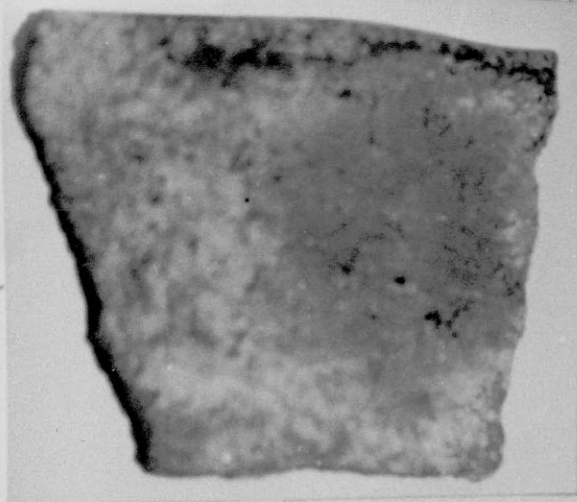
Type T13. Triangular points with pronounced trinotched butts. Item 19 of Figure 15 represents the single specimen of this type found in the Park. The pronounced trinotch butt suggests a stylistic progression or variant of the indicative trinotch butt. Both forms are suggested for the Late Prehistoric period (Mulloy 1958).

The suggested temporal classification of the projectile points discussed in this section can be outlined as:

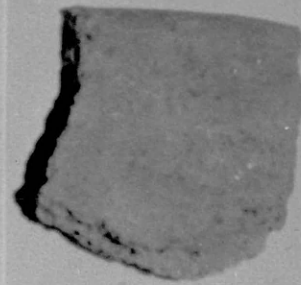
| | |
|---------------------------------|---------------|
| Early Prehistoric period | 12 specimens |
| early Middle Prehistoric period | 31 specimens |
| late Middle Prehistoric period | 37 specimens |
| Late Prehistoric period | 38 specimens |
| unidentified points | 7 specimens |
| total points | 125 specimens |

The significance of this outline is discussed in the section on Observations and Conclusions.

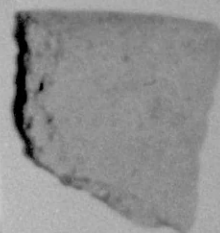
Figure 16



1



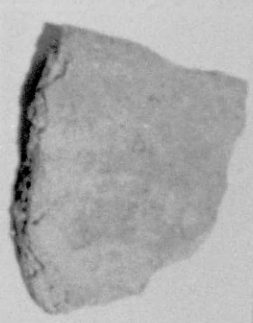
2



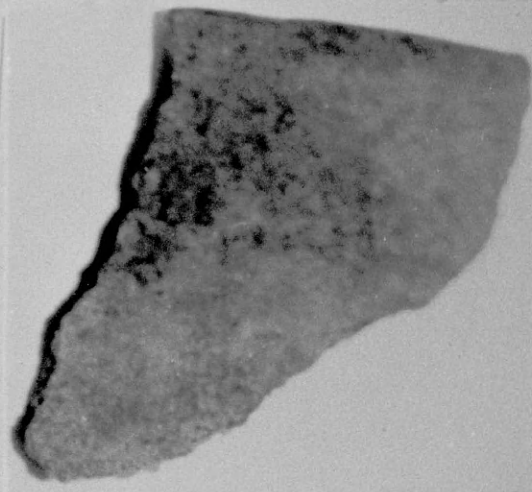
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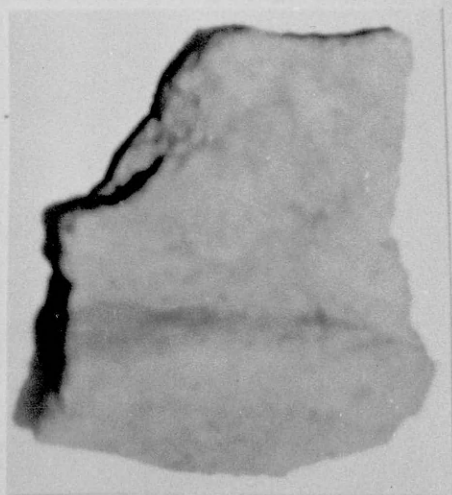
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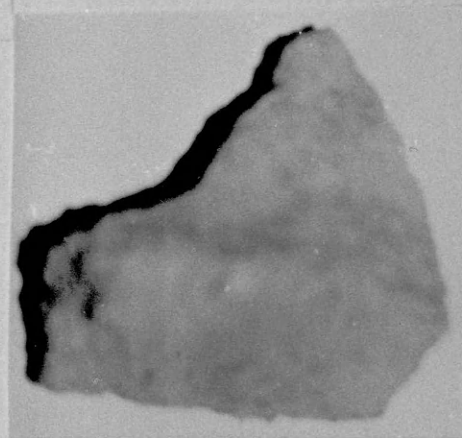
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8

pottery sherds full scale

MISCELLANEOUS ARTIFACTS

Not all of the artifacts recovered during the Yellowstone survey have been typed by form and interpreted by form classes. The diversity of blades, drills, graters and scrapers presents a bewildering assortment of tool forms to the budding archaeologist. Yet these same tools, viewed on a more or less individual basis, can give us an indication of the Park's cultural history. In this section we will discuss the miscellaneous artifacts of Yellowstone Park and interpret their significance later in the section on Observations and Conclusions.

