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CANYON AND VALLEY
PRELIMINARY ARCHAEOLOGICAL SURVEY
IN THE GALLATIN AREA, MONTANA

By

Lewis Kyle Napton

B. S. Montana State College, 1959

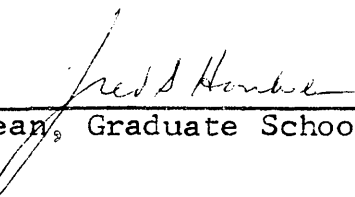
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Master of Arts

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1966

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The author offers this summary of his initial effort in the field of archaeology in nostalgic affection for the memory of October afternoons at the first dig with the finest of field crews--his parents--to whom this paper is dedicated.

Lewis Kyle Napton

University of Montana, Missoula
September, 1965

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	iii
LIST OF FIGURES	ix
LIST OF TABLES	x
LIST OF PLATES	xi
INTRODUCTION	xii
Survey Project	xiii
Survey Report	xiv
 Chapter	
I. MONTANA ENVIRONMENT AND CULTURAL GEOGRAPHY	1
General Description	1
Flora	2
Fauna	4
Climate	4
Montana Cultural Geography	5
II. THE ARCHAEOLOGY OF MONTANA AND ADJACENT REGIONS.	7
Plateau	7
The Montana Western Region	11
Plains	16
The Northwestern Plains Region	17
Desert-Great Basin	21
The Montana Southwestern Sub-Region.	23
Cultural Chronology	25
Paleo-Indian Period	28
Early Period	30
Middle Period	32
Late Period	35
Historic Period	37

TABLE OF CONTENTS

Chapter	Page
III. THE GALLATIN AREA.	39
Area Concept	39
General Description.	40
The Gallatin Valley.	41
Physiography	41
Phsiography and Occupation	42
Ecology.	44
Climate.	44
Soils.	45
Water Systems.	48
The Gallatin Canyon.	48
Physiography	48
Ecology.	50
Climate.	50
Soils.	50
Water Systems.	51
IV. OCCUPATION OF THE GALLATIN AREA.	52
Prehistoric Occupation	52
Historic Occupation: Caucasian.	53
The Gallatin Valley.	53
The Gallatin Canyon.	57
V. THE ARCHAEOLOGY OF THE GALLATIN AREA: INTRODUCTION TO THE DESCRIPTION OF THE SITES	58
Field Procedure.	58
Archaeological Sites: Nomenclature.	61
Archaeological Sites: Function Categories	65
Archaeological Sites: Comparative Occurence	66
Archaeological Sites: Chronological Ordering	66
Description of Sites: Procedure	68

TABLE OF CONTENTS

Chapter		Page
VI.	THE ARCHAEOLOGY OF THE GALLATIN AREA: DESCRIPTION OF THE SITES	76
	Introduction	76
	Gallatin Valley Sites.	76
	Gallatin Canyon.	115
	The Upper Gallatin Canyon.	135
	Madison Drainage	145
	Yellowstone Drainage	181
VII.	THE ARCHAEOLOGY OF THE GALLATIN AREA: DESCRIPTION: OF MATERIALS AND ARTIFACTS	208
	Materials.	208
	Description of Lithic Materials.	208
	Lithology.	211
	Distribution of Lithic Materials	213
	Reliability of Random Collection of Flake Samples.	214
	Discussion of Lithic Material.	216
	Artifacts.	220
	Artifact Classification.	220
	Typology	223
	Projectile Points.	224
	Implements	250
VIII.	THE ARCHAEOLOGY OF THE GALLATIN AREA: GENERAL DISCUSSION	269
	Culture.	269
	Technology	269
	Ideology	270
	Sociology.	271
	Implications	272
	Ecological Zone Variant.	280
	Valley	280
	Canyon	281

TABLE OF CONTENTS

Chapter	Page
Lifeways in the Canyon and Valley	283
Valley.	283
Canyon.	287
IX. PREHISTORIC POPULATION IN THE GALLATIN AREA . .	291
Introduction.	291
Comparison of Environment	292
Archaeological Evidence	302
Direct Ethnographic Approach.	311
Population Estimates.	315
X. CONCLUDING SUMMARY.	320
LITERATURE CITED	328

LIST OF FIGURES

Figure	Page
1. Map 1. Montana and the Gallatin Area.	3
2. Map 2. Montana Archaeological Regions and Traditions Influences.	6
3. Map 3. Culture Areas in America	12
4. Map 4. Montana: Archaeological Sites	27
5. Culture Periods.	29
6. Map 5. Gallatin: Political	38
7. Map 6. Gallatin: Schematic Topography.	43
8. Map 7. Gallatin: Topographic Thoroughfares	46
9. Map 8. Gallatin: Archaeological Sites.	75
10. 24 GA 301: Pictographs.	80
11. 24 GA 310: Projectile Points.	89
12. 24 GA 310: Manual Scraper	90
13. 24 GA 312, 313: Artifacts	96
14. Map 9. 24 GA 314: Aerial View.	98
15. 24 GA 314: Test Pit I, Profile.	103
16. 24 GA 314: Projectile Points.	106
17. Map 10. 24 GA 314: Stone Circles	108
18. 24 GA 315, 316: Projectile Points	114
19. 24 GA 312: Oblique Sketch View, Site Area	116
20. 24 GA 317: Projectile Points.	122

LIST OF FIGURES

Figure	Page
21. 24 GA 317: Implements	125
22. 24 GA 318, 319, 321, 323: Projectile Points . . .	130
23. 24 GA 322: Artifacts.	134
24. 24 GA 326: Artifacts.	147
25. 24 GA 326: Implements	148
26. Various Sites: Ground Stone Implements.	151
27. 24 MA 301, 302: Projectile Points, Pottery. . . .	159
28. 24 MA 305: Artifacts (Austin Collection).	171
29. 24 MA 305: Artifacts (Austin Collection).	173
30. 24 MA 305: Pictographs, Site Cross-Section. . . .	174
31. Map 11. 24 JF 402: Stone Alignment	178
32. 24 JF 403: Pictograph Motif #1.	180
33. 24 JF 401, 24 PA 321: Artifacts	185
34. 24 PA 323: Pictograph Motif #1.	189
35. 24 PA 323: Pictograph Motif #3.	190
36. 24 PA 324: Artifacts.	197
37. 24 PA 326: Pictographs.	205
38. Gallatin Area Sites: Artifacts.	207
39. Map 12. Gallatin: Projectile Points.	267
40. Map 13. Gallatin: Projectile Points.	268
41. Biome Zonation in the Survey Area.	284
42. Population Curve, Survey Area.	317

LIST OF TABLES

Table	Page
1. Culture Sequence in the Gallatin Area.	31
2. Climatological Data: 1957; 1964	47
3. Archaeological Sites: Function Categories	69
4. Archaeological Sites: Comparative Occurrence.	71
5. Archaeological Sites: Chronological Ordering.	72
6. Archaeological Sites: Tabulation.	73
7. Madison Flatbottom Ware: Attributes	155
8. Madison Flatbottom Ware: Metrical Data.	157
9. Lithic Material: Distribution	215
10. Reliability of Random Collection of Lithic Flake Samples.	217
11. Lithic Material: Modification	304
12. Archaeological Sites: Population Density.	310
13. Aboriginal Population Density, Montana	321

LIST OF PLATES

Photograph	Page
PLATE I.	
1. 24 GA 311: Kinsey Collection Projectile Points; Photograph: C. A. Kinsey.	93
2. 24 GA 314: Madison Bison Drive.	93
PLATE II.	
3. 24 GA 325: Snowflake Pole Lodge	139
4. 24 YE 301: Wickiup Creek Pole Lodge, Structure Two, 1958.	139
PLATE III.	
5. 24 MA 301: Madison Flatbottom Ware Ceramic Vessel	160
PLATE IV.	
6. 24 PA 308: Emigrant Bison Drive, in 1949. . .	200
7. 24 PA 308: Emigrant Bison Drive, South Drive Line, in 1951.	200
PLATE V.	
8. 24 PA 325: Eagle Creek, Test Pit I, Stratigraphy and Feature 7; Firehearth . .	203

INTRODUCTION

The history of organized archaeological research in Montana, the fourth largest state, spans less than three decades. Much has been accomplished in this brief time; however, before the complex prehistory of Montana will be adequately known, the archaeology of several localities must be systematically investigated.

The following report describes preliminary archaeological survey in the geographically important "Gallatin area." Located in southwestern Montana, the Gallatin area is a mountainous territory contiguous to the Yellowstone National Park plateau in Wyoming, the Snake River plain in Idaho, and the Missouri River valley in Montana. East of the Gallatin area is the valley of the Yellowstone River; to the west is the Continental Divide and the Pacific slope of the Rocky Mountains. The Gallatin River, one of the parent streams of the Missouri, rises in this area, near the watershed of the Snake River. The latter is a principal tributary of the Columbia. Thus, the Gallatin area is situated in an important geographical location (Figure 2).

The primary purpose of the survey project was to discover, record, and evaluate a sample of the archaeological

remains. The Gallatin area is located in juxtaposition to several discrete physiographic and cultural regions (e.g., the Northwestern Plains and the Columbia Plateau). The survey data was evaluated in order to test the hypothesis that the archaeological remains found in the Gallatin area would indicate complex intermingling of a variety of cultural traits derived from certain "Plains" and "Plateau" cultures. (These terms are used here in their liberal, descriptive connotations.)

A secondary object of the survey evolved during preparation of this report, when it became evident that there were certain differences between the archaeological remains found in the Gallatin Valley and the Gallatin Canyon (Figure 7). An attempt was made to assess the significance of the apparent differences (Cf. Chapter X).

Survey Project: The Gallatin River drainage, Gallatin County, Montana, and portions of adjacent localities were collectively designated as a conceptual archaeological area. (Cf. Chapter III.) Field investigations began in 1948 and continued over a span of ten years. Members of the field party recorded more than 150 archaeological sites and collected several hundred lithic specimens. The survey area was some three thousand square miles in extent, however, only a small amount of this territory was thoroughly

investigated. Large privately-owned portions of the Gallatin Valley are under cultivation: these potentially important localities could not be examined in detail. Only a single day was devoted to reconnaissance in the isolated northeast corner of Gallatin County; and the high, rather inaccessible mountain ranges along either side of the Gallatin Canyon were not thoroughly explored. It is axiomatic that no individual or field party is capable of discovering all of the archaeological remains in any locality. The author's efforts in the Gallatin area certainly will prove to be no exception--additional survey in the area is necessary. Testing and excavation of several of the recorded sites will be the object of the author's future endeavors in this area.

Survey Report: There were at least two methods of reporting the results of the archaeological survey of the Gallatin area: the first entailed publication of a massive compendium of site-survey reports, detailed site descriptions, artifact illustrations, and other basic data. An alternative method required preparation of a report describing a portion or sample of the sites and archaeological material. The author's financial circumstances dictated his choice of the latter option: this study describes a representative sample of forty-five sites and approximately 150 artifacts. This basic data provides a framework for tentative reconstruction of prehistoric culture in the canyon and valley.

CHAPTER I

MONTANA ENVIRONMENT AND CULTURAL GEOGRAPHY

General Description: The State of Montana averages 550 miles in east-west length, and 275 miles in width (Figure 1). The state includes portions of two major physiographic divisions; the Rocky Mountains and the Northwestern Plains. Granite Peak, 12,799 feet, is the highest point in the state; the lowest point, 1,820 feet, is found on the Kootenai River at the Montana-Idaho border. The Continental Divide traverses north and south across the width of the state. Most of the western third of the state has greater geographical and ecological affinity with northern Idaho than with eastern Montana. The intermontane valleys in western Montana have an elevation of 4,000 to 5,000 feet and average fifteen miles in width and fifty to seventy miles in length. The principal rivers of western Montana are the Clark Fork, Flathead, Bitterroot, and Kootenai; all are tributaries of the Columbia River.

Two-thirds of Montana lies east of the Continental Divide. Most of this region is a great undulating grassland which slopes east into the Great Plains. Extensive erosion of the land surface has left isolated sandstone plateaus separated by broad valleys of deeply bedded alluvium. The

Missouri River drains the northern portion of this region; the Yellowstone River the southern portion.

The Gallatin River, one of three major rivers which form the Missouri, is located east of the Continental Divide in southwestern Montana, a region of high mountain ranges similar to those found in western Montana. These mountain ranges shelter broad valleys which are ecologically comparable to the plains of eastern Montana.

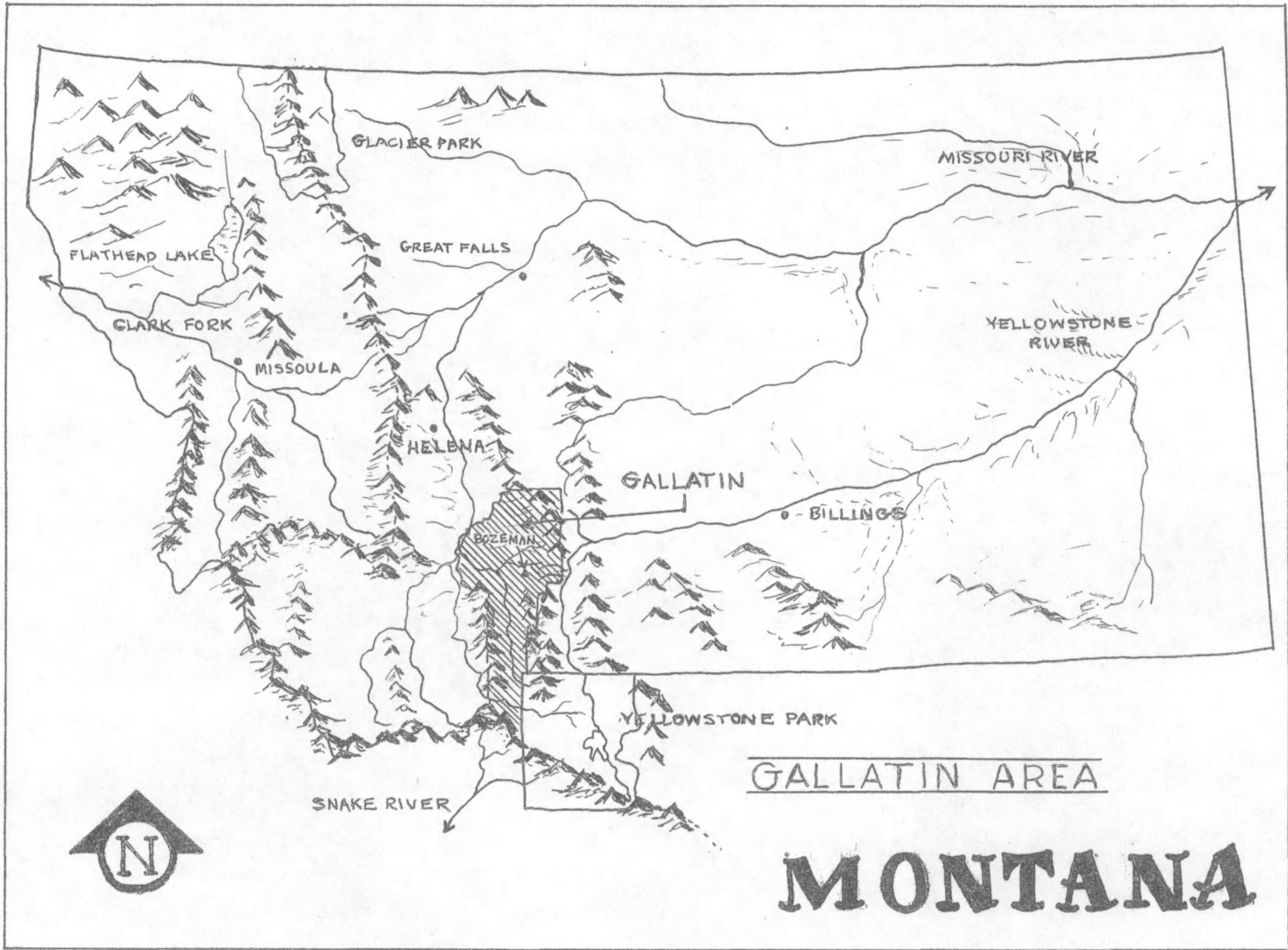
Flora: The geographic dichotomy of Montana is reflected in the native vegetation, as Booth (1950: 3) observes:

[The] plants of Montana are represented in three distinct topographic groupings. West of the Continental Divide we find many kinds that are characteristic of the Pacific Coast. The mountainous regions, especially east of the divide, exhibit typical Rocky Mountain species, while the northern Great Plains of eastern Montana has its particular plants. These major subdivisions are in turn subdivided into hundreds of kinds of habitats . . . which have resulted from extremes in moisture, altitude, slope, temperature, soil types, and other environmental factors.

Coniferous forest dominates the western and southwestern regions of the state; the intermontane valleys are covered by luxuriant, deeply-rooted grasses. On the plains east of the divide grow short grasses such as Blue grama (Bouteloua gracilis), grammas (Bouteloua, sp.), and buffalo grass (Buchloe dactyloides).

More than 2,000 species of wild flowers and non-flowering plants are found in Montana (Montana Almanac,

FIGURE I



1958). These are grouped in three classes: alpine, montane, and plains (Figure 41). Some of the alpine species are glacier lilies, Indian paint brush, violets, and laurel. The montane group, found on the lower mountain slopes and foothills, includes various shrubs--e.g., kinnikinnick, which the Indians used as tobacco. Crocus and daisies are among the flora of the plains group. The bulbs of Bitterroot and Camas, which grow west of the Continental Divide, were roasted and eaten by the Indians. Chokecherries, buffalo berries, and other vegetal foods growing east of the divide were an important part of the Indian diet. A summary of the edible plants of Wyoming and Montana is found in Mulloy (1958: 20-1).

Fauna: The various biomes and plant associations support different kinds of animal populations. There are ninety species of mammals in Montana. Some of the larger game animals in western Montana are deer, elk, bear, and moose. The plains grassland of eastern Montana is the habitat of running or burrowing animals such as gophers, badgers, and prairie dogs. Grazing herbivora include bison and pronghorn antelope.

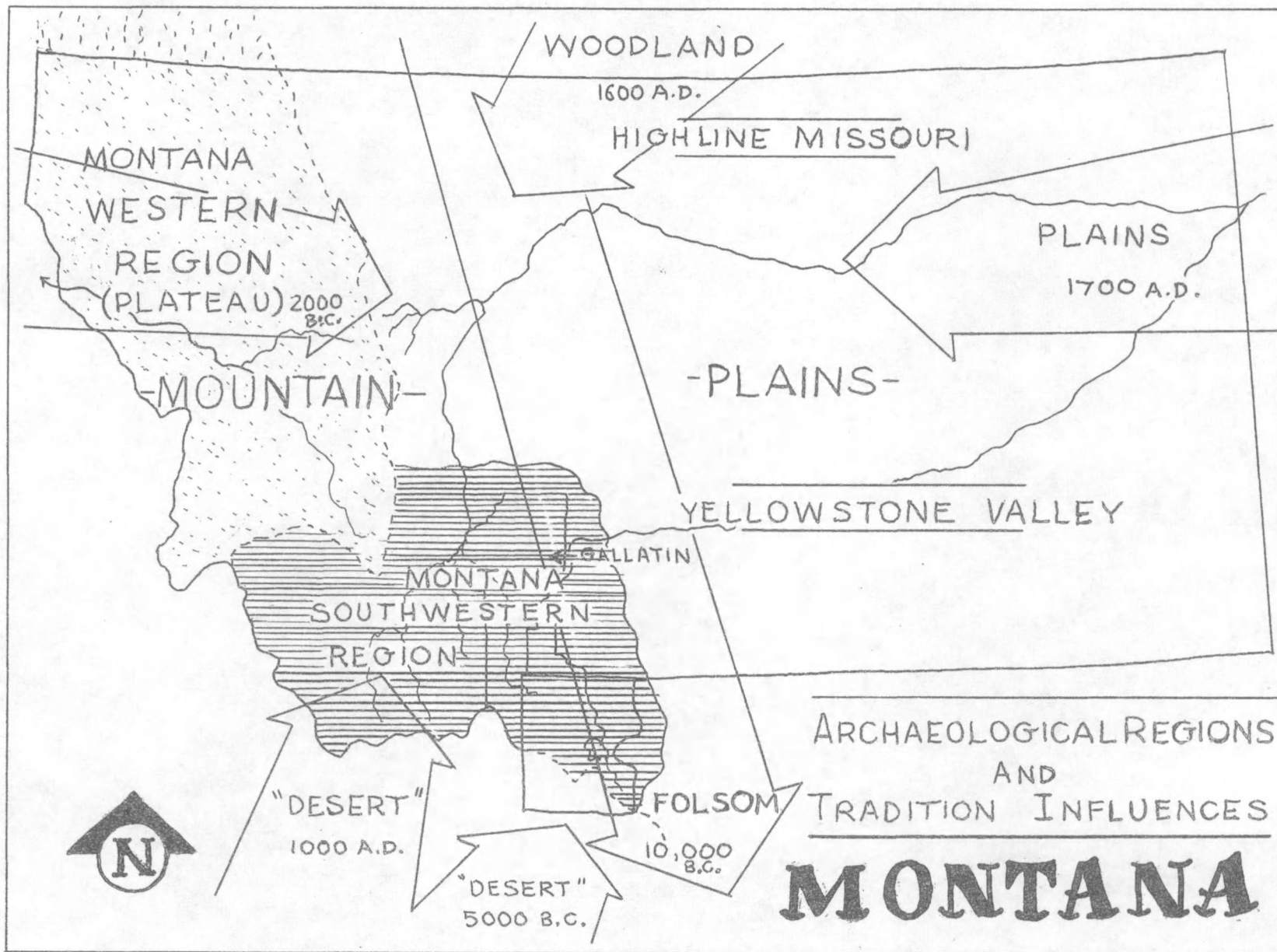
Approximately 300 species of birds live in Montana. Sixty species of fish, most of which are edible, are found in the waters of the state (Montana Almanac, 1958).

Climate: Montana's climate is as varied and extreme

as its topography. The summer days are usually sunny and warm, but the nights are quite cool. Daytime temperatures vary from an average of 84.5 degrees in July to twenty-eight degrees in January. Snow falls intermittently from mid-November to late May. The average annual precipitation throughout the state is fifteen inches, but this amount varies from a minimum of 9.69 inches in portions of eastern Montana to a maximum of more than 100 inches on the slopes of some of the mountain ranges in western Montana (Cf. Table 2).

Montana Cultural Geography: The physiography and climate of Montana has produced two distinctive environments, and the archaeological remains found in the state evidently reflect this dichotomy. Sites and artifacts found east of the Continental Divide relate, in general, to an economy centered on the hunting of bison; the remains found west of the divide indicate a diversified hunting and gathering economy. Archaeologically, and perhaps culturally, Montana is included in two much larger territories; the Montana Western Region, and the Northwestern Plains Region (Figure 2).

FIGURE 2-



CHAPTER II

THE ARCHAEOLOGY OF MONTANA AND ADJACENT REGIONS

The relationships of the archaeological remains found in the Gallatin area may be indicated by reviewing some of the traits of three cultural traditions which may have impinged on both the Montana Western and Northwestern Plains Regions. These are traits of the "Plateau, Plains, and Desert" traditions.

Plateau: The plateau of the Pacific Northwest is a physiographic entity defined along its northern extremity by the Canadian coniferous forest, to the west by the shore of the Pacific Ocean, on the south by the inland deserts, and to the east by the Rocky Mountain cordillera of Idaho and Montana (Figure 3). This geographic area corresponds to the "Plateau culture area" (Daugherty 1962: 144).

Several Plateau sub-cultures or cultural traditions have recently been described by regional archaeologists. According to Swanson (1962a: 151):

Three basic early cultures have been defined, with one potential culture as yet undefined. These are: (1) Old Cordilleran culture, (2) Mountain-Plains culture, and (3) Bitterroot culture, which may have been antecedent to the Desert culture.

Daugherty (1962: 149) grouped some of the previously

defined cultures of western America as follows (Cf. Figure 3):

Distinctive areal patterns began to develop with the onset of the Thermal Maximum period which ultimately made it possible to identify the Southwest, Plateau, and Great Basin culture areas of the Late period. These patterns are . . . regarded as areal cultural traditions within the Intermontane Western tradition, and are termed the Southwest Area tradition, the Northwest Riverine Area tradition, and the Desert Area tradition [which is] what Jennings and Norbeck have . . . termed the Desert culture.

Accordingly, Swanson's "three basic early cultures" apparently could be considered "area traditions" within the "Intermontane Western tradition." Regarding the first of the three cultures listed by Swanson, B. Robert Butler (1964) stated the following:

The history and development of the Old Cordilleran culture theory shows that it is clearly a hypothetico-deductive model intended to predict rather than to summarize what is known about the earlier prehistory of the Northwest, which would be more typical of an inductive-empirical theory.

Several regional archaeologists have posited theoretical models in order to place various archaeological manifestations in cultural context. They first postulate--then demonstrate--cultures, however, this manipulation would seem to be at odds with a view that Albert Spaulding (1958: 15) has expressed as follows:

It is true that any assemblage represents a segment of a continuous stream of cultural traditions extending back into time . . . [the time stream] should be classified in terms of events which are themselves associated with a cluster of other new events so as to yield a succession of distinct culture types.