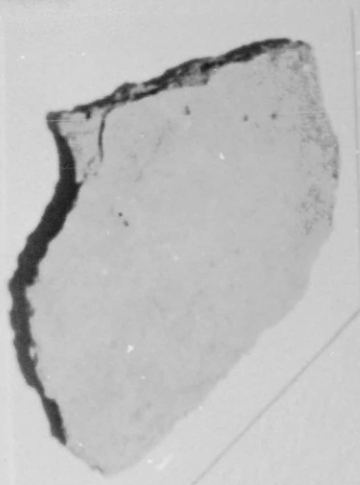
Items 1 to 8 of Figure 16, and 1 and 2 of Figure 17 are large sherds from the First Blood pot (Figure 8). Items 1 to 6 of Figure 16 are lip sherds, while 7 and 8 of Figure 16 and 1 of 17 are base sherds that exhibit the distinctive basal flange often found on Intermountain pottery. Item 2 of Figure 17 is a curved piece from the upper body of the pot.

Item 3 of Figure 17 appears to be a fossilized root-replacement of chalcedony. It was recovered in surface association with an obsidian projectile point at site 48YE314. The Type T10 projectile point is suggested as being of the Late Prehistoric period. The fossilized object exhibits extensive smoothing on all sides

Figure 17



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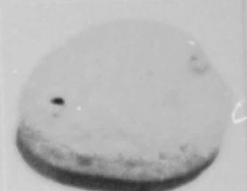
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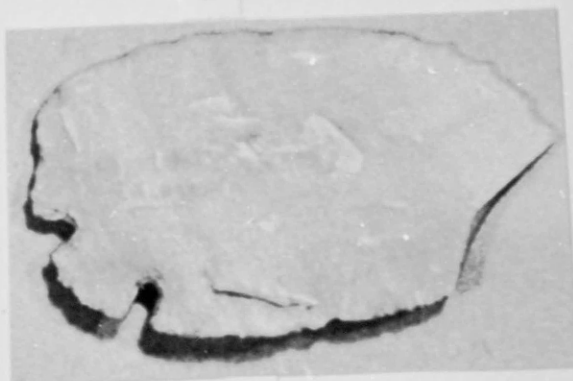
5



6



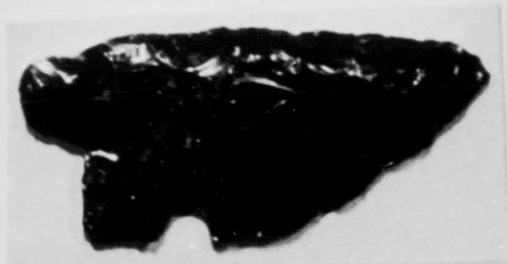
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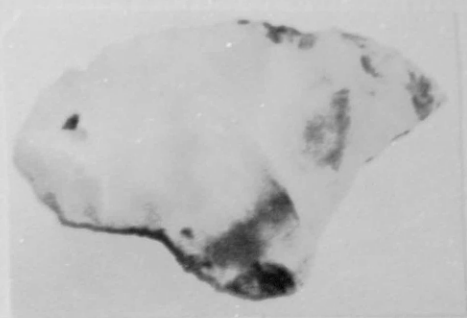
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11

with the exception of the broken (lower) end. The unusual form of the object and its smooth appearance suggest that it may have been part of a medicine bundle.

Item 4 of Figure 17 is a fragmentary blade that shows rather fine flaking. Although the blade is too fragmentary to be of significance, I have included it as being of possible interest.

Items 5 and 6 of Figure 17 are smoothed rhyolite pecknig stones that show striking marks on their ends. Within my observations, well smoothed rhyolite pebbles do not occur naturally in the Park due to the softness of the material. The smoothness of these pecking stones suggests that they were used for abrading and/or grinding purposes as well as pecking.

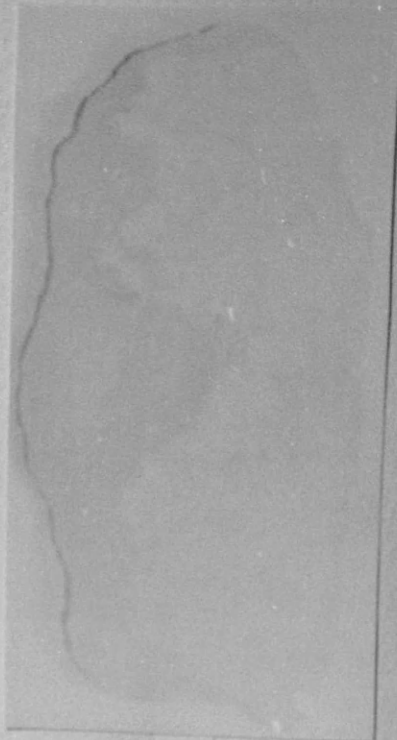
Item 7 of Figure 17 is a spherical baked-clay object recovered in stratigraphic association with Intermountain pottery. The object is more fully described in the discussion of the First Blood site in the section on The Sites Within Yellowstone Park.

Items 8, 9 and 10 of Figure 17 are corner-tanged knives from diverse areas of the Park. Item 8 is from the Firehole river in the west-central part of the Park, Item 9 from the north shore of Yellowstone lake and Item 10 is from Mammoth Hot Springs in the extreme northern part of the Park. The corner-tanged knife has apparently been used for a long time on the Plains. It is

Figure 18



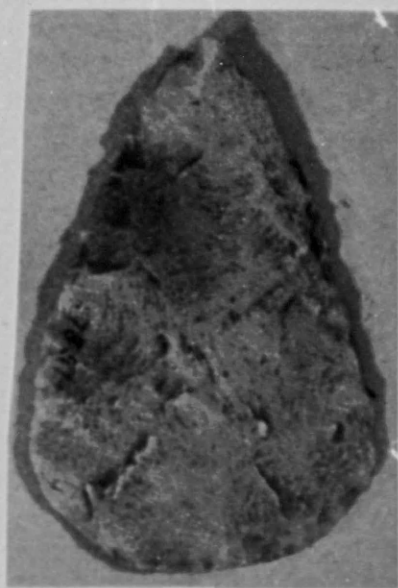
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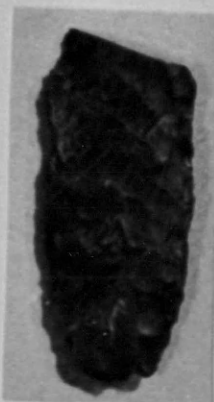
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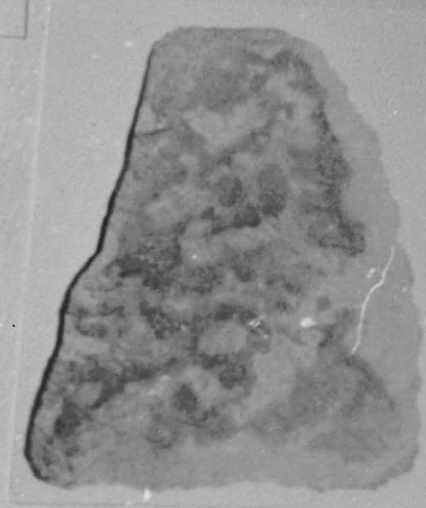
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7

blades and knives . full scale

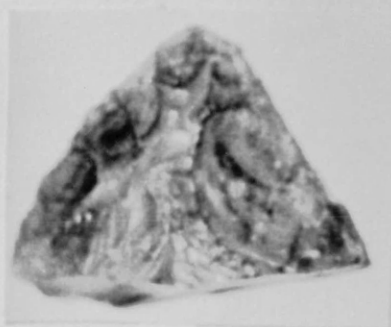
found in level I of the Signal Butte site (Strong 1935) which is dated by C14 at about 3400 years ago (Griffin 1952). The corner-tanged knife appears on the Northwestern Plains during early Middle Prehistoric times and continues into Late Prehistoric times (Mulloy 1958).

Item 11 of Figure 17 appears to be an end-hafted crescent-shaped knife. While the form of this knife is suggestive of Woodland forms, I know of no relationship for this form on the Northwestern Plains.

Items 1 to 7 of Figure 18 are large blades and knife butts. Items 2 and 7 are bifacially percussion flaked. Item 6 exhibits regularly placed, oblique flaking scars.

Items 1 to 15 of Figure 19 are various forms of knives and blade pieces. Items 7 and 8 appear to be obliquely hafted knives of the Late Prehistoric period (Mulloy 1958). This type of knife had a grooved bone or wooden handle placed on one side of the knife and opposite the blade notch. The haft was then lashed between the notch and the handle. The hafted handle was usually oblique to the longitudinal axis of the blade. Item 10 is a Yellowstone specimen of the distinctive Cody knife which dates from Early Prehistoric times (Wormington 1957). The reported distribution of the Cody knife runs from Colorado to Wyoming to Alberta. The

Figure 19



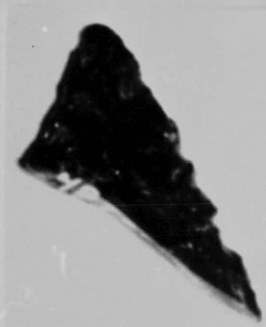
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Cody knife is usually regarded as an indicator of the Cody complex which includes Eden Valley and Scottsbluff type points (Wormington 1957).

Items 1 to 8 of Figure 20 are blades and knife butts. Item 4 has a trapezoidal cross-section as well as a trapezoidal form. Items 6 and 7 are probably end-hafted knives. Item 7 is suggestive of a Type L1 projectile point but is too fragmentary to warrant identification as such.

Items 9 to 15 of Figure 20, and 1 of Figure 21 are choppers and chopper pieces. In the main, these tools are crudely percussion flaked and exhibit few definitive characteristics. Item 12 was recovered in stratigraphic association with Intermountain pottery and a late Middle Prehistoric projectile point (the First Blood site).

Item 2 of Figure 21 appears to be a crude form of a spokeshave; that is, a tool with a sharpened notch used for scraping and trimming wood or bone shafts. The spokeshave serves a function similar to the shaft smoother illustrated as Item 7 of Figure 23. In the case of meticulous shaft makers, the smoother was probably used after the initial trimming of the shaft was done by the spokeshave.