The point that the present author intends to underline is that the use of two quite different approaches ("empirical" and "conceptual") has resulted in the postulation of (1) "theoretical" cultures having indefinite spatio-temporal dimensions, and (2) cultures having explicitly defined characteristics occurring within a finite time span and within demonstrable spatial confines (Cf. MacWhite 1956: 3-25). It is evident that the philosophical or methodological dichotomy is fundamental; the ramifications of this problem in American archaeological theory have yet to be appreciated.

Swanson (1962b: 153-5) discusses the Mountain-Plains, Bitterroot, and Old Cordilleran cultures as follows:

The Rocky Mountain region north of the Salmon River and west of the Continental Divide can be regarded as part of the same environment which characterizes the Cascade Range. This would be the first important natural setting for Early Man in the Pacific Northwest.

◊ ◊

The second important natural setting is that associated with the Rocky Mountain Range south and east of the Salmon River in Idaho. This region may also include the Rocky Mountain trench in western Montana, occupied in the southern end by Flathead Lake. Here the mountain valleys are open, grading into parkland forest with open meadows. Wild animals, salmon, steelhead, and trout are abundant; and camas is an important plant in the high meadows of the area. On the other hand, berries seem to be rather less abundant. The earliest people to occupy the region might be referred to as members of a Mountain-Plains culture. They were followed very rapidly by a second early group which will be referred to as the Bitterroot culture. The older of the two is characterized by an association with both fossil and modern mammals,

while the later culture is characterized by the presence of modern fauna. In this respect the Bitterroot culture is comparable to the Old Cordilleran culture. (p. 153)

. . . there may be a Mountain-Plains culture. For deductive, hypothetical purposes, I would view this culture as adapted to parkland forests . . . and adjacent grassy plains which intergrade with the mountain valleys and which form part of the natural setting. (p. 154)

The Mountain-Plains culture was succeeded by, and overlaps with, the beginnings of the Bitterroot culture . . . characterized by . . . side-notched points. . . . The Bitterroot culture is the archaeological counterpart of the Northern Shoshoni. This could be the antecedent to a series of Desert cultures. (p. 155)

The Old Cordilleran culture . . . artifact complex includes the Cascade leaf point, oval and leaf-shaped knives, and possibly edge-ground cobbles. (p. 155).

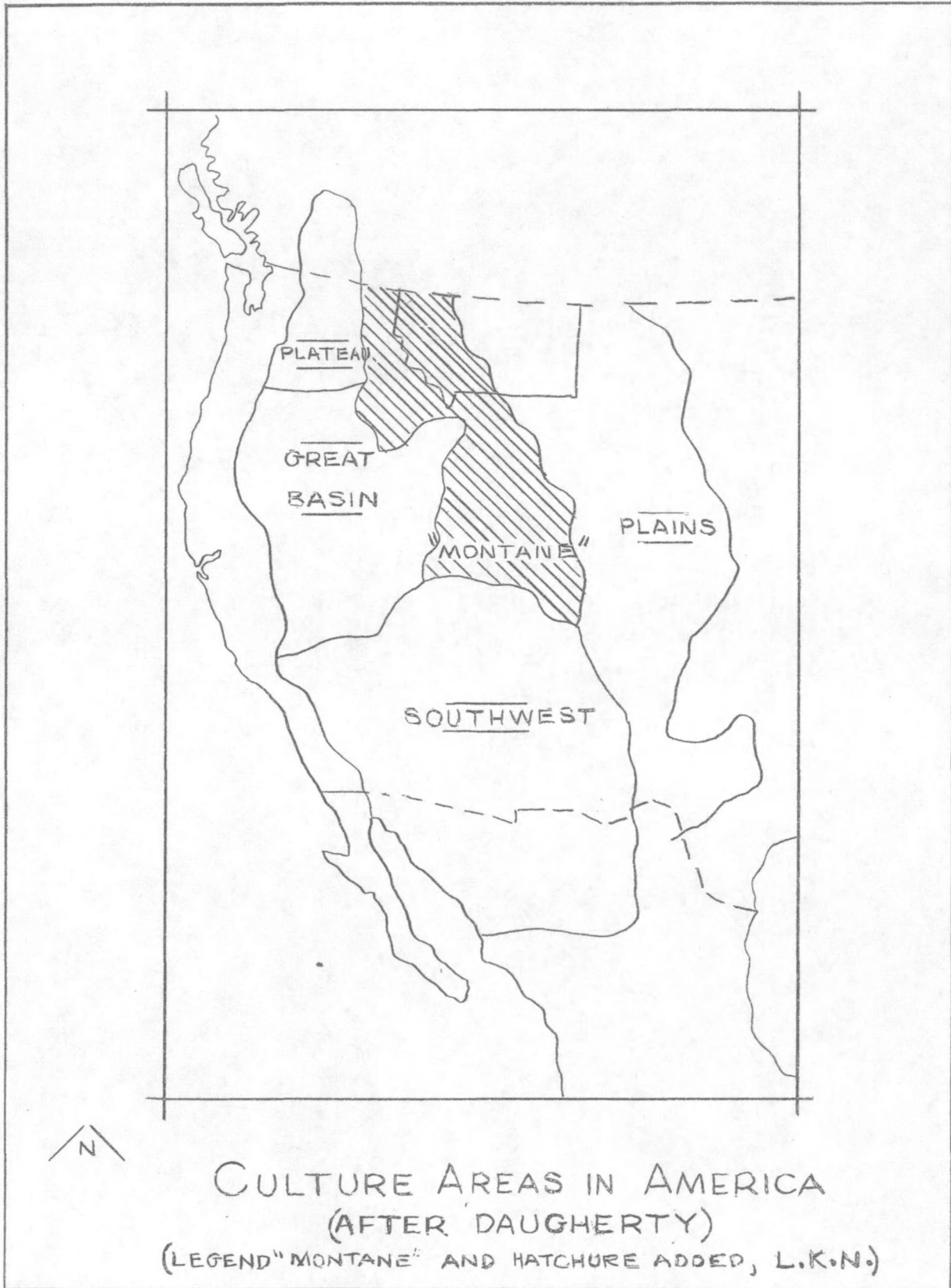
Artifacts similar to those of the Plateau cultures were either manufactured in the Plateau region and traded or transported into Montana, or were manufactured locally by native inhabitants who had been influenced by Plateau culture traits. "Plateau" artifacts found in Montana include edge-ground cobbles, said to be associated with Cascade projectile points in the nebulous "Old Cordilleran Culture" (Butler 1964). Edge-ground cobbles have been reported found in central Montana (Lewis 1944: 336); near Red Lodge in south-central Montana (Mulloy 1943: 176); and in the Gallatin area (Arthur, personal communication, 1964). In 1955, the author found edged cobbles in the Montana Western Region (Napton 1964b). Cascade projectile

points have been reported found in Yellowstone National Park (Taylor 1964: 105-6), and in the Montana Southwestern Sub-Region (Figure 33).

Some archaeological verification of the dispersal of Plateau traits into Montana is evident in the distribution of hand mauls (Griswold 1953: 12). These implements are said to be numerous in the valley of the Columbia River, but evidently are not common in eastern Montana. A few have been found on the surface of occupation sites located in the central and western portions of eastern Montana, and a single specimen was found in Yellowstone National Park, Wyoming (Taylor 1964: 156, Fig. 31:A).

A partial list of "Plateau" artifacts found in Montana includes knives made of argillite, sea-shell ornaments, serrated-edge corner-notched projectile points made of basalt, digging stick handles made of deer antler, elk antler wedges, and tubular copper "beads" or ornaments (Collier 1942: 102).

The Montana Western Region: Malouf (1956: 45) has defined this region as an "archaeological territory" which encompasses all of western Montana and portions of Idaho, including Lake Pend d' Orielle. Limited on the east and south by the Continental Divide and the Bitterroot Mountains, the northern portion of the region extends an undetermined distance into British Columbia.



- FIGURE 3 -

Some of the distinctive traits of the Montana Western Region are conical pestles; long, incised pestles or cylindrical objects; scarcity or absence of tipi rings; Type One pictographs; extensive use of basalt and quartzite artifacts; and persistence of corner-notched projectile points (Malouf, personal communication, January 1965). Several projectile points found in various locations in the Montana Western Region collectively suggest that man occupied the upland portions of the region for a considerable length of time. Approximately two dozen specimens that resemble Scottsbluff, Agate Basin, Cascade, and McKean projectile points have been found by several individuals, including the author. Almost all of these points were found on the surface of occupation sites in spatial association with corner-notched and side-notched projectile points. At this writing, discrete "Early Man" occupation sites have not been reported found in the Montana Western Region.

The culture of the inhabitants of the Montana Western Region was based on an economy centered on the hunting of various fauna and the extensive gathering of roots and vegetables. Fish were obtained from rivers to the west; bison were hunted on the plains to the east.

Several localities in the region may not have been intensively occupied. The paucity of archaeological material in the valley of the Bitterroot River and in the

valley of the south fork of the Flathead River (Griswold 1953: 37) suggests that these areas were infrequently occupied. Most of the high mountain ranges in the Montana Western Region were not permanently occupied, but served as "hunting areas" (Kroeber 1939: 201).

At least ninety percent of the archaeological sites found in the Montana Western Region are associated with permanent watercourses, springs, or lakes. The shores of Flathead Lake, for example, seem to have been intensively occupied. Griswold (1953: 47-8) reports finding occupation sites, rock shelters, and pictograph panels. Archaeological specimens included

numerous . . . chips . . . projectile points (51%),
scrapers (20%), knives (18%), grooved mauls, hand
mauls, and long objects of pestle-like form (6%),
drills or punches (4%), and miscellaneous (1%).

According to Griswold, drills were present in the material culture of but one site, where they were evidently associated with triangular shaped side-notched projectile points. Drills are rare in the Montana Western Region, but awls have been found (Napton 1964b). Most of the west shore of Flathead Lake is a dry grassland microenvironment that was suitable for bison: the material culture of several sites includes triangular side-notched projectile points, drills, grooved mauls, tipi rings, and other traits elsewhere associated with bison hunting. However, as Griswold (1953: 47) points out, "the small number of sites . . . and

relatively few artifacts reported . . . justify no more than tentative observations."

Fragmentary faunal remains (species unidentified at this writing) have been found in the upper strata of two sites located in the extreme southeast portion of the Montana Western Region, and more than forty "tipi rings" have been found on a total of nine different sites (Napton 1964b). Bison drives have not been reported found, although Forbis (1960: 65) mentions that bison drives "are said to occur in the Intermontane basins of Western Montana."

The first archaeological investigations in the Montana Western region include Elrod's description of the extensive pictograph panels found near Dayton, Montana (Elrod 1908: 3-8) and H. H. Turney-High's excavation of two burials found west of Missoula (1937: 17-21). Recently many publications by Carling Malouf; the Flathead Lake investigations (Griswold 1953); the Hellgate Survey (Griswold and Larom 1954); and the Summit Survey (Napton 1964b), have contributed to the archaeological knowledge of the region.

The archaeological remains found in the Montana Western Region display, in general, prehistoric Plateau culture influences and minor, relatively recent influences from the Plains cultures (Figure 4).

Plains: Eastern Montana is a peripheral portion of the plains region of the American midwest. The Great Plains are defined on the west by the Rocky Mountain cordillera, to the east approximately by the line of twenty-inch average rainfall, on the north by the Canadian border, and to the south by an arbitrary line traversing west-central Texas.

Man's occupation of the Great Plains began long before the extinction of the Pleistocene megafauna. Fluted percussion-flaked Clovis projectile points are found in some of the oldest sites located on the plains. These points were associated with mammoth remains in kill sites dated by radiocarbon as being more than 11,000 years old. Clovis points were evidently superceded by fluted pressure-flaked Folsom points, frequently found among the bones of extinct forms of bison in sites averaging 8,000 to 10,000 years old. About 6000 B.C., hunters of modern bison made distinctive parallel-flaked Eden and Scottsbluff projectile points.

The Indians who lived during the period between 5000 and 2500 B.C. have been called the "Foragers." According to Malouf (1960: 9), the Foragers subsisted on plant foods, seeds, roots, and small game. Bison hunting increased during the subsequent periods.

Pottery is present in the material culture of Plains archaeological sites that were occupied during the Sedentary Horizon (Lehmer 1954: 141). This period or horizon spans

the transition from food gathering to incipient food production. The Plains-village economic pattern, based on horticulture, formed the lifeway of essentially sedentary Indians who lived in villages of earth-covered lodges. Bison hunting continued, and, during the Proto-historic and Historic Periods, when most of the Indians acquired horses, many formerly semi-sedentary tribes became nomadic bison hunters--a lifeway that many of these tribes probably never completely abandoned. The culture of the tipi-dwelling equestrian tribes such as the Crow, Atsina, Sarsi, Dakota, Cheyenne, and Assiniboin is summarized by Wedel (1961: 242) as follows:

Plains tribes all were nomadic in the sense they could move readily from place to place without loss of homes or other belongings. All possessed horses, made frequent or exclusive use of the skin tipi, the travois, the parfleche, and were skilled in skin working. During the spring, summer and fall they ranged widely over the plains, transporting themselves and their baggage by horse and dog, sustaining themselves on the flesh of the bison and drying large quantities of meat for winter use. Hunting practices included cooperative devices such as the surround, the pound, and the use of falls or "jumps." With the approach of cold weather they retired to the protection of wooded valley bottoms, or to broken hills, or mountainous localities where shelter, wood, water, and forage for their horses were available. Since agriculture was absent, pottery-making of negligible importance, and residence changed frequently, there is little or nothing at their former campsites from which the archaeologist can hope to learn very much about the people.

The Northwestern Plains Region: Eastern Montana lies entirely within the Northwestern Plains (Wedel 1961: 23, Fig. 1). Prehistoric occupation in this region seems

to have been intensive, as well as extensive. Archaeological sites seem to be at least ten times more numerous on the Northwestern Plains than in the Montana Western Region. Intensive occupation was probably sustained by the large food supply provided by great herds of bison.

The Missouri River plain near Great Falls (Schumate 1950), and the valley of the Milk River, near Havre, Montana, seem to have been intensively occupied, an impression perhaps generated by the fact that the archaeological remains found in these localities have been more thoroughly studied than have the remains found in other portions of this part of Montana (Cf. Davis 1965: 4-9). Among the archaeological manifestations found on the Northwestern Plains are stratified occupation sites, rock shelters, bison drives, tipi rings, medicine wheels, rock alignments, stone forts, log lodges, and pole lodges (Cf. Mulloy 1958: 204-23). Occupation sites are usually located on river terraces or near spring outlets; however, many sites are far removed from existing sources of water.

The Riverdale Site, located in the valley of the Sun River, near Great Falls, may represent the most ancient occupation of Montana (Figure 4). The site was revealed (and destroyed) during operation of a sand and gravel pit. A few of the artifacts found by Kenneth Strickland in the gravel screened from the site were reported upon by Taylor (1960: 11-4), who identified two of the projectile points

as Clovis points.

In 1952, Richard Forbis excavated the important MacHaffie Site, located a dozen miles east of the Continental Divide. The site demonstrates an artifact sequence extending from Folsom through Scottsbluff to the recent "Helena" component. Clovis, Folsom, Scottsbluff, and Angostura projectile points are early types which have been found east of the Continental Divide (Mulloy and Lewis 1943: 298-9). McKean projectile points (Mulloy 1954: 432-60) are much more numerous on the Northwestern Plains than they are in the Montana Western Region.

Some of the recent artifacts commonly found on the Northwestern Plains are small triangular "un-notched" projectile points, small side-notched base-notched projectile points, straight base side-notched projectile points, bison scapula digging tools, grooved mauls, small plano-convex scrapers, ovoid knives, small sandstone discs, and various types of pottery. (Cf. Mulloy 1958: 151-2, for detailed trait lists.)

Ceramic traditions entered Montana from the northeast and southeast a few centuries prior to Caucasian contact. Wedel (1951: 130-8) believes that some of the pottery found in Montana represents a cultural thrust which emanated from the Great Lakes region. Ceramic material is distributed as far west as the Continental Divide (Schumate 1950), but none has been found in the Montana Western Region.

River Basin Surveys crews tested sites located along the Marias River and found potsherds that are said to represent one of the oldest ceramic traditions in Montana (Wendorf 1962: 45).

A variety of pottery known as "Ethridge ware" has been found on the surface of occupation sites located north and east of Great Falls, Montana, in the drainages of the Sun and Missouri Rivers. Ethridge ware is related to "Pisamik" pottery (Kehoe 1959: 237-46) of Woodland origin, but the former variety evidently has been subject to considerable local modification. Massive rock cairns and mounds constructed of earth, which are found in northern Montana, are probably associated with the Woodland cultural tradition.

Early work in the archaeological sites on the Northwestern Plains in Montana includes the excavation of Pictograph and Ghost Caves near Billings (Mulloy 1958); the Red Lodge Site (Mulloy 1943); and the Hagen Site, a Mandan-Hidatsa ceramic site (Mulloy 1942). Bison drive deposits were excavated by H. P. Lewis (n.d.), Barnum Brown (1932), and Maynard Schumate (1950). Research in the region is presently being carried forward by members of the Billings and Milk River archaeological societies, Smithsonian River Basin Surveys crews, and the staff and students of the University of Montana anthropology department.

Desert-Great Basin: Elements of the "Desert Culture" (Jennings and Norbeck 1955: 2) may have entered Montana from the south. Jennings (1956: 70) is of the opinion that

there are local environmental specializations of the Desert Culture, including littoral adaptations on the Pacific Coast . . . and lakeshore communities in the Great Basin.

According to Jennings and Norbeck (1955: 2), the Desert Culture dates to at least 11,000 years ago, and forms a cultural continuum, rather than a cultural horizon or brief culture "period." Longevity of desert aridity in Nevada and Utah, and the persistence and stability of the culture (e.g., in Danger Cave; Jennings 1957) seem reasonably evident.

Jennings (1956: 70) compiled a list of Desert Culture by traits. Only two imperishable traits seem not to be shared by Northwestern Plains cultures. These are Desert Culture trait number 2: "caves and overhangs favored for settlement," and trait number 18: "flat milling stones with cobble mano." It is interesting that in Montana, milling stones were found in Pictograph Cave, a large cave or "overhang." Perhaps, as Wedel (1961: 254-5) has suggested

it may be . . . following termination of the Altithermal, repopulation of the Montana-Wyoming region was accomplished in considerable part by Desert Culture immigrants.

Unfortunately, there are few rock shelters, caves, or overhangs in Montana; the only occupied cave reported found in southwestern Montana is the Point of Rocks Cave,

located near the town of Whitehall. Milling implements were not found in this cave, however, approximately 150 miles to the south at Wilson Butte Cave, Idaho, Gruhn (1961: 128) found "the cultural affiliations of the Level III assemblage . . . lie clearly to the south, in the Great Basin area." Moreover, she compares the Wilson Butte Dietrich Phase artifacts (1961: 135) with those found in Pictograph Cave Levels III and IV:

Similarities of the Wilson Butte Cave material to that from sites in the Great Plains indicate that the relationships between the two areas were close over a long period of time.

Elements of the Desert cultural tradition may have been carried as far north as the Canadian border (Teit 1930: 305). This possibility has been questioned, as Mulloy informed Wedel (1961: 243):

There is still considerable disagreement among scholars whether or to what extent [the Shoshone] may once have occupied a substantial area of the Plains in Montana and Alberta before the Blackfeet established their domination over the region.

Ethnographic evidence indicates that the Shoshone may have occupied the Eagle Hills in Saskatchewan as early as 1680 (Malouf, personal communication, October 1964).

The only artifacts found in the survey area that suggest Desert Culture influence are the milling stones from 24 GA 326 and 304 (Figure 26), and the flatbottom pottery found at site 24 MA 301 (Plate III). Flatbottom, or "Intermountain" pottery occurs throughout the Desert

culture region, viz., the Great Basin. "Intermountain Flatbottom ware" is a rubric used to describe several varieties of generally similar types of pottery. Typical flatbottom ware is extremely thick, usually basal-flanged, hand-modeled earthenware pottery having very coarse constituents (Figure 27). Manufacture of flatbottom pottery has been attributed--on the basis of ethnographic and circumstantial archaeological evidence--to the Shoshonean tribes of the Great Basin (Mulloy 1958: 199). Widely distributed in Wyoming and Idaho, flatbottom pottery has recently been reported found in Yellowstone National Park (Taylor 1964: 70-3). Flatbottom pottery is a definite, albeit "late" Desert Culture trait (Cf: The Desert West, Bennyhoff, 1958), regardless of whether or not its production and use was limited exclusively to the Shoshone.

Recent excavations in the Birch Creek valley, Idaho, (Swanson et.al. 1964) may be of value in demonstrating the introduction, duration, and intensity of Desert Culture influence in northwestern Idaho and adjoining portions of southwestern Montana.

The Montana Southwestern Sub-Region: The entire two-thirds of Montana located east of the Continental Divide is usually regarded as an increment of the Northwestern Plains (Figure 2). Nevertheless, the physiography of the southwestern portion of this region is significantly different.

The region is set apart from the Plains by a massive series of mountain ranges which shelter the broad intermontane valleys of the Gallatin, Beaverhead, Paradise, Helena, Big Hole, Shields, and Madison Rivers. This mountainous region may have been continuously occupied, although in varying degrees of intensity, for a considerable length of time, for as Kroeber (1939: 188) states:

The Northern Rocky Mountain Province . . . was a genuine home, although not a densely settled one, for a number of tribes . . . the reason is the several large intermountain valleys which it includes.

Mulloy (1958: 15) defined the general physiographic region as follows:

North and east of Yellowstone National Park lies the Northern Rocky Mountain system. The continuity . . . of the mountain landscape is broken by occasional wide valleys with nearly flat or hilly floors 2,000 to 5,000 feet below the crests. The width of such valleys may be ten miles or more and their length much greater . . .

This physiographic entity also constitutes a discrete "archaeological territory" (Malouf 1956: 45). Explicit definition of the Montana Southwestern Sub-Region entails taxonomic problems which clearly exceed the scope of the present study. The region is characterized by a variety of distinctive cultural traits, among the more significant of which are triangular side-notched obsidian and ignimbrite projectile points found in the deposits of bison drives (Plate I); basally-ground corner-notched basalt and chert projectile points found on a series of small,

montane-forest occupation sites; milling implements; Clovis, Cascade, Hellgap, Agate Basin, and McKean projectile points; flatbottom pottery; tipi rings; stone circles; human effigy rock alignments; and pole and log lodges.

The archaeological remains found in the Montana Southwestern Sub-Region include traits of the Plateau, Plains-Woodland, and Desert cultural traditions. The nature and intensity of cultural influence varied, of course, from occasional interregional exchange of trade items to seasonal occupation of the region by transient hunters who were culturally affiliated with these traditions. During the Christian era elements of these cultural traditions became increasingly complex, widespread, and diagnostic. The possible chronological development of this trend is discussed in the following section.

Cultural Chronology: The sites, artifacts, culture and population in the Gallatin area will be considered in terms of a postulated chronological sequence. The author has temporarily discarded a proposed set of local "phases" worked out by seriation of "geographically and temporally contiguous components" (Butler 1962: 12-3). Perforce, he recognizes five "Periods" of human occupation. These are (from the earliest to the latest) the Paleo-Indian, Early, Middle, Late, and Historic periods. Comparable cultural periods have been postulated by Malouf, Taylor, Mulloy,

Forbis, and Wedel, among others. These periods are graphically represented in Figure 5. There is an encouraging degree of correspondence in the length of the postulated temporal intervals diagrammed in Figure 5. Included for comparison are the Birch Creek phases (Swanson 1964: 116), and a series of culture periods defined by Butler (1959) on the basis of investigations at The Dalles, Oregon.