Items 3, and 9 to 13 of Figure 21 are plane scrapers. The use of these scrapers indicates the dressing of animal hides. Item 13 is an unusually large form

Figure 20



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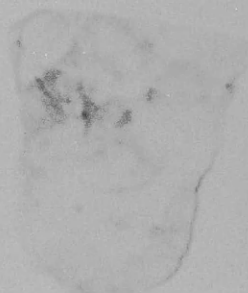
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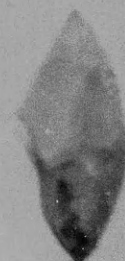
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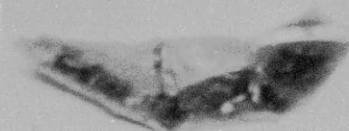
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Figure 21



1



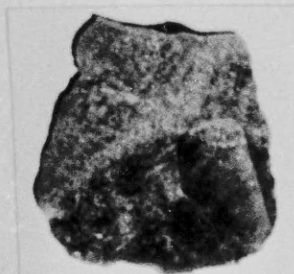
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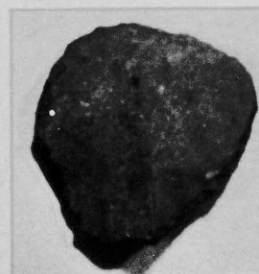
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13



14



15

projectile points full scale

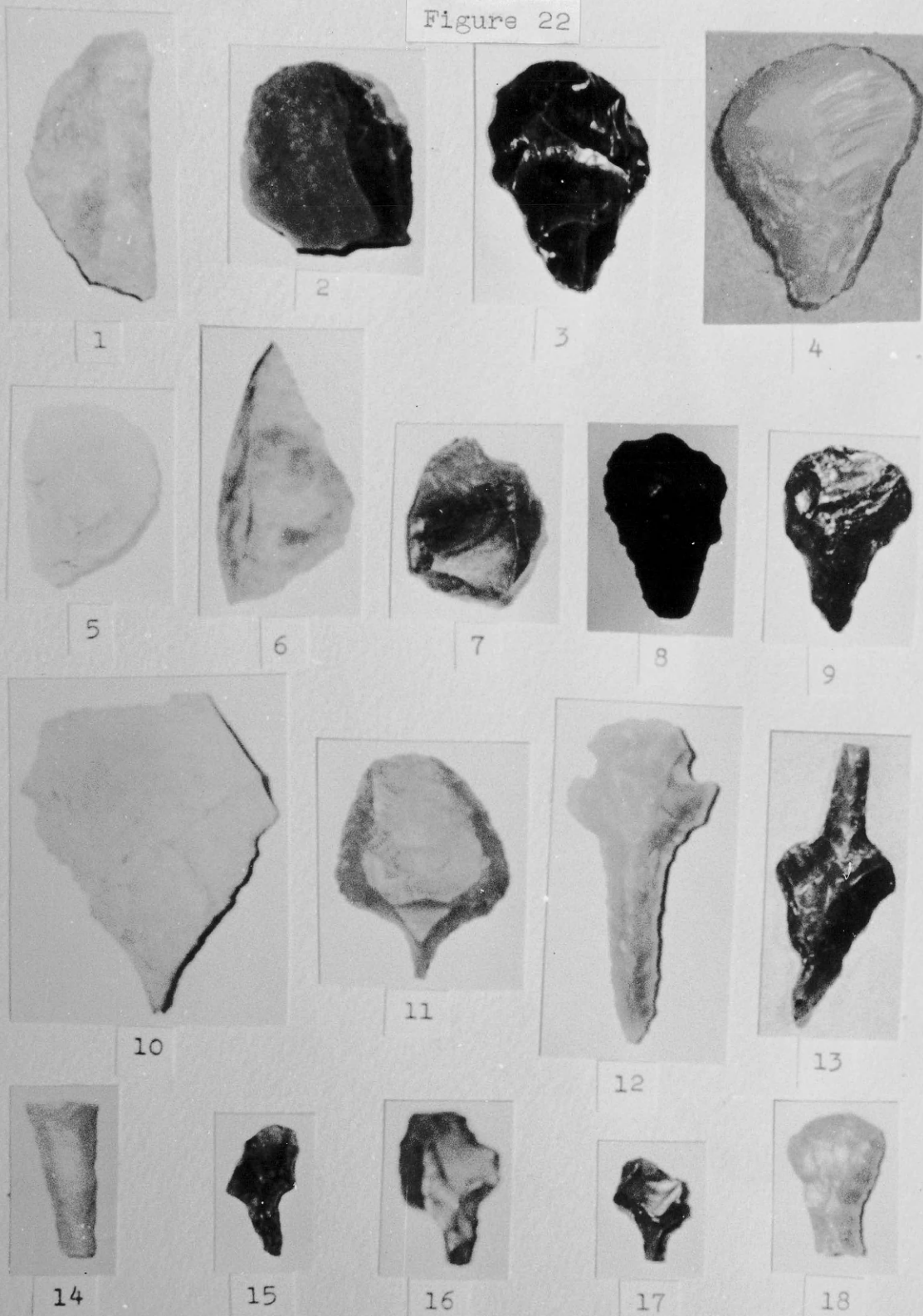
of plane scraper. It has a trapizoidal cross-section, symmetrical form and a level indentation (thumb grip?) pecked into its top face. The scraper is functional and shows smoothed marks of use on its bottom face at the widest point of the tool. While I know of no relationship for this size of scraper, I suggest that it may be a distinctive form.