Discussion of the archaeological remains found in the Gallatin area will be based on a cultural chronology diagrammed in Table 1. The five lateral columns in Table 1 consist of the following provisional terminology:

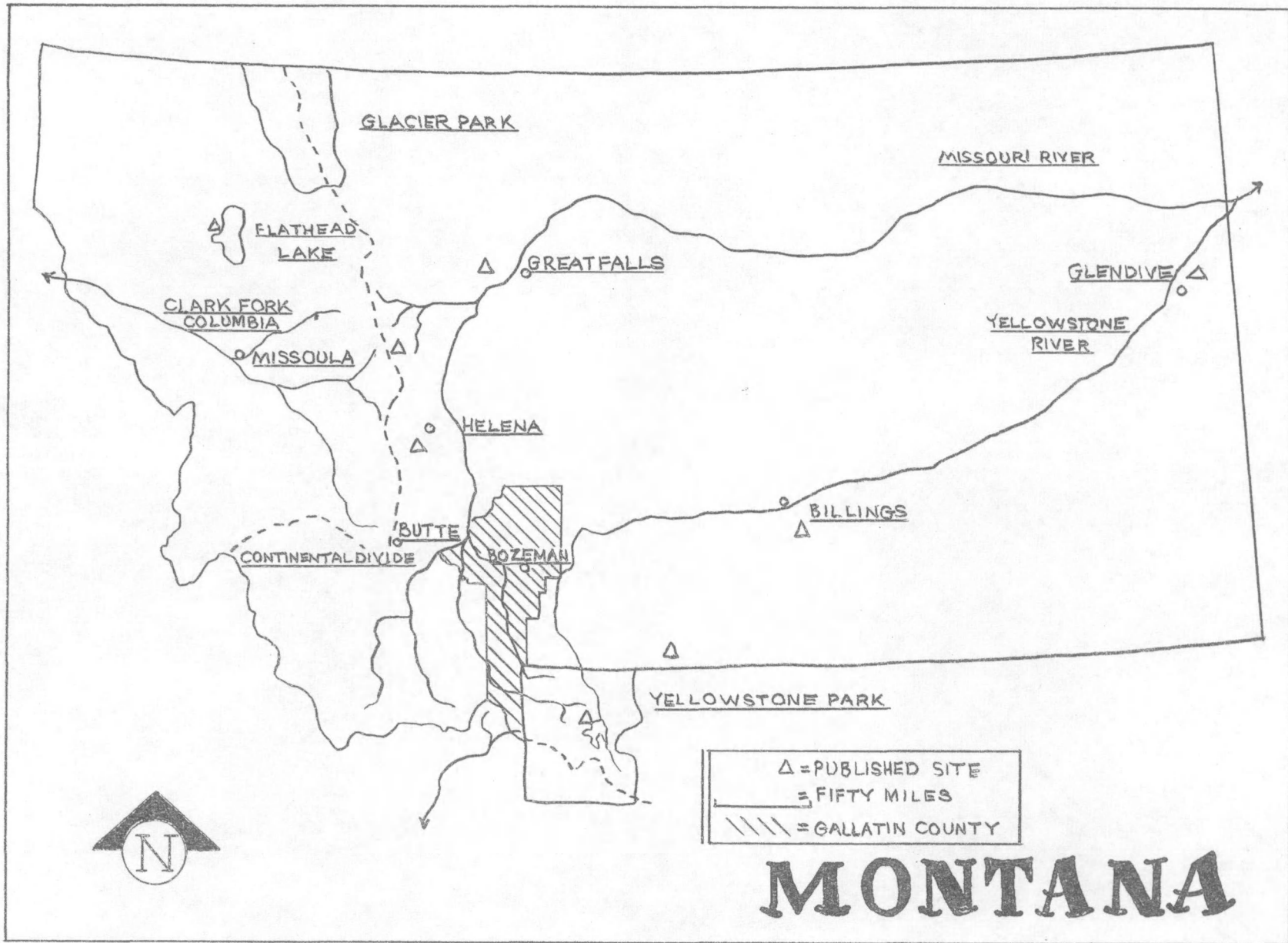
Column 1: Culture periods applicable in Montana and the surrounding regions.

Column 2: A "Culture-name" suggesting the economic basis and possible social organization of the culture.

Column 3: The suggested temporal duration of each period listed in column 1.

Column 4: The gross general projectile point types which might have been prevalent in the survey area during each culture period; the terms "Fluted" and "Parallel-flaked" are in general use. The author has suggested the descriptive term "side-ground" as a generic designation for several varieties of projectile points, such as Agate Basin and related types. Several types of corner-notched projectile points (and at least one type of side-notched point not described in this study) exhibit marked basal

-FIGURE 4-

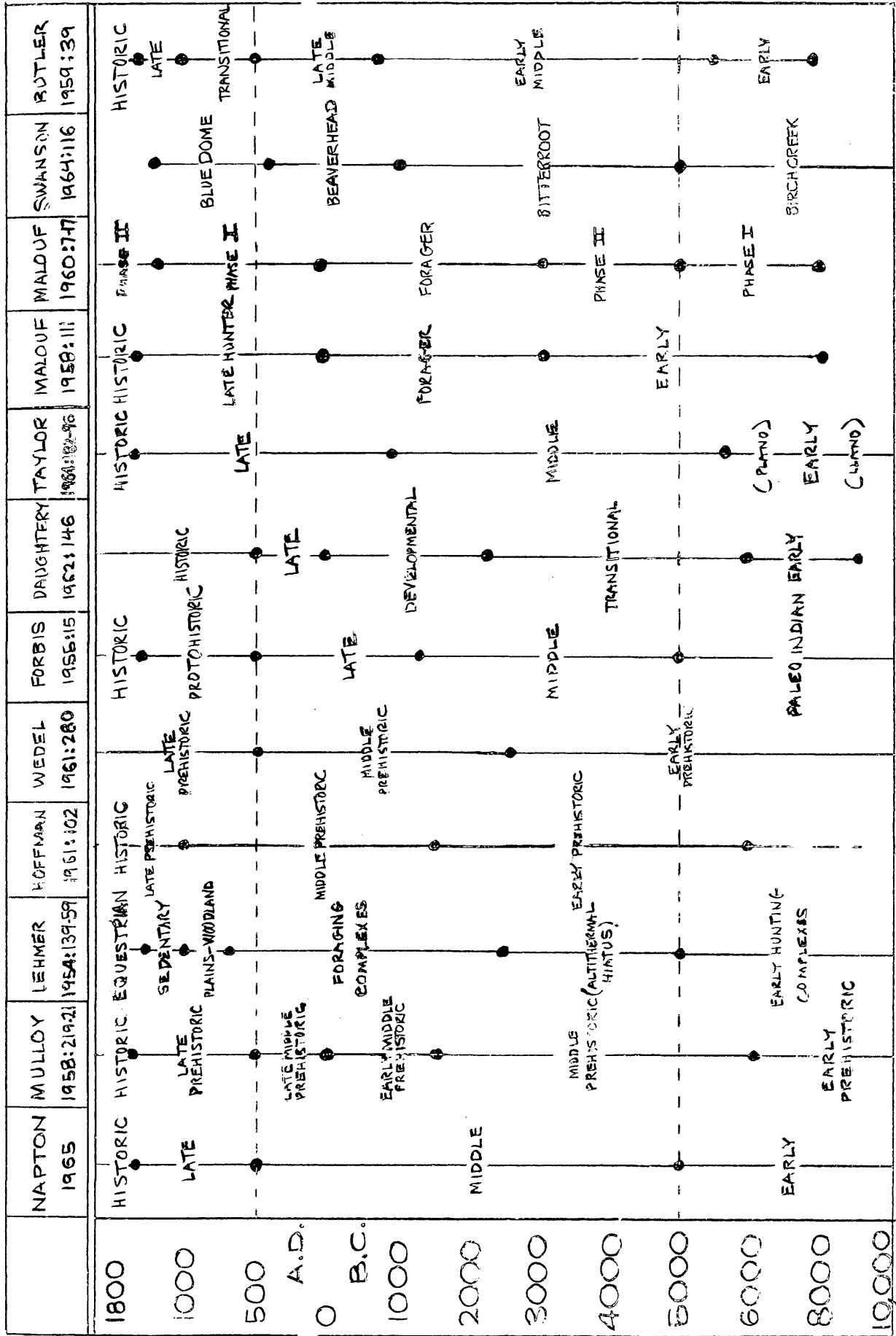


grinding; however, only the sides of Agate Basin, Hell Gap and comparable projectile points are ground. "Stemmed" projectile points, a similar generic grouping, includes several named varieties; e.g., McKean, Thunder Creek, and Hanna.

Column 5: Some of the named projectile points and weapon types of the various culture periods.

A major problem encountered in formulating a regional cultural sequence is that some authorities have used the same terms in reference to two discrete concepts--historical, and chronological development. While Mason and Irwin (1960: 55) would classify "Eden, Scottsbluff, Plainview, and Angostura" projectile points as "paleo-Indian," the author consigns these assemblages to the "Early Hunter" period. Some of the criteria used to identify the respective culture periods are outlined below. The important diagnostics of each period are summarized in papers written by Malouf (1960: 2-20), Wedel (1961: 280), and Mulloy (1958: 204-22).

Paleo-Indian Period: (Exceeding 10,000 years B.C.)
Archaeological remains representing a "pre-projectile point" stage have not been reported found in the survey area, nor has such evidence been found anywhere in Montana. The only "lower-lithic" (Willey and Phillips 1958: 82) manifestation reported found near Montana is the "Black's



CULTURE PERIODS

Fork Culture" located in southwestern Wyoming (Renaud 1938, 1940). Contemporary authorities are of the opinion that this "culture" is a chimera.

Among the diagnostic traits of the Paleo-Indian "lithic stage" (Willey and Phillips 1958: 91) are Sandia projectile points, first found by Hibben (1941) in New Mexico. Sandia points apparently have a very limited distribution: they have not been reported found in Montana; however, according to Marie Wormington (1957: 91), Sandia points have been found in Alberta, Canada.

Early Period: (10000 B.C. to 5000 B.C.) During the Early Period, according to Mulloy (1958: 208),

a basic pattern of small, nomadic groups of primitive hunters and gatherers was already set. . . . the groups are small, suggesting small numbers [of inhabitants] or short occupation or both. Evidence of dwellings is lacking, suggesting highly perishable shelters of hides or brush.

The Early Period is characterized by the distinctive fluted Clovis and Folsom projectile points (Wormington 1957: 21-47), representing the so-called "Llano" and "Lindenmeier" cultures. Clovis points have not been found in stratified context in Montana, except in the destroyed Riverdale Site (Taylor 1964: 11-4). Fragmentary Folsom points were found at the MacHaffie Site (Forbis and Sperry 1952: 127). Jasmann (1963: 11) has described several fluted points found in an area closely approximating the Montana Southwestern Sub-Region (Figure 34). Few of these

TABLE 1: CULTURE SEQUENCE IN THE GALLATIN AREA

1 Period	2 Organiza- tion	3 Temporal Duration	4 Projectile Point Tradition	5 Point Name
Historic	"Mounted Hunters"		(Metal)	(Firearms) Metal Points
Late	"Communal Hunters"	A.D. 1800	Side- Notched Corner- Notched	<u>Gallatin</u> Continental <u>Limestone Butte</u> Emigrant
Middle	"Foraging Hunters"	A.D. 500	Stemmed Side- Ground	<u>Hanna</u> McKean <u>Carbella</u> Agate Basin
Early	"Early Hunters"	5000 B.C.	Parallel- Flaked Fluted	<u>Scottsbluff</u> Eden <u>Folsom</u> Clovis
Paleo	[]	-10000 B.C.	[Shouldered]	[Sandia] ? — ?

specimens were associated with other cultural material. The majority were found on stream terraces, hills, or similar elevated areas located adjacent to river floodplains. It seems probable that the ecological setting of the Early Period in the Gallatin area might have been generally similar to contemporary conditions. A Clovis projectile point found on the Reese Creek site (24 GA 304) is now in possession of a local landowner.

The latter portion of the Early Period, circa 7000 B.C. to 5000 B.C., is characterized by the presence of parallel-flaked Eden and Scottsbluff projectile points comprising the "Cody Complex," manifested in Colorado and Wyoming (Wormington 1957: 118-37). Willey and Phillips (1958: 106) attribute these projectile points to the "Early Archaic" stage, which other writers have called the "Proto-archaic" stage. Scottsbluff projectile points were found in an intermediate level of the MacHaffie Site (Forbis and Sperry 1952: 129-30). Eden and Scottsbluff points may eventually be found in the mountain canyons of the Gallatin survey area. (Cf. Figure 22, S-116-1)

Middle Period: (5000 B.C. to A.D. 500) The latter portion of the Early Period and the onset of the Middle Period is spanned by the widespread occurrence of "side-ground" projectile points. These lanceolate-shaped projectile points--frequently made of obsidian, basalt, or

ignimbrite--have a wide spatial distribution in the mountains of the Montana Southwestern Sub-Region (Figure 39). Their temporal position remains in some doubt, pending location and excavation of suitable stratified sites. Side-ground points probably date between 5000 B.C. and 3500 B.C.

"Cascade" projectile points (Butler 1961) may be among the early "plateau" artifacts found in the Montana Southwestern Sub-Region.

In the southern portion of the Northwestern Plains, the Middle Period is recognized by the occurrence of "stemmed" points and various types of grinding implements which were almost certainly used in the preparation of vegetal food. These artifacts manifest an "archaic" stage or level of development (Willey and Phillips 1958: 108). Root-roasting pits found in Middle Period sites imply "increased vegetable gathering orientation" (Mulloy 1958: 209). McKean projectile points came into use on the Northwestern Plains between 3000 B.C. and 1000 B.C. Mulloy (1954: 444) suggests that

all variants [of the projectile points found at the McKean Site, Wyoming] appear so closely connected by intergrades that the writer prefers to regard them as variants of a single norm.

McKean projectile points evidently occur in a "continuous range of shapes" (Mulloy 1954: 445), ranging from deeply indented-base McKean points through the Duncan projectile point type (Wedel 1961: 251) and the Hanna type

(Wheeler 1954: 7-14) to various stemmed or "shallow corner-notched" types found in the Gallatin Survey area. One of the stemmed projectile point types found in the Bighorn Canyon, Montana, has been named "Pryor Stemmed" (Hustad, personal communication, May 1965).

A deeply indented-base McKean point was found on site 24 GA 313 (Figure 13). Milling stones were found at 24 GA 304 and 309 in the Gallatin valley, and at 24 GA 326 in the extreme periphery of the survey area (Figure 25). Whether these artifacts represent the Forager Culture remains to be determined. The Forager lifeway is both a "stage" in cultural development and a response to certain local environmental conditions, *i.e.*, aridity, for, as Forde states (1934: 461) "peoples do not live at economic stages. They possess economies . . . and combinations of them." The material culture of the basic "Forager" hunting and gathering economy was generalized to the extent that it could be modified to suit conditions in certain areas, certain valleys, or even certain occupation sites. Cultural adaptability and generalization is the key to survival, and, as Hawley (1950: 293) indicates:

All nomadic groups, including the simple hunting and collecting groups . . . accommodate to the environmental rhythms through movement. Such people move with the seasons and with the fluctuations of the food base . . . by moving to a new location. The seasonal round leads them through an orbit which is repeated year after year.

The Forager economic pattern may have persisted for

a very long time. Wedel (1961: 289) observes that

archaeological evidence suggests that hunters and gatherers who may well have been the Shoshoneans lived in the Wyoming Basin, carrying on a Forager way of life that had been characteristic of the area for some thousands of years before.

Perhaps "Forager," like "archaic" or "paleo-Indian," is a culture "type" defined by an association of formal traits "without regard to chronology," as Mason and Irwin (1960: 55) suggest. "Stemmed" points span the terminus of the "Forager" or Middle Period (Mulloy's "Late Middle Period") (Mulloy 1958: 209), and the beginning of the Late Period, roughly dated at A.D. 500.

Late Period: (A.D. 500 to A.D. 1800) The first portion of the Late Period, or the "first phase" of the "Late Hunters," is characterized by the use of corner-notched projectile points and a marked increase in the exploitation of bison drives. The drive concept may be of considerable antiquity, e.g., at the Powers-Yonkee site, dated circa 2485 B.C., bison may have been driven into a steep-walled erosion channel; however, the communal bison drive may not have been an important function in aboriginal economy until the Late Period.

The transition from corner-notched to side-notched projectile points is evident on many surface sites and in several stratified bison drives (Forbis 1960: 93; Kehoe and McCorquodale 1961: 188; Napton 1964b: 121, Fig. 11).

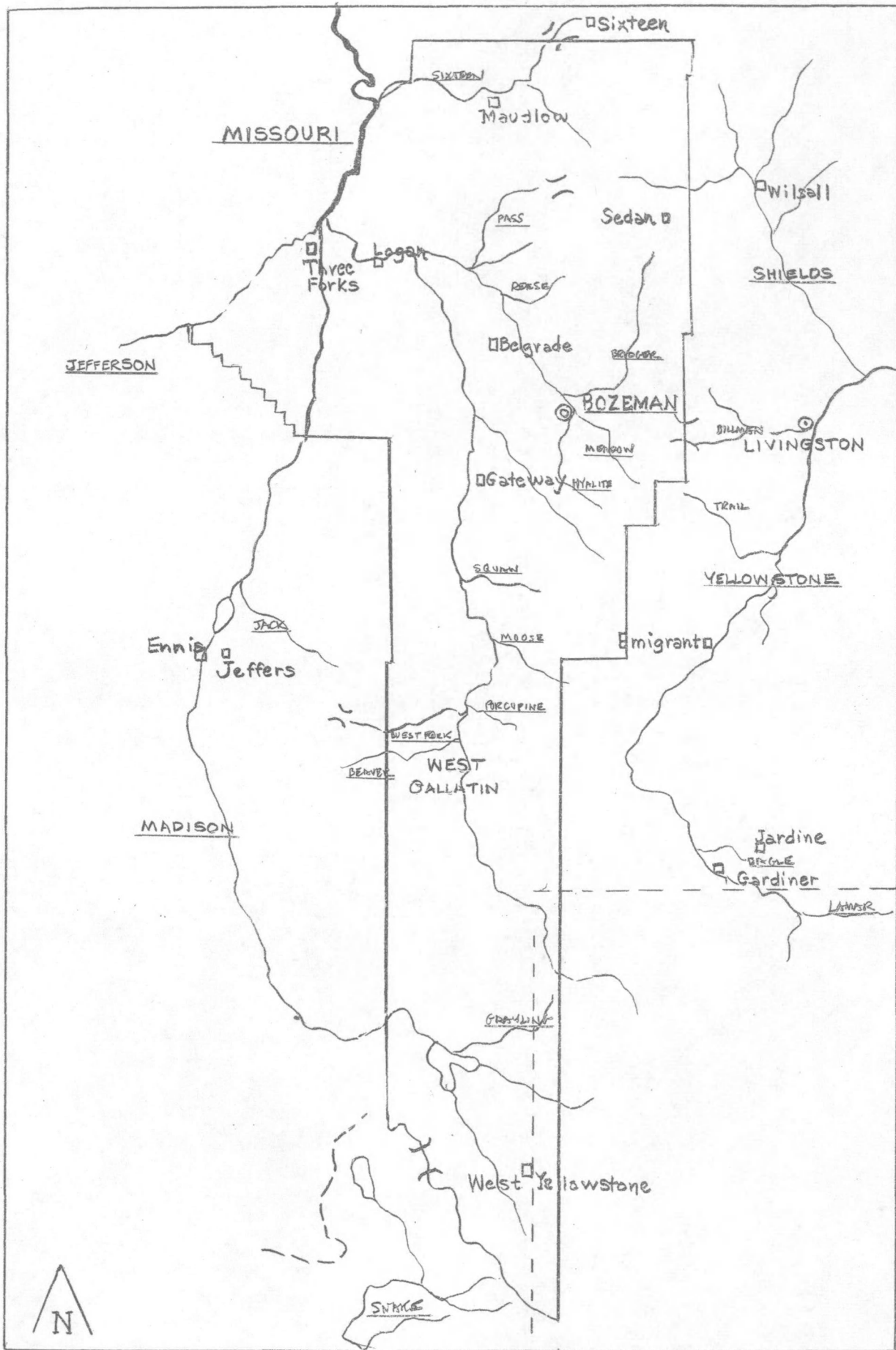
Corner-notched "Emigrant" projectile points occur in the lower levels of several Montana bison drives.

The material culture of the Late Period in Montana is extremely complex, due to an unprecedented influx of traits emanating from the Great Basin and the Middle Missouri (Mulloy 1958: 213). Side-notched projectile points, bison drives, "tipi rings," rock alignments, and various types of pictographs (Malouf 1960: 11-16) are among the diagnostics of the Late Period, as are ceramics and "the first evidence of dwellings other than caves" (Mulloy 1958: 213).

Small triangular-shaped side-notched projectile points appear in Gallatin area archaeological sites circa A.D. 1000. The initial regional occurrence of side-notched types continues to be given an earlier date, e.g., the Avonlea side-notched type, found in Alberta, is dated as early as A.D. 455 (Kehoe and McCorquodale 1961: 186). (This particular variety of side-notched point has not been reported found in the survey area.) Several thousand side-notched projectile points made of obsidian, ignimbrite, and chalcedony have been found in bison drives and in the (perhaps more recent) bison "falls" located in the survey area: Intermountain Flatbottom pottery, drills or perforators, grooved mauls, and diminutive plano-convex scrapers are often found in the middens of spatially associated occupation sites (Figure 40).

Historic Period: (A.D. 1800 to circa A.D. 1880)

The Historic Period, assigned an arbitrary beginning date of A.D. 1800, is marked in most Montana archaeological sites by the presence of "trade items." The Lewis and Clark Expedition (1805-6) and subsequent trappers, traders, and settlers introduced into the aboriginal material culture trade items such as beads, commercial pigments, and glass; and metal artifacts, including projectile points, kettles, axes, and knives.



GALLATIN

- FIGURE 6 -

CHAPTER III

THE GALLATIN AREA

Area Concept: Various authorities have defined the term "area," investing the concept with certain taxonomic attributes which exceed the scope and meaning of the term as it is employed by the present author. For example, Willey and Phillips (1958: 18-20) defined four principal spatial divisions: site, locality, region, and area:

A site is the smallest unit of space . . . a locality is a slightly larger spatial unit . . . a region is a considerably larger unit . . . roughly equivalent to the space that might be occupied by a . . . tribe. An area is a geographical unit very considerably larger than a region; it corresponds roughly to the culture area of the ethnographer.

Robert Heizer and Martin Baumhoff (1956: 33) defined "area" as follows:

For working purposes a division of the state [California] into nine archaeological areas has been made . . . These several areas, while they essentially reflect ecological zones, also have cultural distinctiveness.

Earl Swanson (1964: i) refers to the Birch Creek valley "area" as a "test unit." Carling Malouf (1950) describes a similar territory adjoining the Gallatin valley as "the Canyon Ferry Region."

For the purposes of the present study, the Gallatin area is a "natural area;" an entity defined by Hawley

(1950:80) as "any area physically delimited . . . so as to constitute a definite physiographic unit;" however, the Gallatin area is primarily a conceptual study unit arbitrarily superimposed on the convenient frame of reference provided by the Gallatin River drainage system (Figure 6). The Gallatin River--and most of the archaeological manifestations described in this study--are located within Gallatin County, Montana (Figure 7). Therefore, description of this political entity will approximately delineate the survey area.

General Description: The southern extremity of Gallatin County is bordered by Wyoming and Idaho; to the east is Park County and the Paradise valley of the upper Yellowstone River. The extensive river valleys of Madison and Jefferson Counties are west of the Gallatin; Broadwater County, containing the Helena Valley and the "Canyon Ferry Region" lies to the northwest; to the northeast is Meagher County.

Gallatin County, 2,517 square miles in extent, is 120 miles long, north to south, and some fifty miles wide. It derives its name from the Gallatin River, the two major branches of which flow almost entirely within the county. The East Gallatin River, a shallow stream averaging thirty feet wide, rises in the Bridger Mountains and flows west through the Gallatin Valley. The West Gallatin,

a river approximately 100 feet wide, begins in Yellowstone National Park and flows north through the narrow confines of the Gallatin Canyon. The two branches of the river converge near Logan, Montana. Five miles to the west, near Trident (Table 2), the Gallatin, Madison, and Jefferson Rivers unite to form the Missouri (Figure 6).

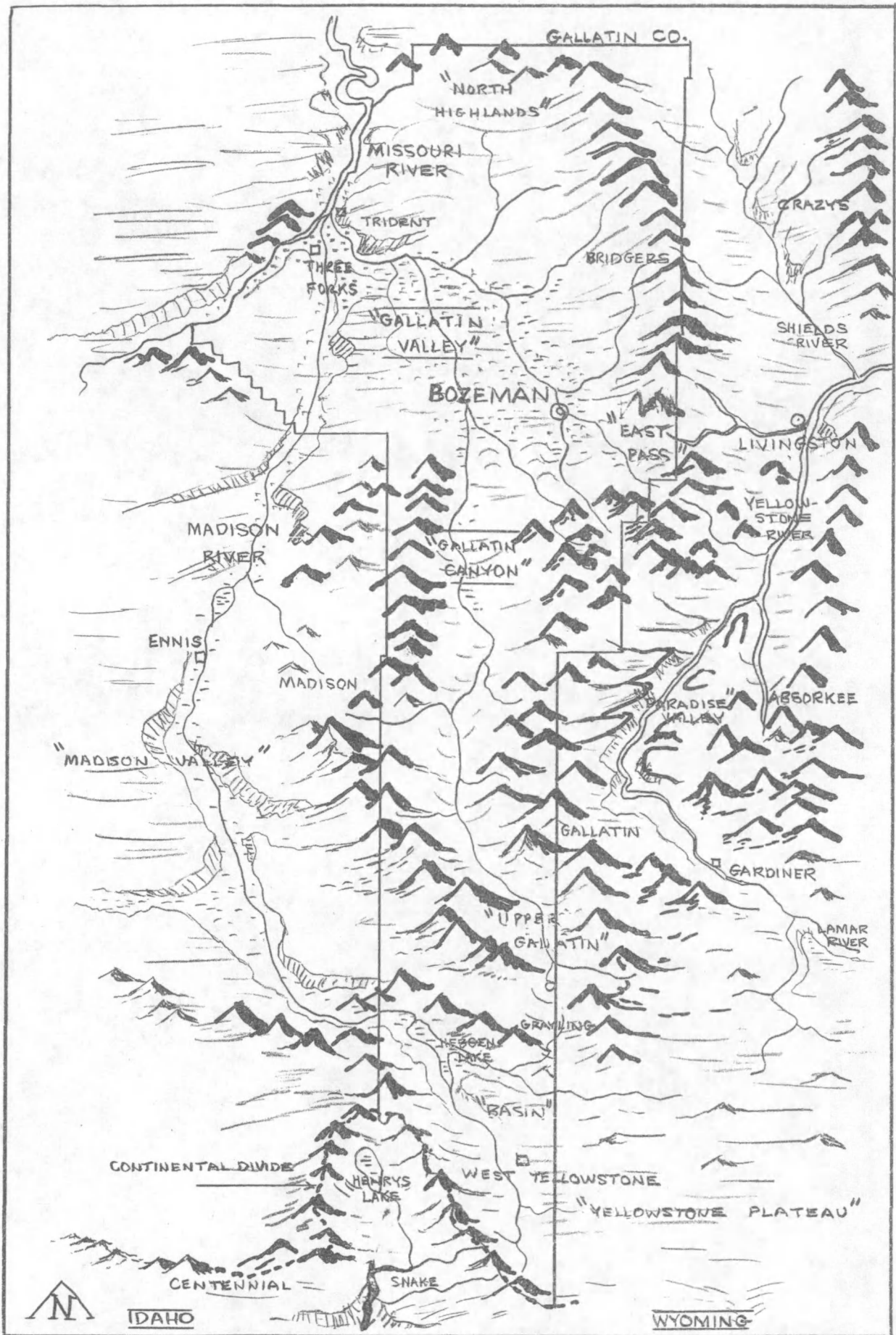
The Gallatin survey area consists of two discrete ecological and physiographic segments; the Gallatin Valley and the Gallatin Canyon. These are described below. One of the purposes of the archaeological survey project was to compare the archaeological remains found in the valley with those located in the canyon.

The Gallatin Valley:

Physiography: The valley is a west-sloping basin approximately twenty miles in diameter and 4,500 to 4,800 feet in elevation. The Continental valley fill has been intricately dissected by stream channels which drain northwest into the Missouri River. High mountain ranges encircle the valley: the Bridger Range, striking northwest along the east side of the valley, separates the Gallatin drainage from the Shields River, a tributary of the Yellowstone. The valley is sheltered on the east and south by high mountain ranges which include the summits of Mount Ellis, Hyalite Peak, and Mount Blackmore (10,190 feet). Southwest of the valley is the great rampart of the

Spanish Peaks; to the west are low hills dividing the drainages of the Gallatin and Madison Rivers. These mountain ranges cause moisture-laden air masses to rise; the resulting heavy precipitation provides the valley with abundant water. The mountain ranges that shelter the valley are of the utmost importance in making the area suitable for human occupation.

Physiography and Occupation: The physiography of the Gallatin area, of course, greatly influenced both prehistoric and historic occupation. Travel through portions of the Gallatin Valley was not particularly difficult in prehistoric times. A direct route less than twenty miles long led from the valley east, via Kelley Canyon, to Bozeman Pass and thence down Billman Creek to the Yellowstone River (Figure 8). Several routes led southwest into the Madison Valley, and, via Red Rock Creek, into Idaho. A nearly level pass permitted access from the Gallatin Valley north into the Helena Valley, and, through the valley of the Jefferson River, west to the Continental Divide. More difficult routes led northeast across Flathead Pass to the Yellowstone River, and north through the rugged Sixteen Mile Canyon to the headwaters of the Musselshell, a tributary of the Missouri (Figure 8). Another route led south from the Gallatin Valley through Spanish Creek to the Madison Valley and thence to Idaho. The southern extremity of the Gallatin Canyon merges into the West



MILES 0 10 20

GALLATIN

- FIGURE 7 -

Yellowstone Basin, an extensive intermontane valley traversed by the "Bannack Trail," one of the principal routes to the Snake River Plain in Idaho.

Ecology: Prior to 1860, the river banks and floodplains in the Gallatin Valley were heavily timbered with edaphic climax cottonwood (Populus, sp.), willows, choke-cherry brush, and buffalo-berry brush. The extensive northwest-sloping Gallatin Valley "bench-land" supported a grassland and sagebrush (Artemisia) climax. The native grassland community consisted of intermixed prairie tall-grass and plains short-grasses, including junegrass (Koelevia cristata), wheatgrass (Agropyron, sp.), and various grammas (Bouteloua, sp.).

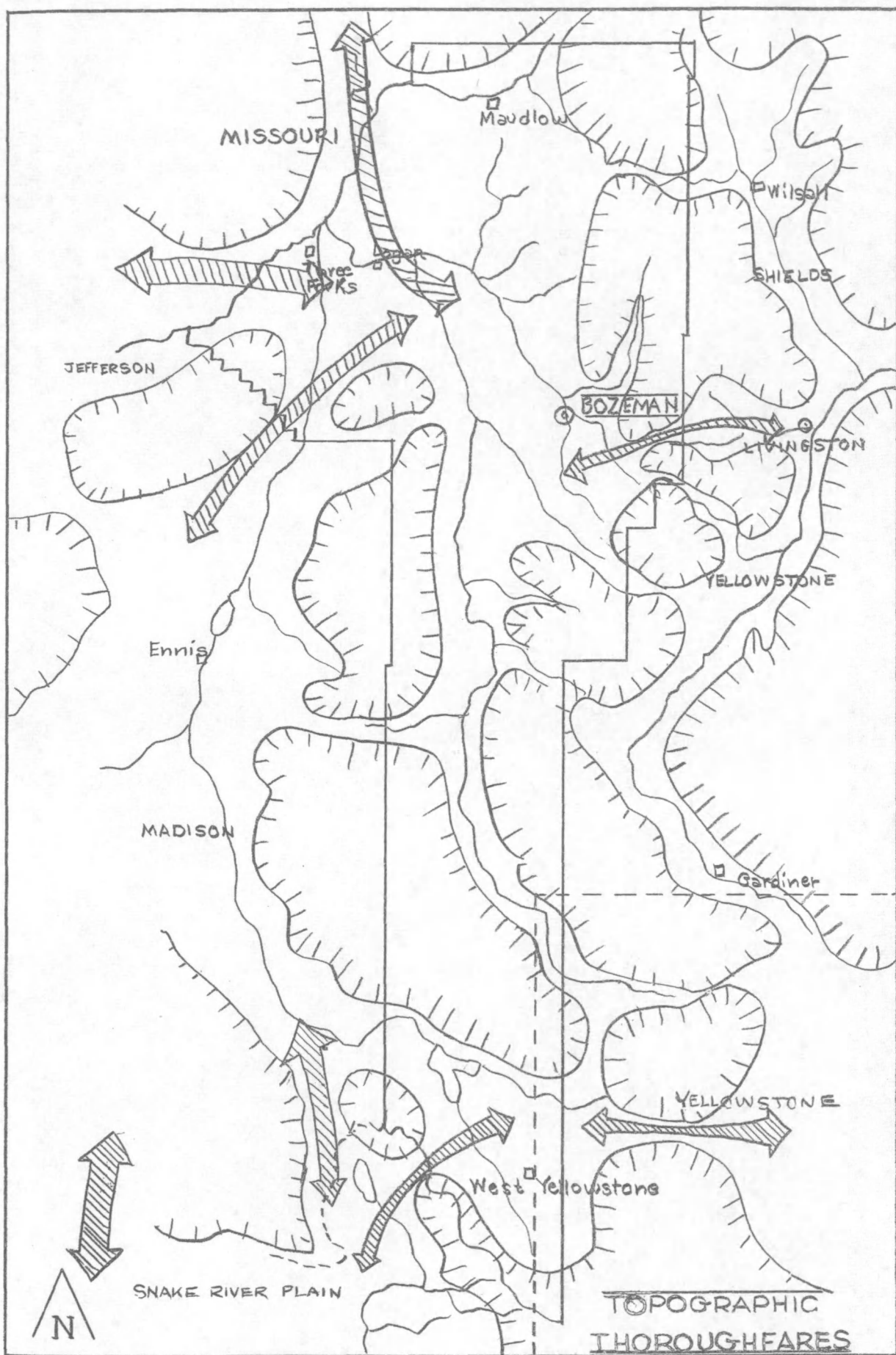
The lower portion of the Madison River drainage is contiguous to the Gallatin area. This locality receives less than ten inches average annual rainfall (Table 2): the arid soil supported needle grass, wiregrass, bunchgrass, and bluegrama. Scattered thickets of greasewood (Sarcobatus) and prickley-pear cactus (Cactaceae, sp.) were locally associated with these drought-resistant grasses (Montana Almanac 1958).

Climate: Annual precipitation in the vicinity of Bozeman averages eighteen inches; the annual snowfall averages seventy inches. The northwestern portion of the valley receives less than ten inches of precipitation per

year, however, the lowland streams are fed by meltwater from the snow accumulated on the high mountains circling the valley. The prevailing winds are from the west and southwest, shifting at night to the southeast: winter winds frequently blow from the east. The area is subject to "chinooks"--mid-winter winds that rapidly melt the accumulated snow. Periods of extreme cold weather rarely last more than a week or ten days. The maximum temperature recorded at Bozeman was 112 degrees; the minimum fifty-three degrees below zero, however, temperature extremes in midwinter and summer are not so severe as elsewhere in Montana. The average frost-free season in the Gallatin lasts about 100 days. The last killing frost is in May; the first severe frost about the middle of September.

Table 2 summarizes climatological data recorded at three stations located in the Gallatin area.

Soils: The well-drained chernozem soils of the Gallatin Valley may be divided into three groups based on color: (1) dark colored soils, (2) brown soils, and (3) light-brown or greyish colored soils. This classification correlates the content of organic matter with the distribution of precipitation. Foothill soils of the Bridger and Gallatin Mountain ranges consist of colluvial dark-colored altered gneiss and schists. Lowland soils



MILES 0 10 20

GALLATIN

-FIGURE 8-

TABLE 2: CLIMATOLOGICAL DATA: 1957; 1964

Station	Year	Temperature Extremes				Annual Temper- ature	Annual Precipi- tation
		High	Date	Low	Date		
Trident (1) (4036')(2)	1957	98	8/21	-42	1/26	45.3	9.32
	1964	99	8/4	-26	12/17	45.3	8.06
Bozeman (4856')	1957	93	8/9	-30	1/25	42.8	16.52
	1964	93	7/18	-29	12/17	43.1	19.85
West Yellowstone (6662')	1957	89	7/10	-54	1/27	35.0	25.16(3)
	1964	90	7/8	-52	12/17	33.2	28.60

- (1) Trident is located at the headwaters of the Missouri River, seven miles north of Three Forks, Montana.
- (2) Recording station elevation.
- (3) Annual snowfall, 1957, West Yellowstone, 200 inches.

Information from: Climatological Data: Montana, Annual Summary 1957, Vol. 60, No. 13, pp. 243-57; 1964, Vol. 67, No. 13, pp. 291-307, U.S. Department of Commerce, Weather Bureau. Ashville, 1958; 1965.

are degraded chernozems, light-brown in color, with a rather low organic matter content. These soils vary in texture from fine sand to silt loam. The alluvial soils adjacent to the streams and rivers range from grey to black in color, depending on the degree of accumulation of organic matter and alkali salts.

Heavy precipitation along the foothills and mountain slopes encourages the growth of vegetation and the consequent deposition of organic matter. West and north of the mountains precipitation decreases and the average annual temperature increases, producing arid to semi-arid microenvironments. Vegetation does not thrive in this dry zone, thus less organic matter is present in these local sierozem soils.

Water Systems: Some of the principal streams flowing from the mountains into the central Gallatin valley are Middle or Hyalite Creek, Bridger Creek, Reese Creek, Camp Creek, Bear Creek, Pass Creek, Ross Creek, Baker Creek, and Willow Creek. Most of these mature streams have high banks and well-formed stream terraces (Figure 6). There are a few small pluvial ponds in the central valley, but no large natural lakes.

The Gallatin Canyon

Physiography: The West Gallatin River flows from its source in Yellowstone National Park, Wyoming, through a deep

canyon some fifty miles long. The width of the canyon varies from a few hundred yards to approximately two miles. Rising at an elevation of 7,600 feet, the steeply aggrading river emerges from the canyon at an elevation of 5,000 feet. Steep cliffs, talus slopes, and precipitous mountains flank both sides of the river along most of its length. Beyond the southern extremity of the canyon is West Yellowstone, Montana, located in an extensive timbered basin drained by the Madison River (Figure 7). Extending east and west from the canyon are numerous side canyons drained by small creeks such as West Fork, Squaw Creek, Porcupine Creek, and Taylor Fork. The Madison Range, approximately twenty miles wide, lies east of the canyon. The range is crossed by several passes that provide difficult routes between the Gallatin Canyon and the Madison River Valley. Prominent summits of the Madison Range include Lone Mountain, Koch Peak, The Sphinx, and Lookout Mountain.

The Gallatin Range, located east of the canyon, separates the Gallatin Canyon and the Paradise Valley of the upper Yellowstone River. The range, ten to twenty miles wide, is crossed by only a few high passes. Prehistoric travel was difficult; even now there are no roads through these mountains. Mount Blackmore, Karest Peak, Steamboat Mountain, Ramshorn Peak, and Crown Butte are among the principal summits in the Gallatin Range.

Ecology: A montane coniferous forest biome dominates the mountain slopes west of the Gallatin Canyon. Dense stands of lodgepole pine (Pinus contorta), spruce (Picea, sp.), and various pines (Pinus, sp.) grow in the zone between 5,000 and 7,000 feet. A comparatively "open" zone of brush, aspen, and pine exists on the mountain slopes east of the river. The majority of the archaeological sites found in the Gallatin Canyon are associated with this "forest-edge" biome. Xerophytic flora such as sagebrush; and various species of montane flowers, including balsamroot, geranium, and lupine are common on the valley floor. The high mountain ranges located along either side of the canyon are areas of complex zonation, dominated by the coniferous forest biome.

Climate: The climate of the Gallatin Canyon is considerably more rigorous than that of the valley. The average annual precipitation at West Yellowstone is twenty-five inches (Table 2), and the average annual temperature in the Gallatin Canyon is approximately thirty-three degrees. The frost-free season in the canyon averages less than eighty days.

Soils: The valley floor is composed of tertiary coluvial fill, superimposed on alluvial gravels and glacial drift.

Water Systems: The main tributaries of the West Gallatin Canyon are Squaw Creek, Moose Creek, Spanish Creek, West Fork, Taylor Fork, Bacon Rind Creek, and Fan Creek. There are many small lakes in the high mountains west of the Gallatin Canyon.

CHAPTER IV

OCCUPATION OF THE GALLATIN AREA

Prehistoric Occupation: Archaeological evidence indicates that the Gallatin area was occupied in prehistoric times, however, the ethnic identity of the early inhabitants is unknown at present, and is likely to remain so. The Flathead-Salish--related linguistically, ideologically, and culturally to the tribes of the Columbia Plateau--may have occupied the Gallatin area prior to 1700. According to Malouf (1958: 111),

the earliest known center of Flathead life was in the Three Forks area of Montana and in the Bozeman valley. From here they ranged as far east as Billings and even to the Big Horn Mountains.

Teit (1930: 304) states:

The territory claimed by the [Flathead] included practically all of the present counties of Deer Lodge, Silver Bow, Beaverhead, Madison, Gallatin, Jefferson, Broadwater, and parts of Park, Meagher, and Lewis and Clark. This is the country said to have been occupied by the tribe about 1600 The only tribes on the Western Plains at this time [circa 1700] other than the Salish, were Shoshoni, Kutenai, and Blackfoot, all of which were well known [to the Flathead].

Teit (1930: 347) concludes:

It is uncertain how far Salishan parties went beyond their tribal boundaries to the east along the Missouri and Yellowstone, but it seems the Lower Musselshell and Big Horn were about their limits.

The assumption that the Flathead-Salish occupied the

Gallatin area prior to 1700 was neither challenged or confirmed by the archaeological material found in the survey area.

Extensive, if perhaps intermittent occupation of the Gallatin area by the precursors of the Túkendeka (Northern Shoshone) is suggested by various data, which is discussed in Chapter VIII.

Historic Occupation: Caucasian

The Gallatin Valley: Caucasian exploitation of the Gallatin Valley began in 1805, when members of the Lewis and Clark Expedition discovered the valley and named its principal river for Albert Gallatin, Secretary of the United States Treasury. Commerical exploitation immediately followed discovery; however, hostile Indians made fur-trapping a very hazardous occupation (Burlingame 1942: 18-43).

Phillips (1940: 74) states that the Warren Ferris party "trapped the Gallatin . . . caught but few beaver and were several times alarmed by parties of Indians." In 1810, George Drouillard, a former member of the Lewis and Clark Expedition, trapped beaver in the Gallatin Valley.

Drouillard states in his journal (Skarsten 1964: 288) that

hunger was again inflicting strong pangs upon us
 . . . when on the fourth day of crossing the Gallatin,
 one of the men killed a goose. 30 (sic) Snake Indians
 came among [us] and left without committing any depre-
 cations . . .

In April, 1810, Drouillard established a trading post

near the Three Forks of the Missouri " . . . on the neck of land between the Jefferson and Madison, about two miles above their confluence" (Skarsten 1964: 288). Drouillard was killed by "Blood Indians" who frequented the locality. They are said to have called the region "ahkoto waktai sakum," (sic), or "many-rivers-come-together-country" (Houston 1933: 4), alluding to the junction of the three rivers of the Missouri.

Exploitation of the valley increased, while the Indians attempted to continue their traditional lifeways. Agriculture, rather than mining, was the principal factor contributing to the permanent Caucasian settlement of the Gallatin Valley. Main routes of travel from Fort Benton (the head of steamboat navigation on the Missouri) to the gold camps in the mountains crossed the Gallatin Valley. In 1864, John Bozeman led a group of settlers to the valley and established the settlement that was subsequently given his name.

Indians intent on peaceful purposes often visited the Gallatin Valley and the Montana Southwestern Sub-Region. In 1863, while residing in Bannack, Montana Territory, Emily Meredith (Hakola 1962: 247) remarked:

Last winter there were a few Indians here; one night in a drunken spree some men fired into them, killing five Indians and two white men . . . A short time ago I was told one evening about dark that there was a party organizing to go out and attack the Indian camp. About 200 Indians [a mixed band of Paiutes, Shoshones, and Bannocks led by Chief Winnemucca] were passing

westward from a hunt on the Yellowstone . . . [they] escaped the attack.

According to McLemore (Hakola 1962: 244), when the Gallatin Valley settlers learned of the Fetterman Massacre, they

grew fearful lest the hostile Sioux and Cheyenne make raids into that region. At a meeting in Bozeman, March 18, 1867, attended by 52 citizens, to consider ways and means for a defense, it was decided to construct a stockade 28 X 24 feet . . .

The attitude of some of the early settlers is perhaps implicit in an editorial written by W. W. Alderson (Houston: i):

[The Gallatin Valley] was a land of fair promise, of course, with its extensive acreage of nutritious pasturage, but even that was only available at the risk of encountering at any day or hour, a band of hostile Indians to dispute the white man's right of possession.

In 1867, Fort Ellis, a military post, was established near Bozeman. Hayden visited the post in 1870, and remarked (1872: 44):

Fort Ellis, although considered one of the extreme frontier posts, and supposed to be located among hostile tribes of Indians . . . is a very pleasant station.

The fort was abandoned nineteen years later. According to Hamilton (1905: 242), in 1869 "the Sioux, Arapahoes, and Cheyennes became very hostile, even making raids on the farmers in the Gallatin Valley."

Pioneer journals mention various difficulties between the settlers and the Blackfeet, Shoshone, Bannock, Crow, and

Flathead. In 1874, the "Yellowstone Expedition" departed from Bozeman to "open up" Wolf Creek County. Houston (1933: 13) states: "They had several skirmishes with Indians . . . the men killed several Indians, frightened about 30 from a couley (sic) got the scalps of 13 Indians."

The Indians attempted to continue their traditional lifeway in the face of increasing Caucasian settlement in the valley. Matt Neibel, a pioneer settler, observed an incident that occurred in April, 1881, at Shedd's Bridge:

By daylight the Blackfeet broke camp and started for the bridge. Shedd was there to exact his toll of 25 cents for every brave and his horse, every squaw and her horse, and every child travelling by pony. The Blackfeet decided . . . they would pay 25 cents for each buck that crossed the bridge but the women and children would have to swim their horses across the Gallatin.

Neibel and Shedd stood at the bridge and watched the Indian women and children wade into the cold waters on their horses and swim them across the stream. At the eastern bank the party all gathered together and led by the bucks went through the cottonwoods and out across the hills on the trek to the east.

Virginia City, Bannack, Helena, Bozeman, Butte and Blackfoot City were frequently visited by small groups of Indians. Members of the author's family recall that Shoshone or Bannack Indians were annual visitors to Bozeman for the purpose of picking chokecherries growing on the dense brush along the banks of Sourdough Creek. As the Indians departed from Bozeman they ascended "Pete's Hill," located at the east end of Story Street, crossed the valley to Fort Ellis, and camped in Kelly Canyon (Frances Napton,

personal communication, 1964).

Several pioneer journals state that the Shoshone Indians made frequent visits to the Gallatin Valley; perhaps they were trying to prolong an established, traditional life-way representing a continuation of earlier excursions to the area for the purpose of using the bison drives.

Gallatin Canyon: In 1900, the first wagon road into the Gallatin Canyon was built from Salesville (Gallatin Gateway), located near the mouth of the canyon, to Taylor Fork. Construction was difficult in the upper canyon; the road was not completed to West Yellowstone until 1911. In 1932, U. S. highway 191 was built through the canyon; the hard-surface road remained unchanged until 1953, when the highway was extensively rebuilt, straightened, and resurfaced. Large portions of the Gallatin Canyon were virtually undisturbed until recent years; indeed, the principal settlement of the canyon has occurred in the years since World War Two.

There are no references to Indians in any known sources pertaining to the "early days" of pioneer life in the Gallatin Canyon.

CHAPTER V

THE ARCHAEOLOGY OF THE GALLATIN AREA:

INTRODUCTION TO THE DESCRIPTION OF THE SITES

Field Procedure: A brief review of the field techniques employed during the archaeological survey may be of interest to future investigators. Various automobiles, themselves artifacts of archaeological interest, were used to convey the survey party from Bozeman, Montana to the field. Horses were used for transportation in the mountains east of the Gallatin Canyon, since rental mounts were easily obtained. Some of the more remote districts in the high mountains were examined on foot.

Many sites were discovered by means of "prediction." This is simply the process of observing local terrain, and, by assessment of various factors, predicting the most likely location for aboriginal occupation. The technique (if it may be called that) is also used by naturalists (Andrewartha 1961: 10). Prediction permits rapid sampling of the recent occupation sites in an extensive area, but of course cannot provide detailed areal coverage, nor is it always useful in locating sites occupied by "early man." Many localities in the survey area were not given detailed scrutiny, consequently the survey is limited, or preliminary. Ford and

Willey (1949:20) made the following appraisal of their archaeological survey of the Viru Valley, Peru:

We can only estimate the thoroughness or completeness of our survey. The 315 sites recorded are . . . about one-fourth of the prehistoric sites that can be observed on the surface.

Archaeological sites located in the canyon and valley were recognized, of course, by the presence of prehistoric cultural features or other indications of aboriginal occupation or utilization. Most of the sites found in the survey area cover less than one acre, however, the Madison Bison Drive covers more than one square mile (Figure 14).

Flakes were found on the surface of nearly every site, but many sites were devoid of artifacts. Relic hunters--many of whom collect only projectile points--have visited most of the Gallatin area archaeological sites. This sort of destruction of the area's archaeological resources is particularly insidious. "Point hunters" visit sites located in the remote mountains, as well as those found in urban areas. For this reason it is likely that even the surface collections made by professional archaeologists might not constitute valid or representative samples of the original material culture of certain sites.

The occupation sites recorded by members of the survey party were examined by walking at random over the site surface. Regular or systematic patterns could not be followed because the surface of most of the sites was partially

obscured by dense clumps of sage brush. Large sites were divided into "collection areas." The flakes and artifacts found in each area were collected and sacked in individual paper bags. Each site was given a field survey number and an appropriate place-name. The legal location of the sites was plotted on U. S. Geological Survey and Forest Service maps. Sites located adjacent to distinctive topographic features (such as the confluence of water-courses) could be located and mapped with considerable accuracy. In this regard, the Gallatin area is unlike the relatively featureless plains of eastern Montana. The site description and legal location were recorded in large notebooks; black and white photographs were taken of most of the sites and significant features.

India ink was used to label the artifacts; the identification number "S-42-1," for example, indicates that "S" is a site located in the Gallatin area, "42" is the site number, and "1" is the artifact number. All flakes were retained, counted, and sorted into categories based on material composition, color, and size.

Intensive study of the flakes and artifacts will probably provide information pertaining to material preference, flaking techniques, distribution of material within the survey area, choice of material, selection of material in relation to projectile point types, the number and character of "utilized flakes" (Cf. Binford 1963: 193-221), the

incidence of percussion and pressure flaking, the trace-element composition and hydration rate of obsidian flakes, the size-ratio of the flakes, and the number of flakes per site.

The flakes and other material found on the balance of the survey area sites will be described in subsequent reports pertaining to the Gallatin area, to be published as circumstances permit.