Items 4 to 8 of Figure 21 are end scrapers. Their functional edges are generally restricted to one end of the tool. Item 4 is from the First Blood site. The size and form of Items 5 to 8 suggest that they were hafted.

Items 14 of Figure 21, and 2 to 7 of Figure 22 are plano-convex scrapers. Item 3 is percussion flaked and the others are pressure flaked. The use of these scrapers is undoubtably similar to the use of plane scrapers. Plano-convex scrapers and plane scrapers are probably stylistic variations of a single, unhafted scraper type.

Items 15 of Figure 21, and 1 of Figure 22 are side scrapers. The functional part of Item 1 is a straight edge while that of Item 15 is a parabolic edge. Side scrapers often appear similar to knives and blades. I suggest, however, that the tools can be distinguished on the basis of facial flaking. A side scraper is unifacially flaked, whereas, a knife or blade is bifacially flaked.

Figure 22



scrapers and perforators full scale

Figure 23



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2



3



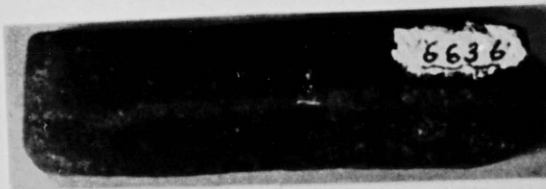
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miscellaneous tools full scale

Items 8 to 18 of Figure 22, and 1 to 6 of Figure 23 are perforating and graving tools. Items 10 and 11 are gravers probably used for incising bone and wood. Items 12 and 13 are drills that were probably hafted. Their form and size suggest that they were used for drilling rather dense materials. Items 15 to 18 do not appear to have been hafted. Items 1 to 6 of Figure 23 are unprepared flakes that show use as perforators. The bilateral edges of these tools have been nicked by use rather than deliberate flaking. The perforators are made of obsidian; a brittle material that will stand little stress or pressure. The edges of these tools are quite thin and I suggest that these tools were used for perforating soft materials such as prepared animal hides. If this suggestion is valid, perhaps we have the implication of prepared hides being joined for some purpose or rather in Yellowstone Park.

Items 8 of Figure 23, and 1 of Figure 24 are both from the same site, 48YE465, in northern Yellowstone Park. Item 8 is a smoothed rhyolite pebble that was probably used for abrading animal hides. It does not show any pecking marks on its ends nor does it show any evidence of having been used for grinding purposes. Item 1 is a granite milling stone -- the only such tool that the survey crew found in the Park. The illustrated surface of the stone is quite smooth and slightly indented.



1

milling stone full scale

OBSERVATIONS AND CONCLUSIONS

1.

The purpose of our survey and this manuscript is to present a preliminary appraisal of the archaeology of Yellowstone National Park. The means of the purpose have been carried out by a limited survey of the Park. The survey was limited by time available in the Park and, thus, was not as extensive as we would have liked. It cannot be denied that the surface evidence of the Park sites is sparse. But the data from many sites evaluated within a specific area can indicate the cultural and historical perspective of that area. This is the function of an archaeological survey.

The many sites of Yellowstone Park have given us a goodly amount of information in the form of artifacts as well as site locations. It is the analysis and evaluation of these factors that enable us to indicate something of the cultural prehistory of the Park. The primary means of evaluation is by means of establishing types and discovering the relationships of the recovered projectile points. Even the arbitrary system of classifying tools of a specific region by their forms is helpful -- almost necessary -- to the student of culture. When this system has been set up, it can be compared with similar systems set up for surrounding regions. The com-

parison of tool types suggests certain relationships that pertain to the lifeways of the tool makers.

We are fortunate to have precedents to draw upon for our appraisal of Yellowstone's prehistory. Foremost among these precedents are Pictograph Cave (Mulloy 1958) and the McKean site (Mulloy 1954). These two sites are located northeast and east, respectively, of the Park and in the same geographical and cultural area -- the Northwestern Plains. The temporal spans represented by these two sites vary. Pictograph Cave represents a time span from Early Prehistoric to Historic periods, whereas, the McKean site represents the Middle Prehistoric period. It is at the Middle Prehistoric period that the two sites tend to support each other's evidence. It is also at this time period that the two sites bear the most significant relationships to the cultural history of Yellowstone National Park.

Earlier in this manuscript we suggested that during Altithermal times the Yellowstone Plateau may have lacked the heavy timber stands that it has today. We further suggested that less timber on the Plateau would make for easier traveling and access of the Plateau. In addition, the altitude and geographical position of the Plateau suggest that it possessed more moisture than did adjacent areas during Altithermal times. By extension, we suggested that the Yellowstone Plateau

was easier and more desirable to live on than adjacent areas during Altithermal times. Just how valid are these suggestions?

First, let us attempt to describe the Altithermal period for the Yellowstone Plateau and Park. We previously noted that Altithermal times generally range from 7,000 years ago to 4,000 years ago for areas surrounding the Park (Antevs 1948; a later "Sub-Boreal" phase of 4,000 years ago to 2500 years ago is suggested by Van Royen, 1937, for the Central Plains southeast of the Park). This beginning date is probably somewhat early for the Park in view of the incomplete removal of the Yellowstone ice sheet by 10,000 years ago to 8,000 years ago (Alden 1928). Again, the altitude of the Plateau and its proximity to the High Rocky Mountains (specifically the Absaroka and Gallatin ranges) suggests a later Altithermal period and probably the reason for the incomplete ice removal by 10,000 years ago to 8,000 years ago. To my knowledge, there are no reports of attempts to correlate isolated Absaroka and Gallatin mountain-top glaciers with the final stages of the Wisconsin ice. In lieu of better information, I suggest that Yellowstone's Altithermal period began later and was milder than that of adjacent areas.

Whatever the actual time period of Yellowstone's

Altithermal period may have been, it approximates Middle Prehistoric times on the Northwestern Plains. Moreover, the culture of Middle Prehistoric peoples reflects the arid land conditions inflicted by the Altithermal climate. These people had a foraging economy; they were hunters and gatherers. Due to the aridity of the land, few game animals -- especially big game -- were available to Middle Prehistoric peoples. Although hunting was practiced, as evidenced by projectile points and butchering tools, it assumed a secondary importance in the economy of the foraging peoples. The collecting of wild plants foods such as seeds and roots became of prime importance to these people. This importance is best reflected in the numerous milling stones recovered from Middle Prehistoric sites such as Pictograph Cave levels I and II (Mulloy 1958), Signal Butte levels I and II (Strong 1935) and the McKean site upper and lower levels (Mulloy 1954). The numerous milling stones recovered from these sites indicates the ecological adaption of the foraging peoples towards a great dependence on plants.

A hunting and gathering economy does not tend to support very many people within a specific area. Observations of historic foraging peoples in the Great Basin of eighty years ago indicate that such people have small populations, consisting of small, nomadic bands constantly searching for sustenance. The obvious

implication here is that Middle Prehistoric peoples of the Northwestern Plains were also grouped into small, nomadic bands of little population.

From our typology and relationship of projectile points, we suggest that people of Middle Prehistoric times occupied Yellowstone Park. More than one-half of the identified projectile points recovered from the Park are suggested as being of Middle Prehistoric times. In line with our previous discussion on the Park's Altithermal climate, we suggest that game animals migrated into the Park during Altithermal times. As the areas adjacent to the Park slowly became more arid, the game animals gradually followed the lush lines of vegetation to higher altitudes and on to the broad plateau of Yellowstone Park. We don't know exactly when the foraging peoples outside of the Park became aware of the game animals at higher elevations. But the well developed projectile point styles suggest that it was sometime after the foraging peoples had become well adapted to the arid land outside of the Park. There is no evidence in the Park to support a sequential development of point styles from Early Prehistoric times. Nor is there any evidence that suggests that Middle Prehistoric peoples entered the Park at the same time as the game animals did. The entry of the foraging peoples was probably after 6,000 years ago and before 3500 years ago as

suggested by their well developed point styles.

The topography of the Plateau and the areal concentration of Park sites yielding the most Middle Prehistoric evidence suggests that the foraging peoples entered the Park mainly from the west. The apparent route of entry is over the northern edge of the Madison plateau to the Firehole river, thence, over the Central plateau to the Yellowstone river and south to the northern shores of Yellowstone lake (Figure 1). We are not sure what lines of travel were followed by the Middle Prehistoric peoples after they reached Yellowstone lake; probably the prominent streams and rivers. But travel they did, for sites yielding Middle Prehistoric evidence are recorded by the survey in the northern area of the Park along the Gardiner river and its tributaries as well as on the Southeast Arm of Yellowstone lake. The entry into the Park was probably a gradual, random movement of few people. The evidence does not indicate any great difference in population or movement between the early and late phases of the Middle Prehistoric period in the Park.

If our interpretations based on the relationships of projectile points and the areal concentration of sites are valid, then we have a good indication of Middle Prehistoric peoples in Yellowstone Park. Yet, something is missing -- the milling stones. As we previously noted,

milling stones are a characteristic, a cultural trait, of Middle Prehistoric peoples. Yet only one milling stone was recovered in the Park by the survey, and that from the northern area. If these people were truly gatherers as well as hunters, where are their milling stones?

It appears likely that the economy of Middle Prehistoric peoples that entered the Park underwent a significant change before they entered the Park. I suggest that the process of following game animals to the higher elevations was a gradual process involving relatively few people rather than a deliberate migration. I suggest that the game supply was sufficient for these people to depend upon. As the use of game increased, the dependence on plant foods decreased. It appears that the foraging peoples that entered the Park gradually discarded most of their techniques of plant food preparation and, thus, the tools required for these techniques. This implies an adaptation to a hunting economy that was well developed by the time the Middle Prehistoric peoples entered the Park. Many of the knives, scrapers and choppers that the survey found in the Park were recovered in surface association with projectile points of Middle Prehistoric times. I submit that the Middle Prehistoric period in Yellowstone Park is a unique problem in ecological adaptation for the Northwestern Plains.

2.