Archaeological Sites; Nomenclature: Twelve "types" of sites were discovered in the survey area:

(1). An occupation site includes almost any type of domestic habitation site; usually these are open-air "camp-sites," dwelling areas, or hunting camps. Surface occupation sites are often situated on adequately-drained level surfaces located near a source of water. Flakes or spalls are usually found on the surface of occupation sites. Flakes, of course, are the debris produced in the process of fabricating artifacts. Flakes are sometimes called "chips," although some researchers have made a definite taxonomic distinction between these terms (White 1963: 23). Mauls, pestles, manos, metates, and other implements made from cobble stones, which were modified by pecking or grinding, are sometimes found on occupation sites (Figure 26). Potsherds representing various ceramic traditions are present on many sites. Most of the Gallatin area occupation sites were subject to the

vicissitudes of inclement weather: the annual cycle of rainfall, snowfall, freezing, thawing, and dry heat has precluded the survival of most of the perishable items in the material culture.

It would appear that the majority of the Gallatin area surface sites were serially occupied. Serial occupation is indicated by the undifferentiated association, on the site surface or within the sub-surface strata, of artifacts and features that have been found in the components of stratified sites, the geological and cultural features of which may represent or indicate passage of a considerable length of time. Various cultural phenomena may be observed in unequivocal spatial juxtaposition on the surface of serially occupied sites, however, these manifestations may or may not be culturally or temporally associated.

(2). A ceramic site is an occupation site, the material culture of which includes fragments of aboriginal pottery.

(3-4). An occupied cave differs from a rockshelter according to the depth of the concavity in the rock formation. The ceiling of a cave is usually horizontal; the rockshelter ceiling is formed by an overhanging portion of the cliff formation. A rockshelter is an "exterior" cave (Cf. Butzer 1964: 198).

(5). A pole lodge differs from a log lodge in that the former is built of poles laid vertically to form a cone-

shaped dwelling (Plate II). Log Lodges resemble the pioneer log cabin. The base logs (or, in some cases, all of the logs forming the walls) are laid horizontally. Frequently, the floor plan takes the shape of a square or pentagon open to one side. Mortar or chinking was not used. It is said that log lodges were sometimes roofed (Conner, personal communication, January, 1965).

(6). Interment refers to primary or secondary inhumations or "burials" found in the survey area. Montana pioneers observed many interments made in trees or on scaffolds. None of these have survived in the Gallatin area, however, interments have been found in small caves or niches in rock formations.

(7). Bison drive is a generic term that describes all types of sites where bison were driven or stampeded over cliffs, stream terraces, eroded vertical "cutbanks," or other precipices. The bison "fall" is a type of drive: bison were driven down a steep incline into a "compound" or enclosure built at the base of the incline. Projectile points are found among the bison bones in the drive "deposits" located at the base of the drive precipices or inclines. Many of these deposits are stratified; some exceed thirty feet in depth.

(8). A quarry is an outcrop of rock from which the Indians obtained fragments of material suitable for modification into artifacts.

(9). A rock alignment is a series of cobbles or boulders symmetrically arranged in linear or curvilinear configurations. Usually found on elevated locations such as secondary stream terraces or hilltops, rock alignments may have had ritual significance.

(10). Tipi rings are circular stone alignments that occur individually or in groups on sites found throughout Montana and adjacent states. The stones forming these circles might have been used during inclement weather to weight or hold down the edges of skin tipi covers. Presumably, when the tipi cover was removed, the circle of stones remained approximately in position, marking the location of the dwelling.

(11). Pictograph caves are similar to the site of that name located near Billings, Montana. Usually pictograph caves were not used for domestic occupation.

(12). Pictograph sites are groups or "panels" of designs or motifs that the Indians painted on the surface of rock cliffs or large boulders. "Motifs" (minimal design features) include anthropomorphic, or human representations; zoomorphic, or animal figures; cruciform motifs (Figure 10); "tally marks" (groups of short vertical lines); "circles;" abstract patterns; and many other stylized symbolic designs. Most pictographs in the survey area are red in color; the paint consisted of oxide of iron pigment mixed with an organic vehicle. Pictographs painted in black, white, and

green have been reported found in Montana, but not in the majority of sites located in the survey area. Pictographs are found throughout Montana; petroglyphs (designs carved or incised on rock surfaces) are not common. Pictographs may have served ritual, symbolic, or expressive purposes (Figure 37).

Archaeological Sites; Function Categories: The sites found in the survey area can be classified in "function categories," one of several potentially useful conceptual orderings (Table 3). Postulation of the "function category" (or site-type) is based on the assumption that each site served some purpose or function which presumably is evident to the archaeologist upon examination of the site's principal features. Listed below are examples of the "function category" classification:

24 GA 302 Sedan: This listing indicates that the site is described in this study.

24 MA 307 /Renne/: The diagonal brackets indicate that the site was recorded by members of the Gallatin area survey project, however, it is not described in the present report.

24 GA 401 *Robinson*: The asterisks denote that the site is located in the Gallatin area, but was recorded by field groups not under the supervision of the author. These sites are not described or discussed in this study, unless

they were initially recorded by members of the Gallatin area survey project.

24 GA 310 (Squaw Creek): The parentheses indicate that the site has but a minor function in this category.

Archaeological Sites; Comparative Occurrence: Table 4 consists of six titled columns which impart the following information.

Column One: (Site "function category" previously described.)

Column Two: The total number of survey area sites that have been reported in this study.

Column Three: A listing of other known sites located by the survey, but not reported in this paper.

Column Four: The lateral total of columns two and three.

Column Five: An approximate estimate, expressed as a percentage, of the total sites listed in columns two and four. The number of sites reported in this study is compared to the number of known sites not reported.

Column Six: The postulated frequency of sites, indicating the probability of finding more of each type of site. Obviously, the estimate is highly conjectural.

Archaeological Sites; Chronological Ordering: Sites found in the survey area can be seriated in an approximate or relative sequence. Chronological ordering outlined in

Table 5 is based on the established or estimated temporal span of various "diagnostic" cultural traits, including projectile points, ceramics, and stylistic changes in certain types of implements. Several different types of projectile points were found on the surface of most of the Gallatin area sites. These specimens were seriated in relation to the general regional chronological projectile point sequence. Thus, some of the sites found in the Gallatin area were "dated" by the spatial or contextural association of certain types of temporally diagnostic projectile points and artifacts. In other words, the sites were "dated" by the artifacts--the artifacts were not dated by the sites--which would have been much more desirable. Some aspects of this problem have been discussed in an extremely interesting article written by Dempsey and Baumhoff (1963: 469-509).

Regional--if not continental--trends in projectile point types seem evident (Cf. MacNeish 1964: 32). There are certain exceptions, such as the Simonson site (Agogino and Frankforter 1960: 414-5); however, many stratified sites yield a series of projectile point types that exhibit relatively predictable trends.

Ford (1949: 34) comments "it is doubtful whether an excavated collection in a thin site is in any way superior to a surface collection for dating that site." Ford's observation applies only in principle in the Gallatin area, since so much of the surface material has been selectively removed

by relic collectors.

Table 5 represents an approximate seriation of forty-five sites in reference to five cultural periods. The temporal span of site-occupation is tentative; since it is difficult to estimate the temporal position of serially occupied sites. The symbol "X" following some of the site numbers indicates that the available data is insufficient for postulation of a tentative chronological estimate.

Description of the Sites; Procedure: The sites found in the Gallatin area will be described in terms of their environmental context: in some cases the relationships between the sites are thus more clearly delineated. The Smithsonian Institution site identification system is used for uniform site designation. Smithsonian series site numbers were made available to the author by Dr. Dee C. Taylor, Department of Anthropology and Sociology, University of Montana. These numbers were allocated to the University of Montana by authority of the River Basin Surveys, Lincoln, Nebraska.

The Gallatin area is located entirely within Montana (although the southeastern periphery of the area adjoins Wyoming). Montana is represented by the figure 24; the counties are Gallatin (GA), Madison (MA), Broadwater (BW), Jefferson (JF), and Park (PA). The forty-five sample sites, their Smithsonian system designation, field number, and legal location are listed in Table 6.

TABLE 3. ARCHAEOLOGICAL SITES; FUNCTION CATEGORIES:Occupation Sites

24 GA 302	Sedan	24 GA 320	Portal Creek
24 GA 303	Flathead Summit	24 GA 321	Cedar Pass
24 GA 304	Reese Creek	24 GA 322	Beaver Creek
24 GA 306	Thompson Ranch /Renne/	24 GA 323	Rainbow
24 GA 308	Valley View	24 GA 324	Tepee-Gallatin
24 GA 309	Watson Ranch	24 GA 326	Big Spring
24 GA 310	Kelley	24 GA 327	Targhee Pass
24 GA 312	Greek Creek	24 MA 302	Ennis Lake
24 GA 313	Camp Creek	24 MA 306	/Elk Creek/
24 GA 315	Chisholm	24 BW 401	Battlefield
24 GA 316	(Squaw Creek)	24 JF 401	Ann's
24 GA 317	Moose Creek	24 PA 321	Wilsall
24 GA 318	West Fork	24 PA 322	Clyde Park
24 GA 319	Beaver Hills	24 PA 324	Maxey
		24 PA 325	Eagle Creek

Ceramic Occupation Site

24 GA 314	(Madison)
24 MA 301	Jeffers
24 MA 307	/Sterling/

Log Lodge

24 GA 330	/Sixteen/ /Bull Mountain/
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Occupied Cave

24 MA 305	Point of Rocks /Sunlight/ /Hand-Hold/ /Andesite/
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Interment

24 PA 324	(Maxey)
24 GA 314	/Logan/
24 GA 307	Pete's Hill *Sappington*

Occupied Rock Shelter

24 GA 401	/Sand Creek/ *Robinson*
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Bison Drive

24 GA 314	Madison
24 PA 308	Emigrant
24 PA 309	Story
24 GA 328	/Schwartz/
24 GA 305	Eukes
24 GA 311	Hot Springs /Whitehall/

Pole Lodge

24 GA 325	Snowflake
24 YE 301	Wickiup

(Kill)

24 PA 321 (Wilsall)
 24 GA 313 (Camp Creek)
 24 GA 322 (Beaver Creek)
 24 PA 324 (Maxey)

Quarry

24 GA 316 Squaw Creek
 /Logan Series/

Rock Alignment

24 MA 303 Cedar Fan
 Napi
 Cottonwood Creek

Tipi Rings

24 MA 314 (Madison)
 24 MA 304 Red Bridge
 24 BW 401 (Battlefield)
 24 JF 402 Boulder Hollow
 24 PA 324 (Maxey)

Pictograph Caves

24 GA 301 Blacktail
 Mountain
 24 MA 305 (Point of Rocks)
 24 PA 326 Old Kentuck

Pictograph Sites

24 JF 403 Cactus Inn
 24 PA 323 Carter Bridge
 /Homestead/
 /Whitetail/

TABLE 4: ARCHAEOLOGICAL SITES; COMPARATIVE OCCURRENCE:

Site Category	Reported Sites	Other Known Recorded Sites	Total Known Sites	Percent of Sites Reported in this Study	Postulated Frequency of Sites (1-10)
<u>Occupation</u>	27	200	227	12	10
<u>Ceramic Site</u>	1	1	2	50	6
<u>Occupied Cave</u>	1	3	4	25	1
<u>Occupied Rock Shelter</u>	0	2	2	0	2
<u>Lodge: Pole</u>	2	0	2	100	3
<u>Log</u>	0	2	2	0	2
<u>Interment</u>	1	3	4	25	2
<u>Bison Drive:</u>					
<u>Jump</u>	3	4	7	40	4
<u>Fall</u>	2	3	5	40	3
<u>Trap</u>	0	0	0	0	2
<u>Bison Kill</u>	0	0	0	0	5
<u>Quarry</u>	1	2	3	33	5
<u>Rock Alignment</u>	1.	2	3	33	6
<u>Tipi Ring</u>	2	10	12	16	9
<u>Pictograph Cave</u>	2	0	2	100	4
<u>Pictograph Site</u>	2	2	4	50	8
TOTALS	45	234	279	17%	-

TABLE 5: ARCHAEOLOGICAL SITES; CHRONOLOGICAL ORDERING:

PERIODS	EARLY	MIDDLE	LATE	HISTORIC
24 GA 301				
24 GA 302				
24 GA 303				
24 GA 304				
24 GA 305				
24 GA 306				
24 GA 307				
24 GA 308				
24 GA 309				
24 GA 310				
24 GA 311				
24 GA 312				
24 GA 313				
24 GA 314				
24 GA 315				
24 GA 316				
24 GA 317				
24 GA 318				
24 GA 319				
24 GA 320				
24 GA 321				
24 GA 322				
24 GA 323				
24 GA 324				
24 GA 325				
24 YE 301				
24 GA 326				
24 GA 327				
24 MA 301				
24 MA 302				
24 MA 303				
24 MA 304				
24 MA 305				
24 BW 401				
24 JF 401				
24 JF 402				
24 JF 403				
24 PA 321				
24 PA 322				
24 PA 323				
24 PA 324				
24 PA 308				
24 PA 309				
24 PA 325				
24 PA 326				

TABLE 6: ARCHAEOLOGICAL SITES; TABULATION:

Gallatin County

24 GA 301	95	S 9,	T3N,	R5E
24 GA 302	115	S 34,	T3N,	R7E
24 GA 303	94	S 30,	T3N,	R6E
24 GA 304	3	S 10,	T1N,	R5E
24 GA 305	71	S 8,	T1N,	R5E
24 GA 306	4	S 18,	T2S,	R6E
24 GA 307	16	S 18,	T2S,	R6E
24 GA 308	49	S 18,	T2S,	R6E
24 GA 309	100	S 14,	T2S,	R6E
24 GA 310	44	S 12,	T2S,	R6E
24 GA 311	66	S 24,	T2S,	R5E
24 GA 312	7	S 23,	T5S,	R5E
24 GA 313	103	S 27,	T2S,	R3E
24 GA 314	45	S 27,	T1N,	R2E
24 GA 315	43	S 23,	T4N,	R5E
24 GA 316	48	S 31,	T4N,	R5E
24 GA 317	46	S 36,	T5S,	R4E
24 GA 318	8	S 32,	T6S,	R4E
24 GA 319	13	S 17,	T7S,	R4E
24 GA 320	17	S 13,	T6S,	R4E
24 GA 321	18	S 34,	T6S,	R2E
24 GA 322	41	S 17,	T7S,	R4E
24 GA 323	116	S 28,	T7S,	R4E
24 GA 324	53	S 7,	T9S,	R5E
24 GA 325	117	S 16,	T9S,	R5E
24 YE 301	55	S 26,	T9S,	R5E
24 GA 326	118	S 23,	T12S,	R4E
24 GA 327	75	S 21,	T13S,	R4E

Madison County

24 MA 301	104	S 35,	T3S,	R1W
24 MA 302	108	S 1,	T3S,	R1W
24 MA 303	114	S 9,	T6S,	R1E
24 MA 304	79	S 36,	T2S,	R1E
24 MA 305	27	S 5,	T1S,	R4W

Broadwater County

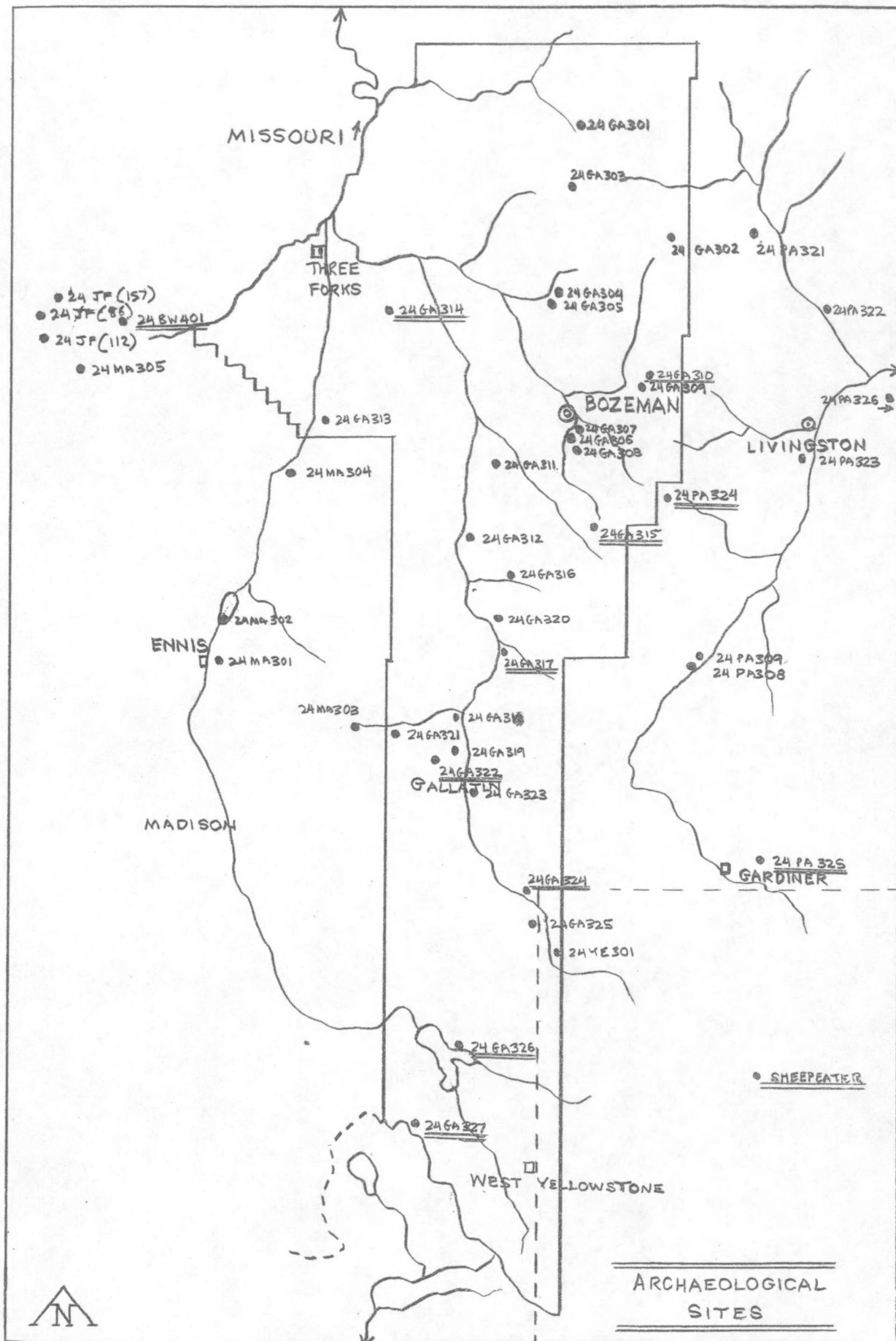
24 BW 401	42	S 16,	T1N,	R1W
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Jefferson County

24 JF 401	86	S 32,	T3N,	R2W
24 JF 402	157	S 32,	T3N,	R2W
24 JF 403	112	S 18,	T1N,	R5W

Park County

24 PA 321	70	S 3,	T2N,	R8E
24 PA 322	105	S 33,	T2N,	R9E
24 PA 323	30	S 11,	T3N,	R9E
24 PA 324	50	S 27,	T3N,	R9E
24 PA 308	38	S 5,	T6S,	R8E
24 PA 309	36	S 5,	T6S,	R8E
24 PA 325	96	S 18,	T9S,	R9E
24 PA 326	40	S 26,	T3S,	R11E



GALLATIN
-FIGURE 9-

CHAPTER VI

THE ARCHAEOLOGY OF THE GALLATIN AREA:

DESCRIPTION OF THE SITES

Introduction: The forty-five sites found in the Gallatin area are numbered according to an approximate geographical sequence extending from north to south (Figure 9). Description begins with sites recorded in the northern extremity of the survey area, followed by sites located in the Gallatin Valley, Gallatin Canyon, Madison Valley, and Paradise Valley.

Gallatin Valley Sites:

24 GA 301 Blacktail Mountain Caves: In May, 1958, the author investigated two small caves on Blacktail Mountain, a prominence in the Bridger Range, located northeast of Bozeman, Montana. Francis Niven, then president of the Montana Archaeological Society, subsequently visited the caves and named them the "upper and lower Blacktail Mountain caves" (Niven 1958: 5-7). Local ranchers have known of the caves for many years: a well-defined motor track branches from a nearby county road, crosses the alluvial fan of Little Rocky Canyon, and terminates immediately below the mouth of the caves. There is no indication of occupation on the

canyon floor; however, there are pictographs on the walls of both caves. In 1958, the author traced and photographed the pictographs, and, on a later occasion, Dr. C. I. Malouf, Richard Malouf, and the author tested the fill in the upper cave. Two opaque blue glass beads (S-95-1, 2) were found at a depth of three inches in the fill near the mouth of the cave. These beads were probably obtained, circa 1830, from the American Fur Company traders.

In 1959, a small field crew supervised by the author excavated the deposit in the lower cave. The single-stratum cave fill consisted of an unconsolidated mixture of pine needles, sticks, twigs, pebbles, and aeolian sand. A single archaeological specimen, a red jasper flake (S-95-3) was found six inches beneath the surface.

The pictographs on the walls of both caves were painted with a red pigment probably made from hematite (Figure 10). There are nine anthropomorphic motifs in the upper cave: four pronograde zoomorphic motifs are oriented toward the observer's left. One of these motifs resembles a mountain goat. This particular motif, perceptibly faded, may be older than the majority of the motifs. Among the motifs are four small circles, two cruciform motifs, and two "abstract" motifs. Each motif is a distinct entity, although several seem to form distinct "groups." Three zoomorphic motifs are juxtaposed, probably in meaningful or intended association, on a small joint plane of the cave

wall.

Cruciform motifs, small circles, and simple anthropomorphic and zoomorphic representations are characteristic of the pictographs of the Montana Western Region (Elrod 1908: 3-8; Griswold 1953: 27-9). Similar motifs appear in the extensive pictograph site near Libby (Napton 1953, Field Notes), and in Idaho (Teit 1930: 286). These motifs correlate with Gebhard's Type One (Gebhard and Cahn 1950: 222), found in the pictograph sites located near Dinwoody, Wyoming.

Some of the pictographs that appear on the wall and ceiling of the lower cave were illustrated in the Niven report (1958: 5). A motif resembling an over-sized human hand print has been defaced by vandals.

The limestone formation of both caves is veined with intrusive red hematite. Perhaps the pigment used in painting the pictographs was prepared from hematite acquired inside the caves.

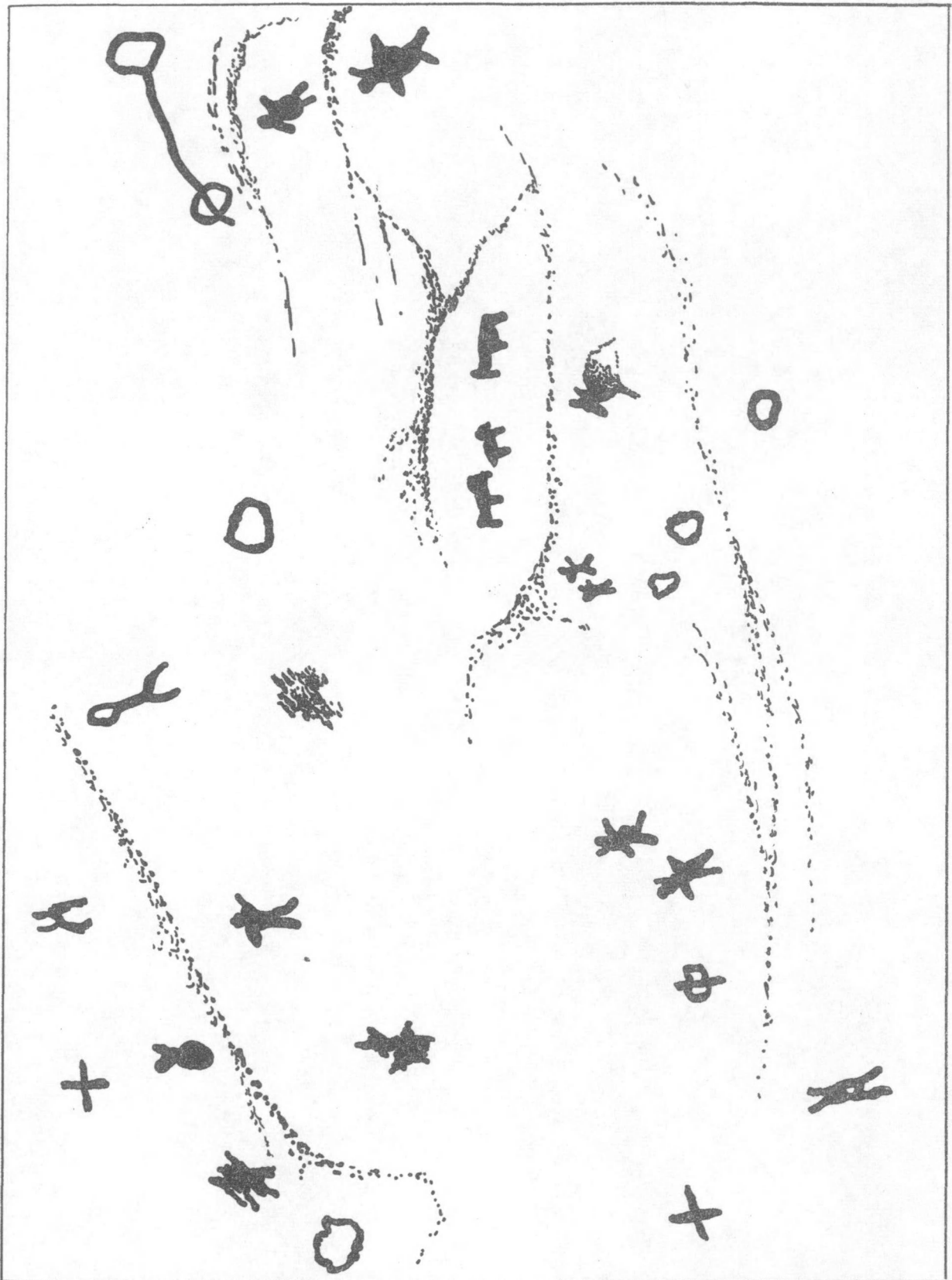
Pictographs might be related to the well-known "Vision Quest" ritual (Malouf 1961a: 9). Short vertical marks that appear on many pictograph panels are said to tally the number of days a vision-seeker lingered at the site. Steward (1937: 405-25) cautions against the impulse to "interpret" pictographs; however, perhaps speculation is justifiable (Cf. Conner 1962: 20).