The occupation of Yellowstone Park apparently began before Middle Prehistoric times. Our evidence for Early Prehistoric times in the Park is quite sparse, consisting of twelve projectile points and one distinctive type of knife. Most of these artifacts are from sites along the southern shore of West Thumb bay, Yellowstone lake. Our present knowledge of Early Prehistoric peoples on the Northwestern Plains indicates that they were mainly hunters of big game. As big game hunters they probably spent most of their time on the open plains which, before the Altithermal, supported sizable herds of big game animals (Wormington 1957). There is no evidence to suggest a sequential development between Early and Middle Prehistoric times in the Park. I suggest that our evidence of Early Prehistoric times may represent a few hunters who, from time to time, wandered into the Park while following game. Our evidence does not indicate any great movement of peoples into, or within, the Park during Early Prehistoric times. The small amount of artifacts recovered and the concentration of these artifacts in a few, specific areas of the Park suggest that the Park population of Early Prehistoric times was very small and mobile. As we noted in the section on Typology and Relationships, the Early Prehistoric

period for the Park probably begins sometime after 10,000 years ago to 8,000 years ago and ends sometime before 3500 years ago.

3.

The Late Prehistoric period in the Park appears to be a reversal of the events that took place in Middle Prehistoric times. Elsewhere on the Northwestern Plains, the Late Prehistoric period is a time of growing population and ecological re-adaption based on hunting and a certain amount of horticulture. The open plains became more moist after the Altithermal period and were again capable of supporting large herds of game animals. Elk, deer, pronghorn and the modern bison were hunted by nomadic bands that slowly grew in population having gained a more bountiful food supply. The requirements of the late, big game hunters necessitated a large complement of tools for killing, butchering and hide dressing. Projectile points especially were more plentiful due to the use of the bow and arrow.

In view of the above situation, Late Prehistoric evidence in the Park is quite sparse. While we do have pottery, standing wickiups, tipi ring sites, one burial and a possible game compound, the evidence does not suggest any great amount of population in the Park during Late Prehistoric times. In addition, the number of

identified projectile points suggested as being of the Late Prehistoric period does not indicate an intensive amount of hunting within the Park during this period.. It is because of these factors that I suggest that the Late Prehistoric period was a reversal of Middle Prehistoric events. As the big game herds expanded on the open plains, it appears that people left the Park for the better hunting conditions of the open plains. In addition, the climactic change brought even more moisture to the Yellowstone Plateau. This resulted in the heavy winter snows of modern times and, probably, the gradual spread of the present-day heavy stands of timber. Under these conditions, I suggest that Yellowstone Park was less desirable for occupation than the open plains and the wide, lower-altitude mountain valleys of adjacent areas. Our evidence indicates that Late Prehistoric peoples did occupy the Park but perhaps on a seasonal basis and for the purpose of obtaining obsidian. The many chip strewn sites in the Park indicate that obsidian chipping was quite common and widespread..

It is possible that certain areas of the Park may have been occupied by Late Prehistoric peoples in winter-time. Thermal areas such as geysers, hot springs, mud holes and fumeroles in certain areas of the Park exhibit occupational evidence of Late Prehistoric times. Chip strewn sites located on thermal caps and in thermal

areas are found in the Norris geyser basin, Hayden valley, West Thumb of Yellowstone lake and in the Lower geyser basin (Figure 1). As we noted in the Introduction of this manuscript, one band of Historic Nez Perce apparently used thermal features for cooking purposes. While thermal areas are relatively snow-free during winter-time, we found no evidence to indicate that shelters had ever been built on sites in thermal areas. It is questionable that thermal areas (with the exception of those in or near the windswept Hayden valley) would support winter forage for game animals. At present, there is no accurate method of dating individual thermal features beyond Historic times. Moreover, thermal features can suddenly die out or erupt at any time depending, mainly, on the amount and placement of sub-surface water. This phenomenon was spectacularly demonstrated during the Yellowstone Earthquake of 1959. It is entirely possible that a thermal feature could erupt in a site after the site was occupied. I do not preclude the possibility of thermal area occupation during winter-time. I suggest that it is undesirable due to lack of game and the possibility of thermal eruption. I have no constructive evidence on this matter; it is still conjectural.

By 1690 A.D. to 1700 A.D. Indians on the Snake river south of the Park had horses. By 1730 A.D. horse

riders were on the middle Yellowstone river north of the Park and, except for timbered areas, in all areas of the Plains by 1770 A.D. (Haines 1938). The horse herds of the Plains Indian were not practical in the heavy timber of Yellowstone Park. Moreover, the big game herds roamed the open plains, not the Yellowstone Plateau. The horse and, later, firearms brought specialized techniques of hunting to the Plains Indian. While the northwestern and north-central areas of the Park were still used for cross-Park travel (Haines 1955, Howard and McGrath 1952), Yellowstone Park south of the Gardiner river appears to have been largely unknown to most Historic Indians.

4.

Obsidian Cliff is one of the more famous tourist attractions in Yellowstone Park. This geological curiosity is composed of vertical, obsidian columns projecting out of a small rift in the rhyolite overburden of the Yellowstone Plateau. Quite a bit of Park publicity has been devoted to Obsidian Cliff and its presumed use by prehistoric occupants of Yellowstone National Park. Displays at the Mammoth Museum at Mammoth Hot Springs, and a roadside exhibit at Obsidian Cliff illustrate the presumed prehistoric usage of the cliff by picturing Indians smashing blocks of obsidian with large rocks (see Replogle, 1956, p. 70, for a copy of this illustrat-

ion).

The Yellowstone survey did not record Obsidian Cliff as an archaeological site. While prehistoric people may have quarried Obsidian Cliff, we did not find any evidence suggestive of this. It is rumored that stone hammers have been found on Obsidian Cliff. We attempted to track down these rumors and found that no one in the Park seemed to know what the hammers look like, who picked them up, or where the hammers are at present.

The top of Obsidian Cliff exhibits obvious marks of quarrying operations. Obsidian has been knocked out of the rhyolite matrix and the ground area is thick with spallings and chips. The bottom face of the Cliff also shows many marks of quarrying. While the collapse of a column from time to time accounts for a certain amount of chips, much of the chipping is the result of human agencies. My observations of curious tourists at Obsidian Cliff suggest that it is a rare person who doesn't pick up or knock off a few chips. Projecting this suggestion over ninety years and several million tourists, the extensive quarrying marks on Obsidian Cliff lose archaeological significance. Many of the quarrying marks are due to sampling by U.S.G.S. geologists (Clarke 1896, 1900; Hague 1887, 1899; Iddings 1885) who probably took many samples from random areas

of the Cliff.

I suggest that Obsidian Cliff may not have been as extensively quarried by prehistoric peoples as generally belived, simply because it was not necessary. Obsidian in glacial pebble form is literally underfoot in many areas of the Park; especially in the northwestern area near Obsidian Cliff. Such pebbles are certainly easier to obtain and work than large blocks of obsidian. I suggest that glacial obsidian pebbles constituted the major source of obsidian used by prehistoric peoples in the Park.

5.

A comparison of the general chronology proposed by Mulloy (1958) for the Northwestern Plains as a whole, with the general chronology that I propose for Yellowstone National Park reads as:

| NORTHWESTERN PLAINS | YELLOWSTONE PARK |
|--|---|
| HISTORIC PERIOD (generally) 1800 A.D. | 1870 A.D. |
| LATE PREHISTORIC PERIOD 1500 years ago to 1800 A.D. | 1,000 years ago to 1870 A.D. |
| MIDDLE PREHISTORIC PERIOD 6500-3500 to 1500 years ago | before 3500 to 1,000 years ago |
| EARLY PREHISTORIC PERIOD 13,000 (minimum) to 6,000 years ago | after 8,000 to be- fore 3500 years ago |

SUMMARY

Four definite periods of aboriginal occupation are found in Yellowstone National Park. These four periods are viewed as both cultural and temporal periods. The first period, Early Prehistoric, began after 10,000 to 8,000 years ago and extended to some 3500 years ago. Early Prehistoric peoples in Yellowstone Park were few in number and apparent wanderers from adjacent plains and broad, mountain valley areas.

The second period, Middle Prehistoric, is a unique problem in ecological adaption for the Northwestern Plains. Elsewhere on the Northwestern Plains, Middle Prehistoric peoples are characterized by their tools used in the techniques of plant food preparation. Such characteristic tools are not associated with Middle Prehistoric peoples in Yellowstone Park. These people adapted to a hunting economy before entering the Park and apparently discarded most of their techniques for plant food preparation. The population of this period probably consisted of small, nomadic bands; the people being more numerous and less transitory than in the previous period. Towards the end of the Middle Prehistoric period, people drifted out of the Park and into the open plains and broad, mountain valley areas. The suggested dates for the Middle Prehistoric period in Yellowstone Park are from about 3500

years ago to about 1,000 years ago.

Late Prehistoric, the third period of aboriginal occupation in the Park, is marked by sparse population. Occupation of the Park during this period was probably seasonal and for the purpose of obtaining obsidian. Conjecturally, some Late Prehistoric peoples may be descendants of Middle Prehistoric peoples. The suggested dates for the Late Prehistoric period in the Park are from about 1,000 years ago to 1870 A.D.

The fourth period, Historic, begins at 1870 A.D. and still continues. The beginning of this period is marked by the use of the northern area of the Park as an east-west passage by the Nez Perce, Crow and, possibly, Bannock. The use of northern Yellowstone Park as an east-west passage actually began in Late Prehistoric times (before 1870 A.D.) by peoples who are considered Historic (horse-using Nez Perce and Crow) in areas outside of the Park. The Yellowstone Park area south of the Gardiner river appears to have been largely unknown to Historic Indians except certain bands of Tukuarika.

The first three periods of aboriginal occupation are conceptualized by a relationship of projectile point styles. Elsewhere on the Northwestern Plains, the lifeways of the peoples of these three periods are more or less distinct. It is doubtful that distinct lifeways can be ascribed to Yellowstone Park. The peoples of the

first three periods in the Park apparently were all hunters. The basis for distinguishing the first three periods is the relationship of projectile point styles to areas outside of the Park. The Historic period for the Park is conceptualized from ethnographic data as no Historic aboriginal sites were found in the Park. The lifeway of Yellowstone occupants for the beginning of the Historic period was probably the same as in the end of the Late Prehistoric period.

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