Anthropologists have interviewed several Flathead-Salish Indians who assert that the pictographs were "painted


long ago by the old people" (Cf. Malouf and White 1953: 31). Today some Flathead-Salish claim that the pictographs found on their western Montana reservation were painted by members of their nation (Napton and Lang, 1964, Field Notes).

24 GA 303 Flathead Summit: A small occupation site is located at an elevation of 7,000 feet on the summit of Flathead Pass in the Bridger Range. Members of the survey party collected thirty chert flakes and one broken "oval" knife. The origin of the name "Flathead Pass" is uncertain: the small collection of lithic material cannot be attributed to any ethnic group. This site is of interest because it is located on the summit of a high pass between the Gallatin Valley and the Shields River, which drains into the Yellowstone.

24 GA 304 Reese Creek: The floodplain and low terraces adjacent to Reese Creek, located in the north-central Gallatin Valley, were the scene of intensive and extensive aboriginal occupation. The general locality might have been suitable for occupation during the winter season, a possibility that is considered in the discussion section of this study. Several dozen pestles, grooved mauls, and other implements used in the preparation of vegetal foods have been found by local ranchers, one of whom collected three dozen grooved mauls which he displayed in a washtub that he kept on the back porch of his farmhouse.



-TOP-

SCALE  FOUR INCHES

-FIGURE 10-

24 GA301

Projectile points that are typologically similar to Early Period types have been found on the surface of differentially eroded terraces located along the south side of Reese Creek. A local rancher has at least one Clovis fluted projectile point that he found on the terrace or "bench" adjacent to the Eukes Bison Drive. Similar projectile points are said to have been found in the vicinity of Bozeman, ten miles east of this site.

Future investigation of the Reese Creek locality is to be scheduled.

24 GA 305 Eukes Bison Drive: The term "fall," rather than "jump" (Forbis 1960: 64), is appropriate to this site, since the bison were driven down a steep incline, rather than over a cliff. The Eukes bison fall was excavated by C. A. Kinsey, a reputable collector. Kinsey screened portions of the bone deposit and found several hundred side-notched projectile points.

The stratigraphy of the deposit consisted of an "upper" and "lower" bone layer, separated by a sterile stratum some twelve inches thick that formed during a temporal interval of unknown duration. Most of the projectile points that Kinsey found in the upper layer are triangular-shaped convex-blade concave-base side-notched points made of obsidian. Lower level points are triangular-shaped convex-blade straight-base points made of obsidian, ignimbrite, and

chert. This interesting site has been virtually destroyed by cultivation and the activities of "point hunters."

24 GA 306 Thompson Ranch: Local collectors state that they have found a few artifacts on the Thompson ranch, located south of Bozeman. The Shoshone Indians are said to have camped in this vicinity in historic times. A small occupation site is located on the nearby Renne ranch.

24 GA 307 Pete's Hill Interment: A burial of recent origin was found by two boys who were digging in a small cave located on Pete's Hill, south of Bozeman. The boys reported their find to city officials, and the skeleton was promptly re-interred in the Bozeman cemetery. Years later, the author's father interviewed a man named Neidler, who claimed to have witnessed events connected with the interment.

In 1900, Neidler saw an Indian woman who he knew to be a Bannock, sitting in front of the cave. She was crying, and when he asked her what was wrong, she said she had just buried her daughter in the cave. The Bannock came to this locality every year in order to pick the chokecherries . . .

The author investigated the cave; it was little more than a small recess eroded in a sandstone formation. The deposit was devoid of archaeological material. In 1962, road construction destroyed the hillside on which the cave was situated.

24 GA 308 Valley View: Flakes and artifacts were

found on the summit of Pete's Hill along the fairways of the old Valley View Golf Course. Some of the projectile points may have been fabricated during the Early Period. S-49-1 (Figure 38), made of white Pinyon Quartzite, is heavily ground along the sides of the base. The presence of Early Period artifacts on this site may be attributed to the probability that Pete's Hill is geologically quite stable: glacial melt water carved the face of the hill, creating a mile-wide erosional flood plain in the tertiary valley fill. Sourdough Creek, presently flowing along the base of the hill, was either captured in the ancient erosion channel or is the rejuvenation of a much greater stream. Thus Pete's Hill has maintained its present configuration for a considerable length of time. Additional investigation of this locality would probably result in the discovery of other artifacts indicative of man's early occupation in the Gallatin area.

24 GA 309 Watson Ranch: The Watson Ranch Site is located at the mouth of Kelley Canyon, some five miles west of Bozeman. A small tributary of the East Gallatin River issues from the canyon. This locality is of interest to historians, since Captain Clark, of the Lewis and Clark Expedition, camped here as he followed an Indian trail from the Gallatin Valley to the Yellowstone River valley (Wheeler 1904: 324). Kelley Canyon was an important prehistoric thoroughfare. In this vicinity the drainages of the

Yellowstone and Missouri Rivers are separated by low hills less than a dozen miles wide.

In 1958, a field party under the supervision of Dr. C. I. Malouf examined the Watson Ranch site. Members of the group completed several test pits in a small alluvial fan located at the mouth of Kelley Canyon. A bison skull (probably Bison bison) was found in the A-horizon of test pit I. In test pit II, a single basalt flake was found fifty inches beneath the surface. Other test pits were located on the probable site of Clark's camp, however, nothing was found. The landowner found various artifacts in the plowzone of the site: his collection includes projectile points; a dozen grooved mauls; a few conical pestles; and three cylindrical "roller-shaped" objects, one of which was made of travertine (Figure 26). Most of the projectile points in his collection are corner-notched types made of materials that were probably obtained in the immediate vicinity of the site.

24 GA 310 Kelley Canyon: The Kelley Canyon occupation site is located one mile east of the Watson site, on an area formed by the intersection of a small spring and Kelley Creek. The Indian trail that Clark followed to the Yellowstone River crossed the northern extremity of this site.

Members of the field party collected three types of projectile points; triangular corner-notched points, shallow

corner-notched points, and stemmed "Hanna" points (Figure 11). Mauls, pestles, and cylindrical implements found at the Watson site, located one mile west, were not represented in the material culture of the Kelley Canyon site (Figure 12). There is not much difference between the projectile points of the Watson and Kelley Canyon sites, so it may be that the absence of pestles, mauls, and similar implements is due to frequent visits to the sites by collectors from Bozeman, however, this explanation may be entirely too facile. Chokecherry brush, not present in the immediate vicinity of this site, grows near the Watson site. It is possible that the presence or absence of such implements in the respective material cultures may reflect this ecological variation. The author admits to the uncertainty in comparing collections from these surface sites, since relic collectors may have drastically altered the respective artifact inventories. Comparison between the material cultures would be much more valid had all of the artifacts been obtained from a sub-surface context.

Projectile points: (1). The notches of the corner-notched points found on the Kelley Canyon site are acute and narrow, usually three times as deep as they are wide. These points are lenticular in cross-section, pressure flaked, and are often made of crypto-crystalline materials. (2). Shallow corner-notched projectile points are three times as long as they are wide. The notches are wide but quite shallow.

Most of the specimens are made of basalt (Figure 11, numbers 6, 7, and 8). This projectile point type seems to be one of the oldest found in Montana bison drives: comparable specimens have been found in the lowest levels of the Madison Drive (24 GA 314), the Crater Drive (Napton 1964b, Figure 1 and Photo 11, Specimens 3 and 4; Cf. Neuman 1965: 299), and the Story Bison Drive (24 PA 309) (Arthur 1962: 21, Figure 1, No. 1). (3). Stemmed points found on the Kelley Canyon site resemble Hanna points (Wheeler 1954: 7-14; Wedel 1961: 251, Figure 22, right). Points of this type are common in the Montana Western Region (Malouf 1960: 9), and in the Beaverhead Valley, located in the Montana Southwestern Sub-Region (Napton 1957, Field Notes).

Two blue trade beads were found in the plowzone of the Kelley Canyon site. Similar beads were obtained by the Indians from the American Fur Company: these specimens could not have been deposited on the site prior to 1830. Several forty and fifty caliber center-fire cartridges were found intermixed with archaeological material.

The Kelly Canyon site represents an excellent example of serial occupation: on the surface, or within the single cultural stratum of the site, are found stemmed projectile points, corner-notched projectile points, Emigrant points, and rifle cartridges.

24 GA 311 Hot Springs Bison Drive: This site is one

of three bison falls known to be located in the Gallatin area. The animals were driven down the steeply-inclined slope of an eroded terrace. This small site has but two interesting features: the very moderate height of the drive terrace, and the remains of a semi-circular stone compound that enclosed the drive deposit.

Since the drive terrace is less than thirty feet high (and the eroded slope is not particularly steep) the bison probably were not killed or injured as a direct consequence of having been driven down the incline. The Indians had to devise a means of delaying the bison, so the hunters could make effective use of their arrows. They solved this problem by erecting a compound or enclosure around the base of the drive terrace. The compound was formed of approximately ten stone cairns placed some fifteen feet apart. These stones might have supported a barrier made of brush or logs (Wissler 1910: 36).

Several hundred side-notched projectile points have been screened from the burned bone and earth in the site deposit. Residents of Bozeman possess more than 300 projectile points taken from this site, and at least 118 intact specimens were collected by C. A. Kinsey (Plate I, Photo I). His specimens are composed of the following materials:

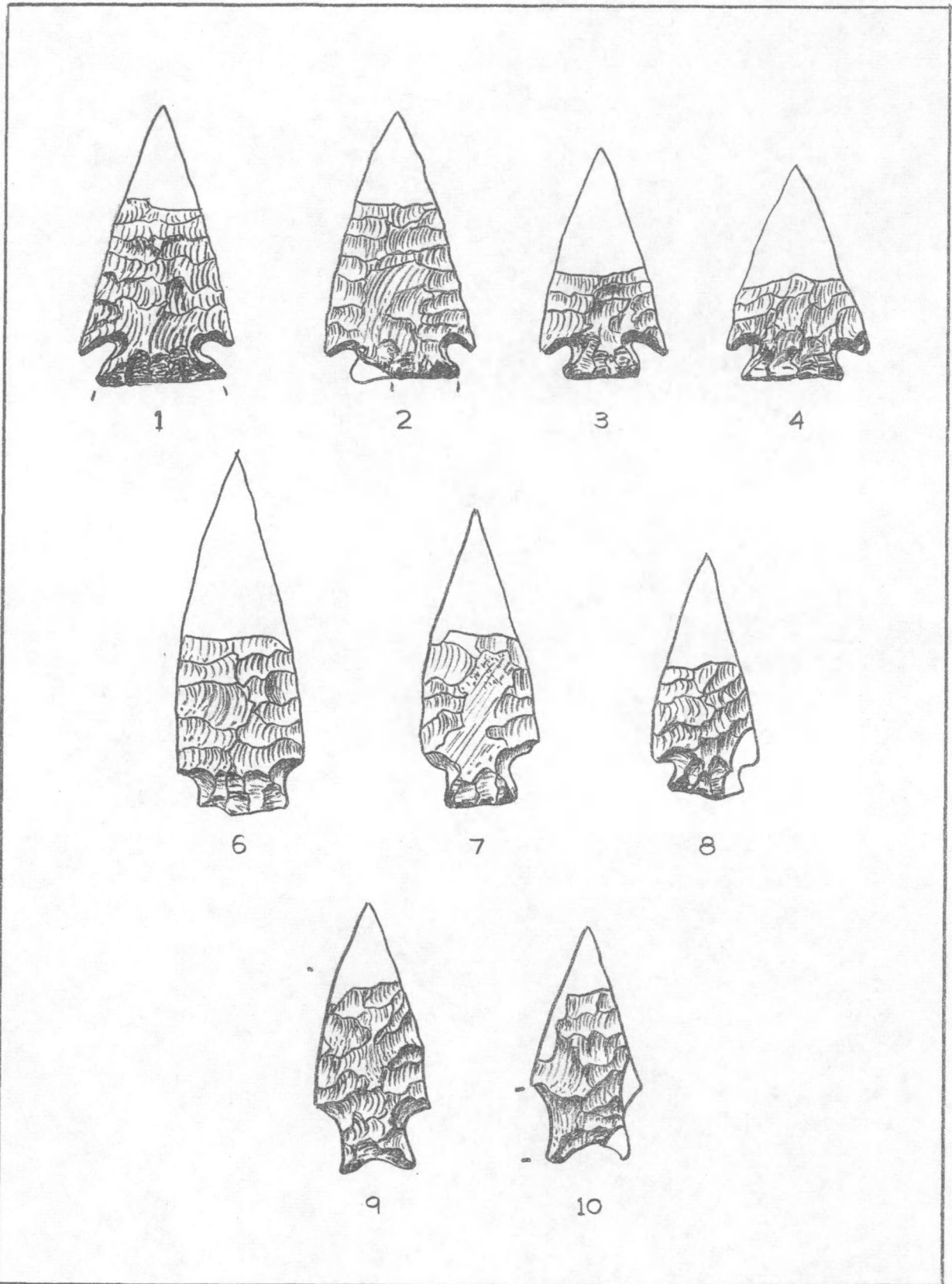
Obsidian	66	56%
Basalt	26	22%
Chert, Agate	26	22%
	<u>(118)</u>	<u>(100%)</u>

Figure 1124 GA 310 (S-44)

1. Type 17, black CY
2. Type 17, yellow CY
3. Type 17, black obsidian
4. Type 17, black obsidian
6. Type 12, basalt
7. Type 12, basalt
8. Type 12, black obsidian
9. Type 10, red jasper
10. Type 10, yellow CY

Figure 1224 GA 310 (S-44)

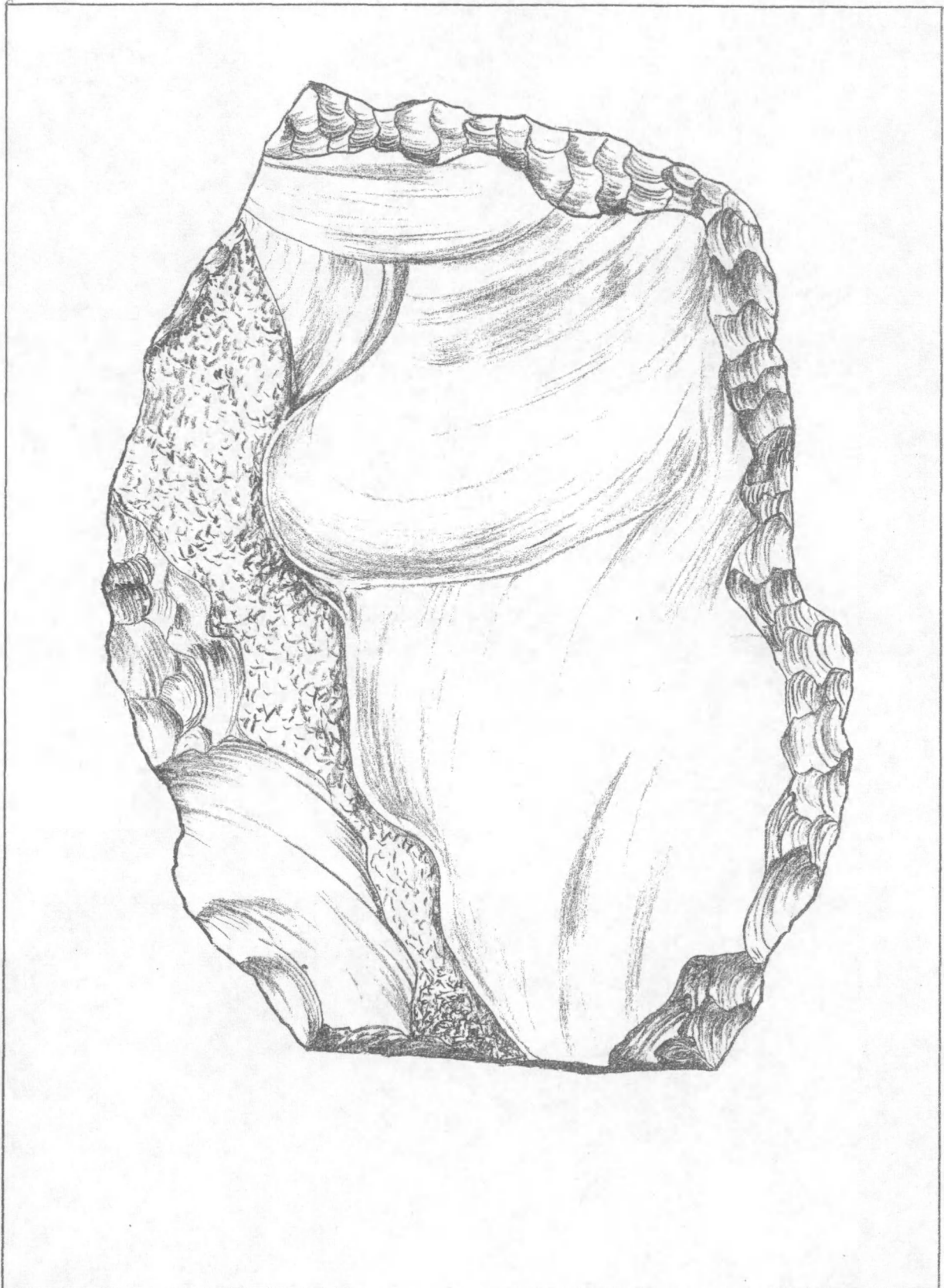
1. Scraper, Type S, basalt



INCH

24 GA 310

- FIGURE 11 -



INCH

- FIGURE 12 -

24GA310

Approximately seventy-five percent of these projectile points are composed of igneous materials. Kinsey's sample includes only selected, undamaged points. Nevertheless, other projectile point collections obtained from the site confirm the high ratio of igneous materials. The significance of this ratio is discussed in Chapter VIII of this study.

The quantity of projectile points found in the site deposit is a direct function of the low contour of the drive terrace. Perhaps few, if any, bison were killed by the fall. Arrows were used to dispatch the bison contained within the compound.

Certain features of the site, such as the uniform style of the projectile points, the well-preserved bison bones, and the sophisticated design of the drive suggest that the site was used rather recently--perhaps during the Historic Period. Successful operation of bison falls probably required a high degree of organization and planning. The ramifications of this observation will be discussed in Chapter VII-I.

24 GA 313 Camp Creek: Camp Creek, a minor tributary of the West Gallatin River, has cut a deep channel through the alluvial floodplain of a small canyon located near Ancencey, Montana. Numerous bones were exposed in the eroded channel walls or "cutbanks." The field party

designated one of the cutbanks located on the south side of the creek as "Exposure One." A bison horn core protruded from the Exposure One cutbank at a depth of eight feet seven inches beneath the surface. A bison scapula, two ribs, and a few post-cranial bone fragments lay horizontally at the same depth in a moist grey-clay stratum. A basalt flake (S-103-13) was found in situ in the grey clay three feet west of the faunal remains. The flake does not appear to have been retouched (Figure 13). The overlying B-horizon strata consist of cross-bedded indurated clay and unconsolidated reworked alluvial sand and gravel. The thickness of the overburden implies that some antiquity might be ascribed to the faunal material, however, none of the bones appear to be particularly ancient. Cultural features were absent in the extensive stratigraphic section displayed along Exposure One.

Five hundred yards upstream, east of Exposure One, is a similar eroded bank, given the field designation "Exposure Two." A bison mandible, assorted post-cranial fragments, and two large bison teeth projected from the bank at a depth of eighteen inches beneath the surface.

A single black obsidian flake (S-103-14), found in situ at the same depth as the faunal material, exhibits secondary retouching along one edge, the surface of which subsequently accumulated a slight patina.

Two projectile points (S-103-7 and 15) were found on the eroded surface of a secondary stream terrace located

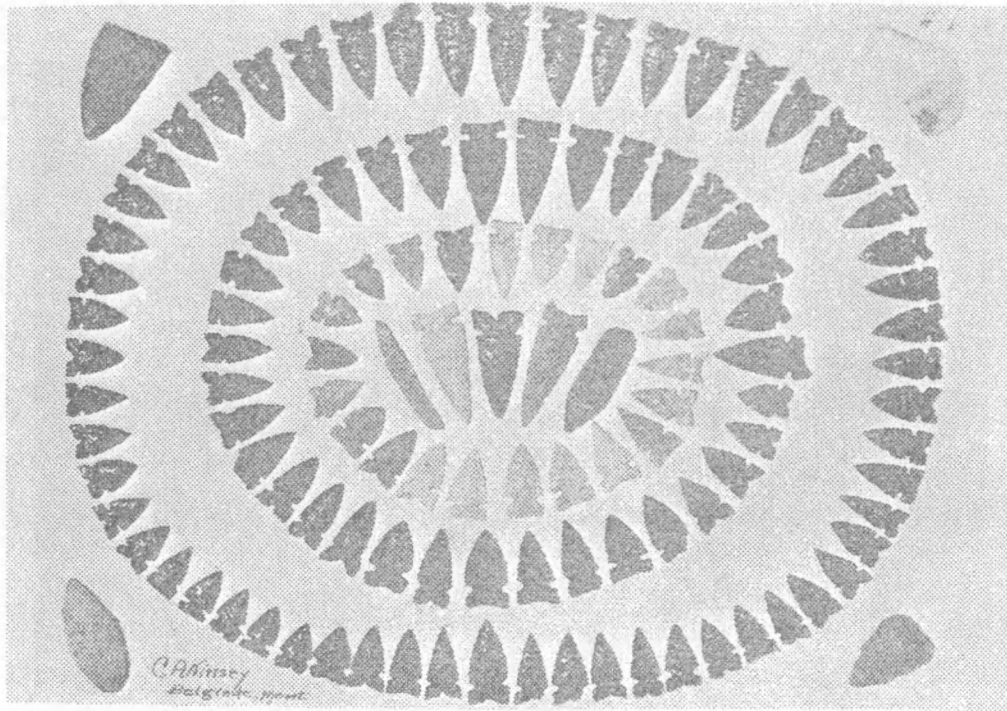


Photo 1. 24 GA 311: Kinsey collection projectile points. Longest specimen two inches. Photograph: C. A. Kinsey.

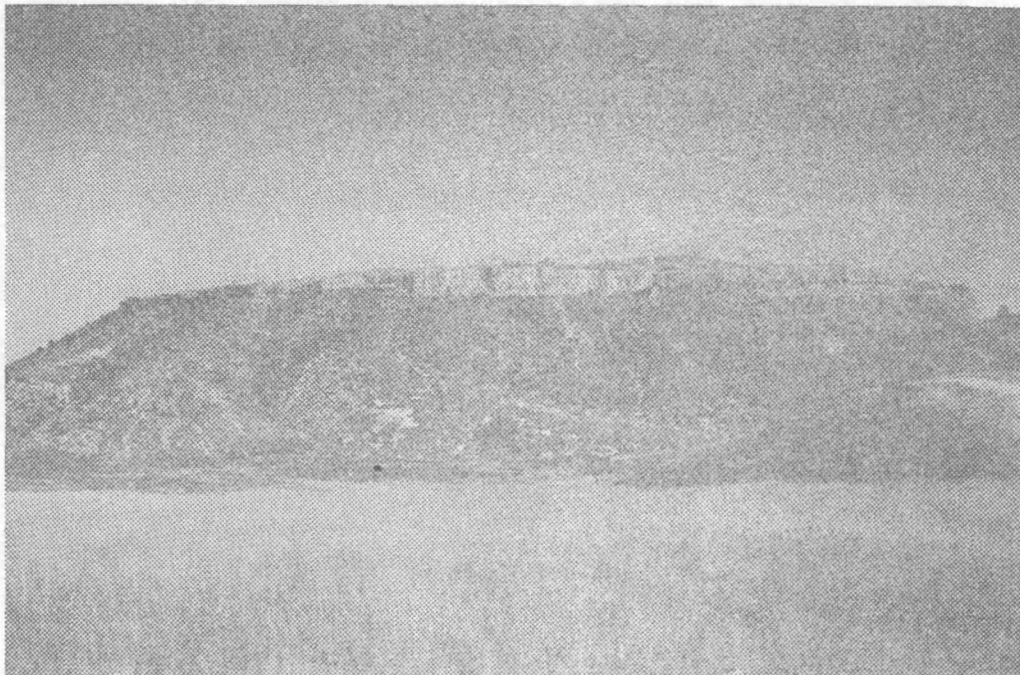


Photo 2. 24 GA 314: Madison Bison Drive, looking east from Kinsey Gulch to the drive deposit. Photo taken in 1948.

north of the creek. These specimens resemble McKean projectile points (Figure 13). McKean points have been reported found in Wyoming (Mulloy 1954: 432-60), but are not common in the Gallatin area. S-103-7 resembles a specimen illustrated by Mulloy (1954: 446, Figure 4, Lower Level, specimen number five). Two corner-notched projectile points (Figure 13; S-103-8 and S-103-9) were also found on the eroded surface of the terrace.

24 GA 314 Madison Bison Drive: The author was able to investigate part of the archaeological resources of the Madison Bison Drive before the site was extensively vandalized. The unprotected drive deposit suffered considerable damage during the years following World War Two. Relic collectors have destroyed many important features of this site.

Physiography: The lower Madison River valley is a wide alluvial floodplain flanked on the east and west by a series of paired escarpments. The high eastern escarpment marks the termination of the gently undulating surface of the Gallatin Valley. One of the peninsula-like prominences of this escarpment forms the "drive plateau" of the Madison Bison Drive. The plateau is capped by a thick sandstone formation, the highest portion of which was used as the "drive cliff" (Plate I, Photo 2). This formation dips to the east and unconformably overlies strata composed of

Figure 1324 GA 312 (S-7)

1. Type 9, tan chert

13. Flake, basalt

14. Retouched flake, black ignimbrite

8. Type 18, basalt

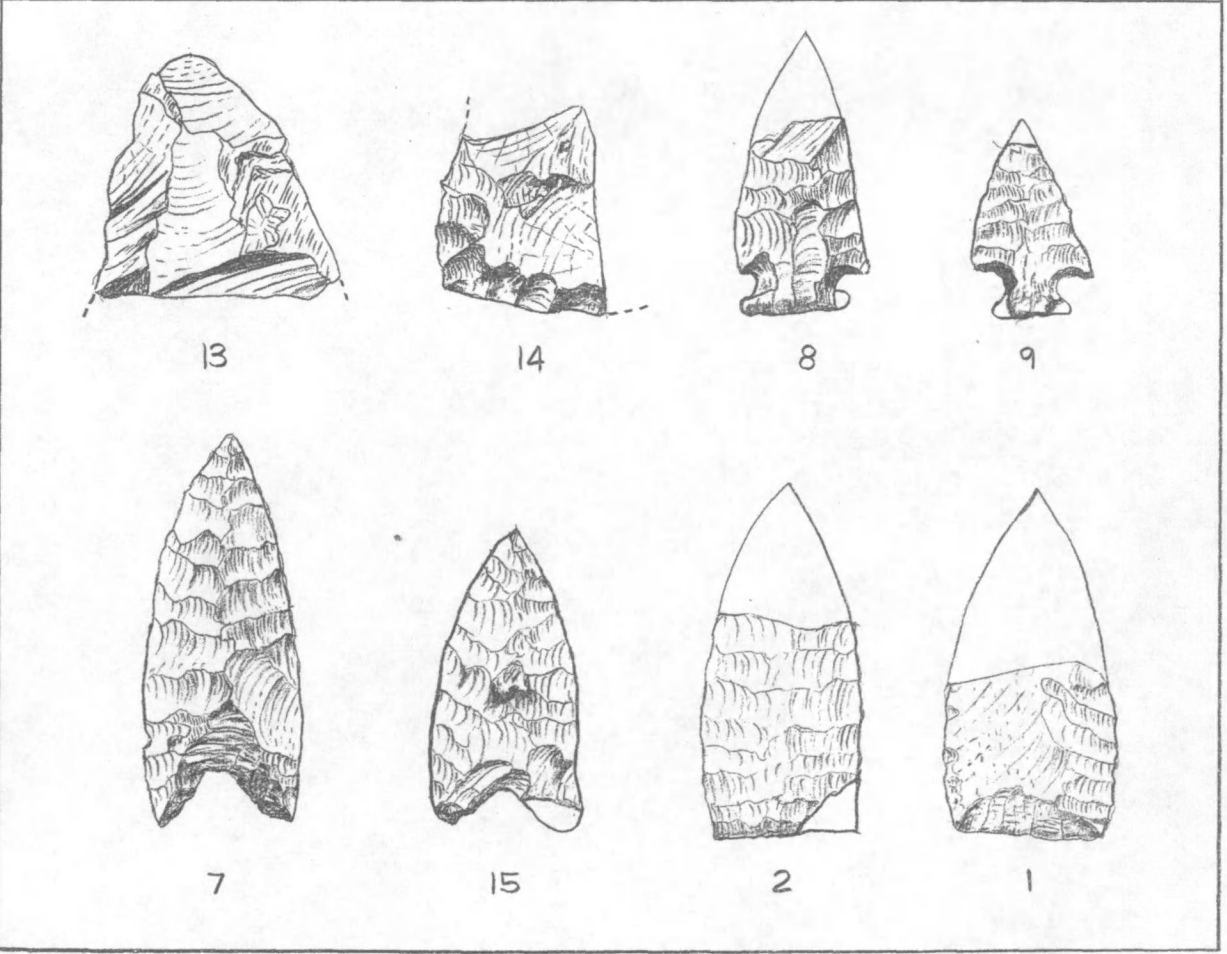
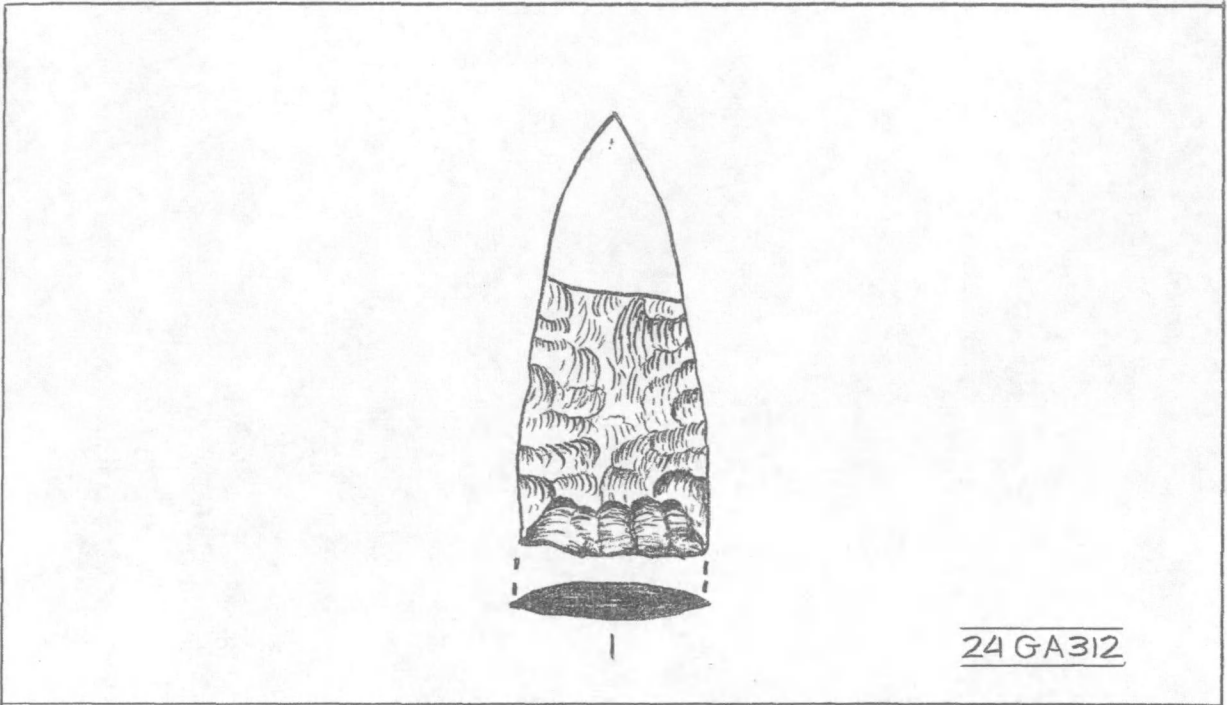
9. Type 14, basalt

7. Type 7, white chert

15. Type 7, basalt

2. Type 2, white agate

1. Type 2, brown CY



INCH

24 GA313

- FIGURE 13 -

shale and conglomerate. Deep west-sloping canyons extend north and south of the drive plateau (Figure 14). Most of the geographical features of the drive plateau are duplicated along the Madison escarpment; thus, the location of the drive was determined by the following unique features.

Drive Features: Traces of a bison trail are visible on the summit of the drive plateau. Fortunately, the drive plateau has not been plowed, although the Gallatin Valley wheat fields extend almost to the rim of the escarpment. The bison trail descends the north flank of the drive plateau (Figure 14), continues east across the Madison River floodplain, and ascends the western escarpment. The fortuitous proximity of the trail and the drive cliff presented the Indians with a simple problem in hunting tactics. They had only to divert the bison from the trail and drive them approximately 300 yards to the most precipitous portion of the drive cliff. The bison jumped, fell some fifty feet, and rolled or slid a distance of 200 yards down the steep slope of the drive plateau.

Among the prominent features located on the summit of the drive plateau are two "drive lines" comparable to those associated with most bison drives. The drive lines may have functioned as barriers that served to guide the animals to the drive cliff. The north drive line is composed of eight small conical cairns made of pieces of conglomerate; the



-FIGURE 14-

south drive line consists of but two cairns. These particular drive lines were superfluous in view of the peninsular shape of the drive plateau; they certainly could not have been very effective barriers--yet they might have served an important ritual function.

Summit stone circles: There are six stone circles on the summit of the drive plateau. The function of these particular circles is not evident, however, they are situated in the path of the bison trail. In size, shape, and general appearance they resemble stone circles frequently identified as "tipi rings." When the author observed and photographed these constructions in 1944, they were intact, but they have long since been vandalized. Each circle consisted of an average of thirty stones placed approximately eighteen to twenty-four inches apart, forming circles averaging thirteen feet in diameter. Very little cultural material was found in the vicinity of these circles. Since relic collectors have thoroughly examined the entire site, the lack of lithic specimens is not surprising.

Drive Deposit: An extensive bone deposit is located immediately beneath the highest portion of the drive cliff. The deposit extends more than 200 yards down the steep slope of the drive plateau. Most of the deposit is a chaos of pits and trenches dug by relic hunters. The site surface is covered by a rank growth of rye grass. In early spring this

grass becomes extremely green, a phenomenon attributable to the extensive fertilization provided by the decayed bison remains. Forbis (1962: 51) states "in some cases there is a distinctive grass . . . and you can pick it out from aerial photographs." The author is uncertain whether the occurrence of the grass owes to the high fertility of the soil, or to the possibility that the bison carried rye-grass seed in their digestive tracts. This distinctive grass does not grow on the surface of some of the drive sites found in the Gallatin area.

The strata of the bone deposit vary in depth. A layer of bone located immediately beneath the drive cliff is less than one foot thick. Fifty yards west, at the location of Test Pit I, dug in 1958 by a field crew supervised by Carling Malouf, the same bone layer is approximately eighteen to twenty-four inches thick.

Test Pit Number I was useful in determining the depth and composition of the deposit: there are at least three strata containing massive accumulations of bison bone. Each gross "bone stratum" is twelve to eighteen inches thick. Between the bone strata are sand layers six to twelve inches thick. These relatively sterile layers are composed of slope-wash and aeolian sand. Five feet beneath the surface of the drive deposit is a dense sand layer that seems to be completely devoid of faunal remains (Figure 15).

Seven articulated vertebrae and fragments of three

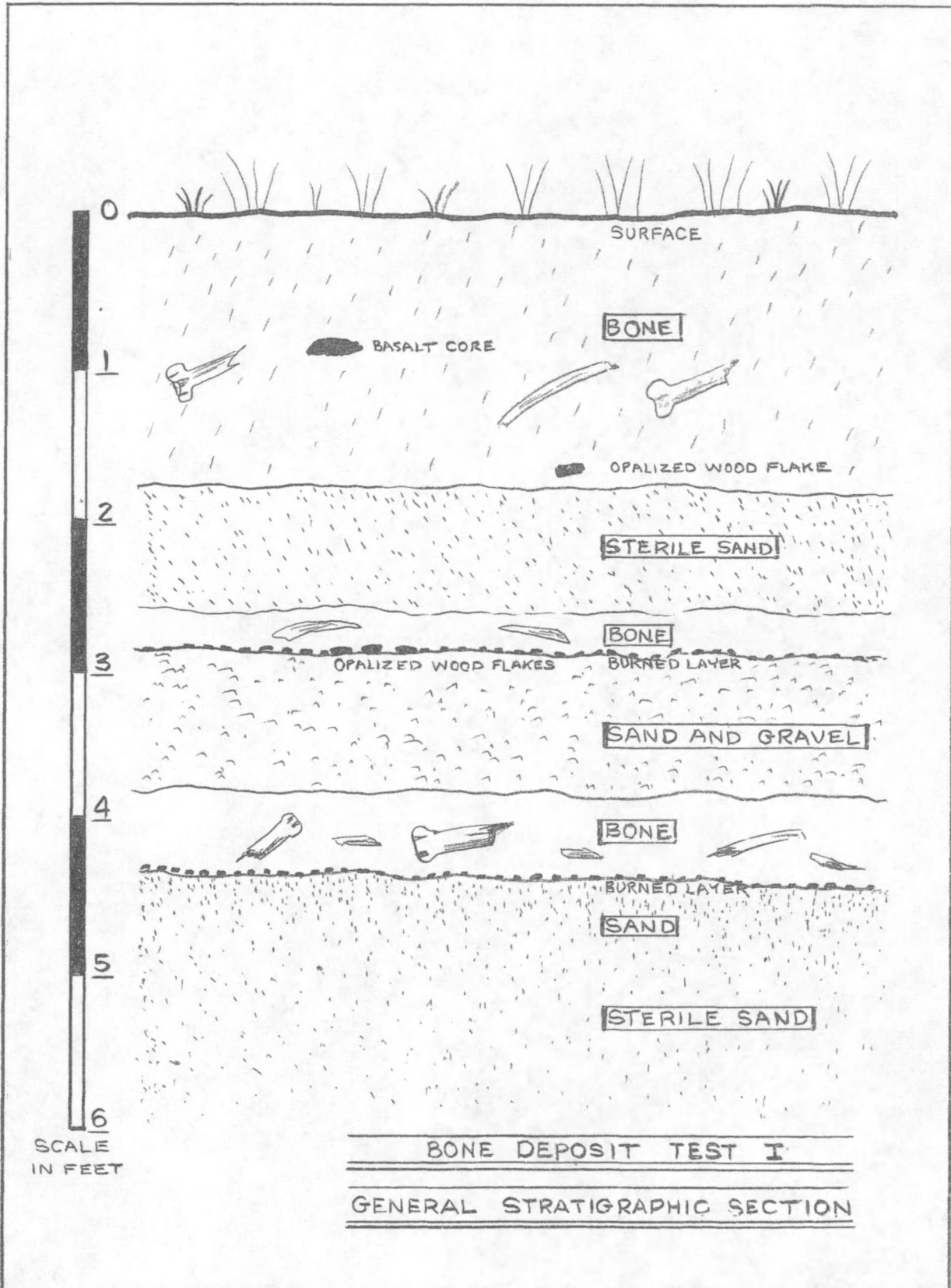
bison skulls were found in Test Pit I. Most of the disarticulated bones found in the test pit were shattered. Perhaps this represents traumatic breakage. On the other hand, experiments conducted by the author indicate that frost action causes a considerable amount of breakage.

The Madison Drive plateau is one of the highest of the known bison drives. It is likely that most of the bison driven over the cliff died as a result of injuries sustained upon impact. The Indians had to kill only a few survivors, consequently, compared to fall sites such as the Hot Springs Drive (24 GA 311), there were very few projectile points in the drive deposit. The author found six; a single point was found in Test Pit I; however, C. A. Kinsey found dozens of projectile points. Malouf (1962: 14) remarks that

Kinsey . . . dug a few feet away . . . from our pit 1 and he claimed to have found a large variety of points in it. Why our yield was so low is unexplained.

Judging from Kinsey's photographs, his major excavation was more than thirty feet square. Kinsey informed the author that he found two distinct bone layers: an "upper" layer two feet thick, and a "lower" layer some three to five feet thick. Each layer contained side-notched projectile points. Kinsey also discovered a "bottom" layer, as he called it, which contained fragments of projectile points larger than those found in the overlying layers. Several of the projectile points that Kinsey attributed to the upper layers are

illustrated in this study (Figure 16). These side-notched projectile points are often found in drives that antedate bison fall sites such as the Hot Springs Drive. (This inference is based on differences in projectile point styles, rather than on absolute dating: most of the Hot Springs Drive points are side-notched base-notched types that are probably more recent than the straight-base side-notched points found in the Madison Drive.) Kinsey found several broken projectile points in the bottom layer of the Madison Drive. These are illustrated in Figure 16. Also sketched in Figure 16 are two projectile points displayed in the Roy Austin collection. Austin stated that he found these specimens at a depth of six and one-half to seven and one-half feet beneath the surface. Unfortunately, neither Kinsey or Austin found complete specimens in the bottom layer of the Madison Drive. Kinsey's specimens consist of nine broken distal fragments which, even though incomplete, display attributes that obviously contrast the small triangular or convex-blade side-notched points that are usually found in bison drives in the Montana Southwestern Sub-Region. When Kinsey found these specimens in the lowest level of the drive deposit, he correctly assumed that they were older than the side-notched types found in the overlying layers. These specimens may represent one of the older types of projectile points found in the bison drives located in Montana (Figure 16). Malouf (1962: 14) states that some of Kinsey's



24 GA314

-FIGURE 15-

finds

could typologically be dated back to early Forager times, not more than 4,000 years ago . . . the site was used over at least two or three thousand years.

The Madison Bison Drive has every appearance of being an old site. According to Bliss, "the evidence that has accumulated indicates [that the oldest bison drives] are not more than about 2,500 years old." The oldest reported bison drive dated by radiocarbon is located at Lance Creek, Wyoming. This is dated "roughly 2,500 years ago (300 B.C.)" (Bliss 1962: 11).

The author obtained from the Madison Drive deposit carbonized material suitable for radiocarbon dating. A series of samples, collected at twenty centimeter intervals, were taken from the exposed east profile of Test Pit I. Financial considerations have impeded analysis of the samples, although the material is suitable for the radiocarbon method (Oakley, personal communication, June 1965).

Uncontrolled digging has ruined most of the Madison Drive deposit, however, the few remaining undisturbed sections could at least provide additional samples of faunal material. In addition, it might be possible to recover complete samples of the projectile points similar to those found by C. A. Kinsey in the lower levels of the deposit.

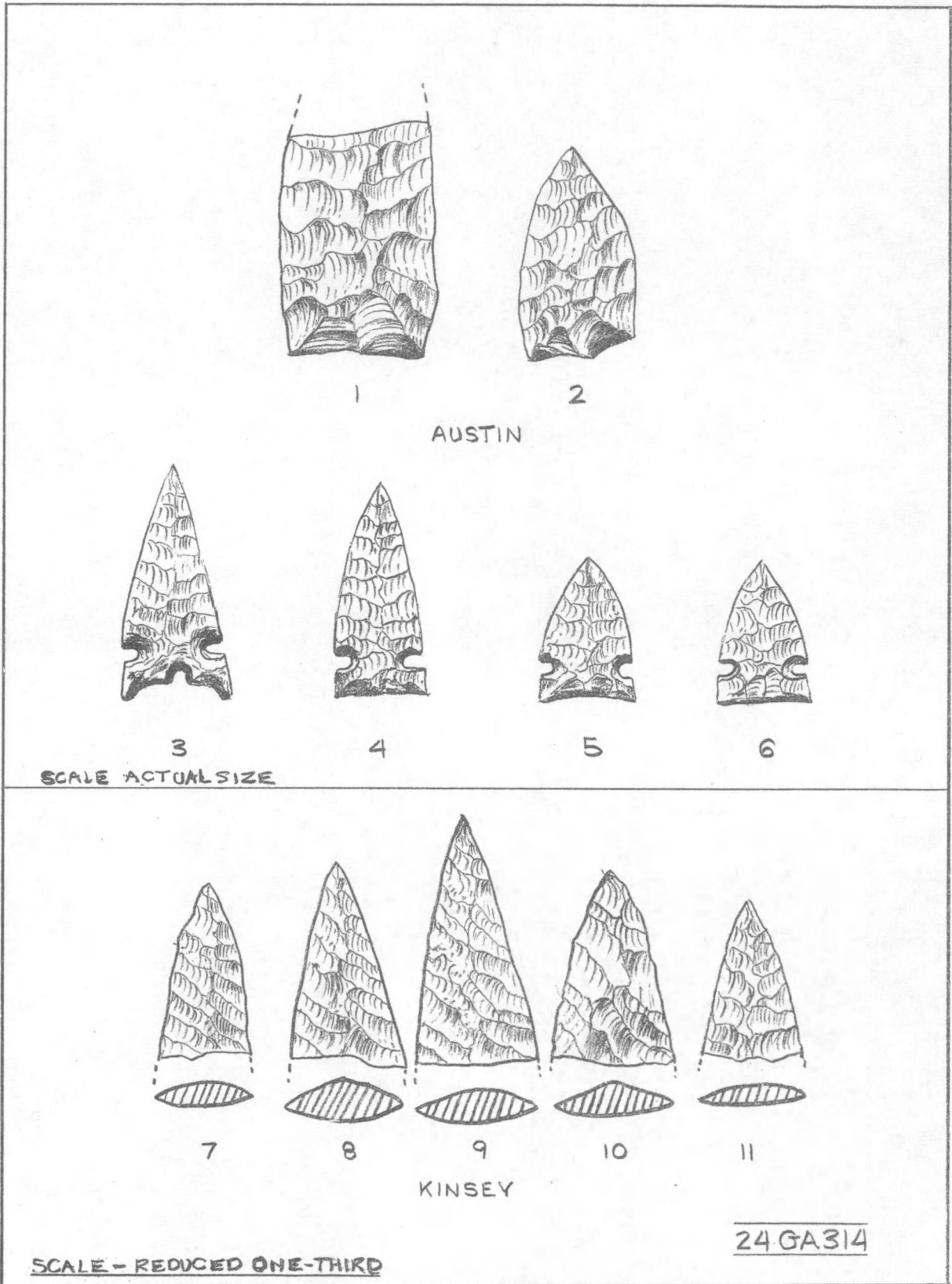
Occupation site: An occupation site lies along either side of "Kinsey Gulch," a sheltered draw located some

Figure 1624 GA 314 (S-45)

-
1. Type 2, Basalt
 2. Type 2, Basalt

-
3. Type 23, Black Obsidian
 4. Type 21, Material unknown
 5. Type 22, Material unknown
 6. Type 21, Material unknown

-
7. Type 12, Kinsey Collection, Material unknown
 8. Type 12, Kinsey Collection, Material unknown
 9. Type 12, Kinsey Collection, Material unknown
 10. Type 12, Kinsey Collection, Material unknown
 11. Type 12, Kinsey Collection, Material unknown
-



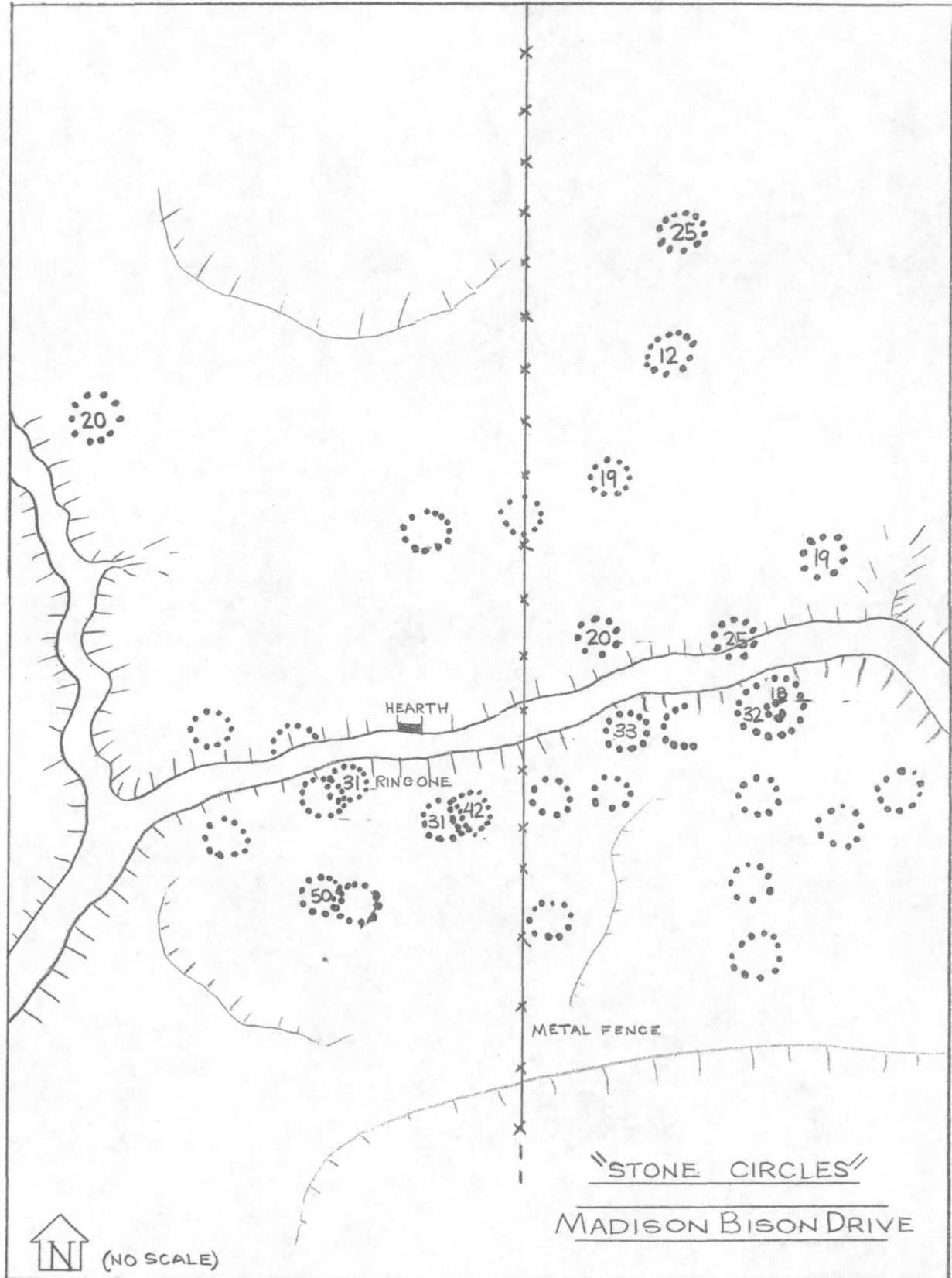
INCH

- FIGURE 16 -

500 feet west of the drive deposit (Figure 17). On the surface of the site are numerous stone circles. A few hardy junipers grow along the banks of the gulch. There are no sources of water near the site at the present time, since the gulch is dry, except for seasonal melt-water, and the Madison River is located more than two miles west of the site. The possibility that water was available only during the spring and autumn might imply that the site was occupied only during those seasons.

Many investigators, including the author, have assumed that the spatially associated occupation site and bison drive are culturally and temporally coeval. Some observers believe that the stone circles and the associated occupational debris represent a single cultural manifestation. In order to test the validity of this assumption, the author in 1949 excavated one of the stone circles, which was given the field designation "Ring One." This circle was a double-course construction approximately twelve feet in diameter. It was partially overlapped by another circle of comparable size. Self-admitted authorities of Indian lore explain that overlapping rings or circles mark the location of "double" or connected tipis.

The test excavation, five feet wide and fifteen feet long, was confined to the six-inch thick A-horizon strata. This zone was unconformably imposed on a B-horizon strata consisting of fine-grain sand and grey clay. Artifacts,



-FIGURE 17-

24GA314

flakes, and fragments of bone were found both inside and outside the confines of the stone circle, but the distribution of the cultural material did not seem to relate to the superimposed alignment.

Few artifacts were found in the test pit (Figure 38, S-45-5), but the flake sample indicates that considerable use was made of opalized wood obtained in the immediate vicinity of this site. A great many very small fragments of unburned bone were found in the test pit: these fragments suggest that "initial" butchering was completed at the drive deposit, and portions of the bison were carried to the occupation sites, where "final" butchering was performed (Cf. Lehmer 1954: 146).

The author mapped the stone circles. In the event that the Madison Drive becomes a state park, these features could be reconstructed. Large scale maps made in August, 1950, were supplemented by additional survey completed in January, 1957. A relic hunter who was a resident of Bozeman is responsible for the destruction of most of the stone circles.

In 1958, the author discovered and excavated two fire hearths that were exposed in the rapidly eroding cut-bank extending along Kinsey Gulch. The hearths were not associated with any of the stone circles. The upper hearth was situated twelve inches beneath the surface; another was approximately six inches deeper. The superimposition

indicates that there were at least two periods of occupation, separated by a temporal interval of unknown duration. Fragments of burned bone and a few flakes were found in both hearths. The underlying soil was red, contrasting the tan hue of the A-2 horizon soil. Mulloy (1959: 13) states that the hearths at the Jimmy Allen site "to judge from the degree of reddening of the underlying soil, must have been maintained for a considerable period of time." It is likely that the type of soil, as well as the type of fuel used to maintain the fires, contributed to the discoloration of the soil beneath the hearths.

Ceramics: In 1960, members of the Montana Archaeological Society found fragments of pottery in the A-horizon strata of the occupation site. Malouf (1962: 13) mentions that "simple potsherds were found to attest to the recency of the occupation of this area." A reputable collector found five diminutive potsherds at a depth of twelve inches beneath the surface in a test pit located some 200 yards northeast of Kinsey Gulch. Spectroscopic analysis of one of these fragments failed to demonstrate significant differences among the test sherd, Mandan-Hidatsa ware, or Intermountain Flatbottom ware. Thus, the cultural affiliation of the sherds found at the Madison Drive remains unknown. The sherds found by members of the Montana Archaeological Society have not been studied, but Malouf (1962: 46) has

stated that

four potsherds were found by the Montana Archaeological Society . . . there were no bottom or rim pieces so they were rather indecisive as to where they go in the cultural horizons.

European or post-contact trade goods have not been reported found in the occupation site, but the potsherds could indicate that the site was occupied during the Late Period, or perhaps early in the Historic Period, since pottery is believed to be "recent" in the Montana Southwestern Sub-Region.

The author's initial investigation of the archaeological resources of the Madison Bison Drive included mapping the stone circles, excavating one of the circles, testing the two firehearths, and photographing many features that have since been destroyed. This data remains available for the benefit of those who are striving to preserve the site as a state park. The Madison Bison Drive is an important site that could produce valuable information pertaining to the development of the bison-drive complex.

This concludes description of the archaeological sites found in the central Gallatin Valley. The following sites are located in the Gallatin Canyon and adjacent mountain ranges.

24 GA 315 Chisholm Site: The Chisholm occupation site is situated in a deep, rather narrow glacially-carved canyon drained by Hyalite Creek, a steeply aggrading tributary of the Gallatin River. Hyalite Creek is typical of many of the secondary canyons located in the mountainous portions of the survey area. When the author's parents discovered the Chisholm site on October 17, 1948, it had been exposed--and virtually destroyed--by Caterpillar tractors engaged in removing pine trees growing in the collection basin of Hyalite dam. Located near the confluence of Hyalite Creek and a small tributary stream, the site was originally flanked by a dense stand of lodgepole pine. Photographs taken of the locality in 1925 depict a parklike glen that was probably virtually unchanged since the Indians occupied the locality.

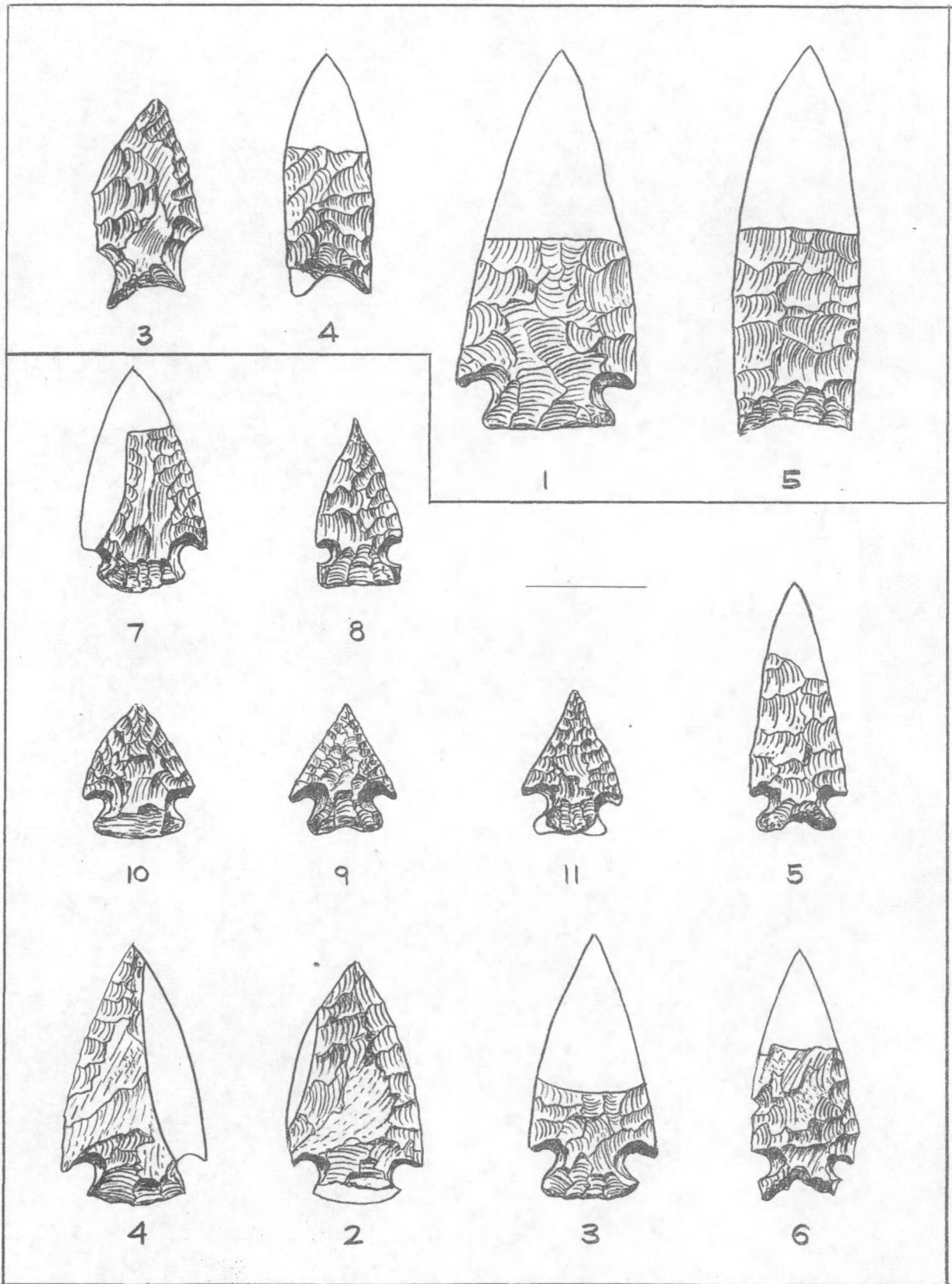
The cultural material originally lay three to five inches beneath the surface in a podzol A-horizon. Three types of projectile points were found in the exposed soil (Figure 18). One type is represented by a single side-notched projectile point (S-43-8). Some of the specimens are perhaps variants of a basic corner-notched type. S-43-4 seems to be similar to drawings of projectile points found at the Keaster Site (Davis and Stallcop 1965: 21, Pl. 3). The lithic material was probably obtained from glacial till exposed along the nearby creeks. The artifacts seem to have been made from local materials. A significant exception to

Figure 1824 GA 315 (S-48)

-
3. Type 10, black ignimbrite
 4. Type 7, jasper
 1. Type 15, brown CY
 5. Type 2, white quartzite

24 GA 316 (S-43)

-
7. Type 16, brn-red jasper
 8. Type 18, blk CY
-
10. Type 16, grey chert
 9. Type 13, red jasper
 11. Type 13, chert
 5. Type 13, white chert
-
4. Type 16,
 2. Type 16, white chert
 3. Type 16, tan chert
 6. Type 13, white chert
-



SCALE | ACTUAL SIZE

- FIGURE 18 -

UPPER INSET 24GA316
LOWER 24GA315

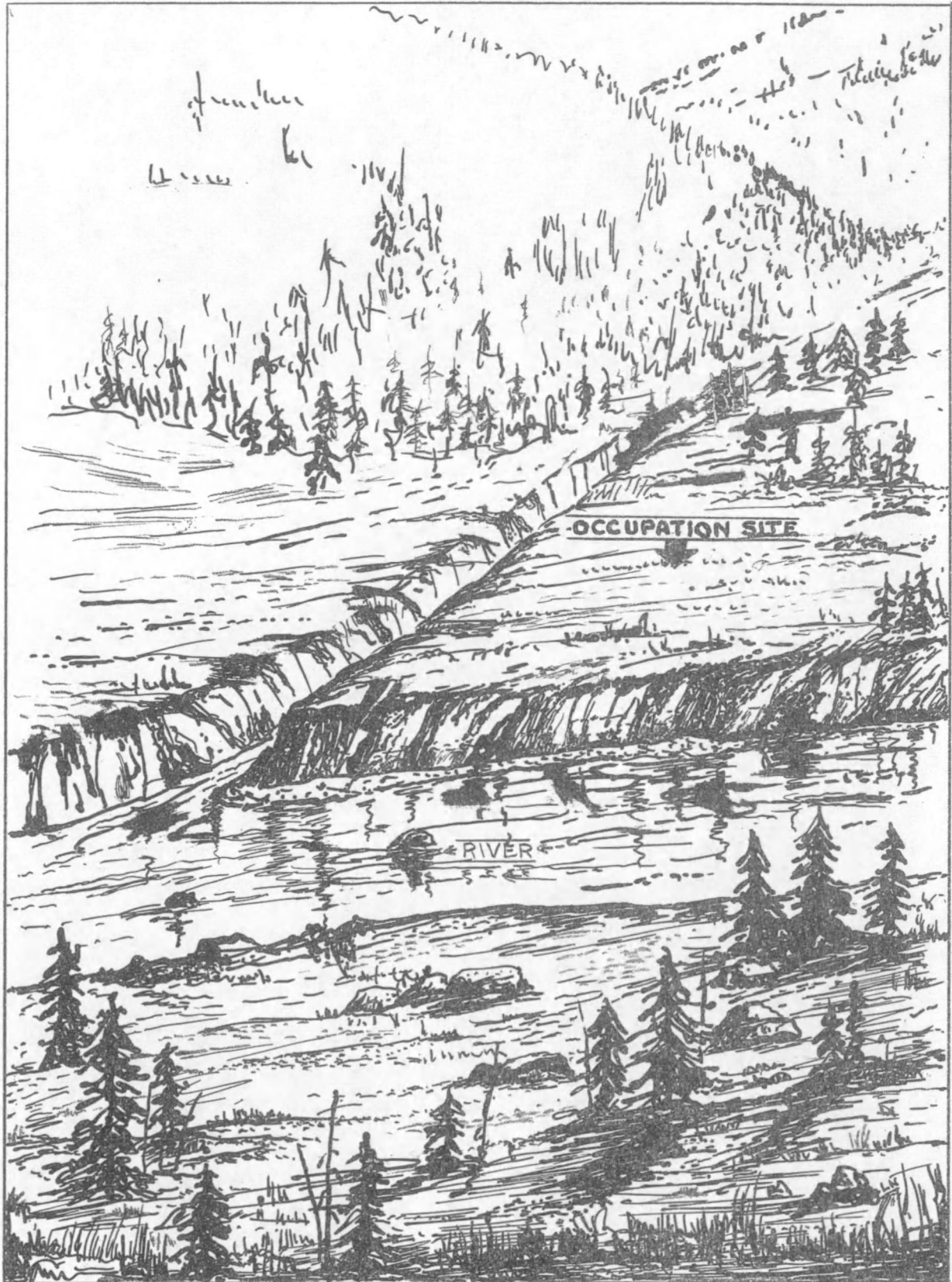
this generalization is a large well-flaked knife made of black ignimbrite (Figure 38, S-43-1). This specimen is an anomaly, since ignimbrite flakes were not found on the site. It is the index specimen of a type that the author has tentatively named "Beveled-edge Knives." (Listed in this study as Knife Type One.) A similar knife (S-145-1) found on the West Fork of the Gallatin River, resembles the Chisholm site specimen so closely that one might suspect both artifacts had been flaked by the same individual.

All of the projectile points, artifacts, and flakes were salvaged from disturbed soil. The site, now totally destroyed, probably represents a serially occupied hunting camp.

Gallatin Canyon

24 GA 312 Greek Creek: This occupation site is illustrated (Figure 19) as a typical example of the smaller occupation sites found in the Gallatin Canyon. It is located on the primary river terrace within the angle of intersection formed by the confluence of Greek Creek and the West Gallatin River. Thus, the site is said to be located "inside" the confluence of the mainstream and its tributary. Cultural material found on the same river terrace, but downstream from the confluence, is said to be located "outside" the confluence.

Members of the survey party found a few flakes and



"TYPICAL" OCCUPATION SITE

24GA312

one artifact (Figure 13) which resembles specimens found at Beaver Creek (24 GA 319) located seven miles south of this site. The lithic sample probably constitutes about ninety percent of the material culture of this small site. In 1953, the locality was destroyed during reconstruction of U.S. Highway 191.

24 GA 316 Squaw Creek: An extensive quarry and occupation site is located in a small meadow on the north bank of Squaw Creek. The site is some eight miles east of the confluence of the creek and the Gallatin River. In the center of the occupation area is a large monolith composed of red jasper and brown chert. Artifacts, cores, and fortuitous flakes of these materials litter the site surface.

The location of the Squaw Creek site has been known to residents of Bozeman since 1930 (Palfy, personal communication, 1950). Some of the relic hunters who visited the site collected only projectile points, leaving behind a residual, grossly distorted artifact inventory consisting of broken knives and cores.

Members of the field party found a half-dozen projectile points: S-48-1 and S-48-2 are corner-notched points, S-48-3 resembles "Hanna" projectile points, S-48-4 and 5 may be Early Period types. The latter is a "side-ground" type (Figure 18). Side-notched projectile points were absent. Among the implements found on the site surface were thirty

broken oval knives, all of which were made of locally quarried red jasper and brown chert. The flake sample was virtually limited to these materials. There were only a few small flakes of obsidian, basalt, and quartzite.

Two blue beads found on the site surface constitute the only trade or post-contact items that the survey party found in the Gallatin Canyon. The paucity of side-notched projectile points and post-contact trade goods in the Gallatin Canyon may indicate diminished occupation in the canyon during the Late and Historic Periods. This possibility, corroborated by evidence from other sites, is discussed in Chapter VIII.

24 GA 317 Moose Creek: The tabular surface of a secondary stream terrace located inside the confluence of Moose Creek and the Gallatin River served as an occupation site. Part of the site adjacent to the river was destroyed during the initial construction of the Gallatin Canyon road. In 1953, the road was widened in the vicinity of Moose Creek.

Highway survey markers indicated that the remaining undisturbed portion of the site was to be destroyed. Working immediately in advance of the highway construction machinery, the author completed seven test pits and salvaged a quantity of surface material. The test pits may represent one of the first "highway salvage" archaeological projects

conducted in Montana. However, the author has not completed his study of this site.

The stratigraphy of the Moose Creek site consists of an A-horizon stratum eighteen inches thick, superimposed on indurated clay and fluvial gravels. Most of the cultural material was found in the A-horizon stratum of Test Pit I. Projectile point S-46-23 (Figure 20) was found in situ in Test Pit I, thirteen inches beneath the surface--the greatest depth of any projectile point found by the survey party in the Gallatin Canyon. A similar specimen (S-46-22) lay two inches beneath the surface. A small plano-convex scraper (S-46-10) was recovered at a depth of ten inches.

The projectile points constitute three types (Figure 20). S-46-49, a base-notched side-notched point made of black ignimbrite, is a "recent" or Late Period type in the Montana Southwestern Sub-Region. S-46-6 is another type of side-notched point. S-46-3, 9, 18, 19, 22 and 23 are corner-notched points. S-46-1 through 5 might by typologically referable to the Early Period. S-46-4 is a side-ground type. S-46-5 is made of black ignimbrite, a material not often used during the Early Period. Obsidian and ignimbrite seem to have been in general use during the Later Period in the Montana Southwestern Sub-Region (Arthur 1962: 26); however, this might not have been the case in certain portions of southwestern Idaho (Gruhn 1961: 51). The most significant observation to be drawn from examination

of the projectile points is the lack of triangular side-notched types. S-46-49 is the single definitive example of this type. Dozens of points comparable to this specimen have been collected at the Hot Springs Bison Drive (Cf. Plate I, Photo I). There is an evident preponderance of triangular side-notched projectile points in the bison drives located in the Gallatin Valley, and relatively few points of this type in the material culture of the archaeological sites found in the Gallatin Canyon. The ramifications of this situation will be discussed in Chapter VIII.

Various types of implements were found on the surface of the Moose Creek Site (Figure 21). S-46-62 is one of the few complete knives that the survey party found in the Gallatin Canyon. S-46-44 might possibly have functioned as an awl. Drills or perforators were not found at this site; indeed, these implements are scarce in the entire Gallatin Canyon, although they are common in the material culture of occupation sites located in the Gallatin Valley.

Among the unmodified faunal remains found in Test Pit I were three fragmentary teeth (species unidentified) and a half-dozen fragments of bone (possibly representing Odocoileus hemionus).

The Moose Creek site provides a good example of serial occupation; the projectile points found on the site surface span an extensive temporal range. According to Mulloy (1943: 179), the Red Lodge site, located in south-central

Figure 2024 GA 317 (S-46)

49. Type 23, black obsidian

6. Type 18, basalt

18. Type 15, grey chert

19. Type 15, jasper

23. Type 14, black obsidian

22. Type 14, brown CY

9. Type 15, basalt

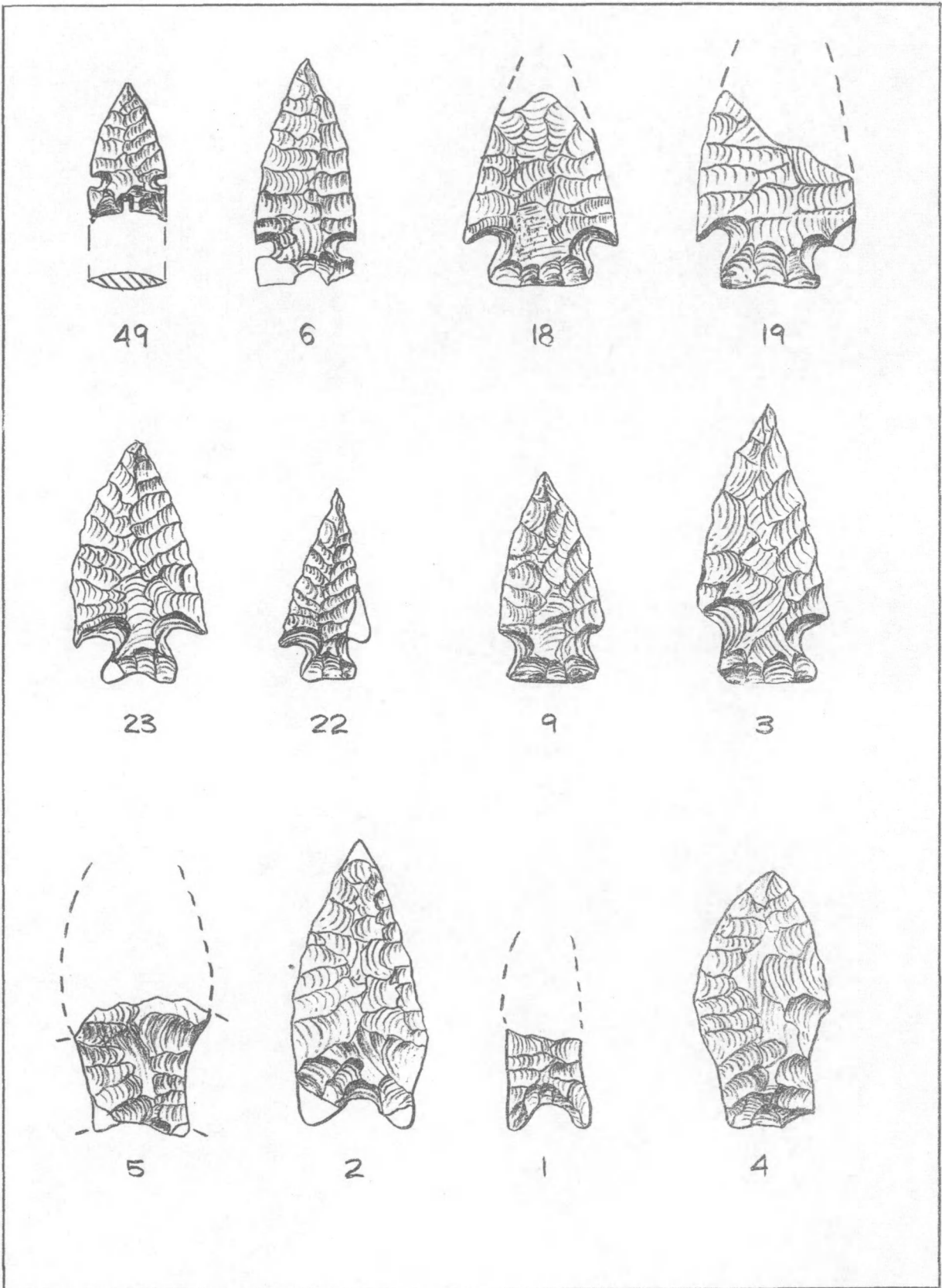
3. Type 11, grey agate

5. Type 6, black ignimbrite

2. Type 6, basalt

1. Type 6, black obsidian

4. Type 6, dark CY



49

6

18

19

23

22

9

3

5

2

1

4

INCH

- FIGURE 20 -

24GA317

Montana, presented a similar situation:

The obscurity of the Red Lodge material culture lies in its inclusion of items peculiar to each of the three earlier levels of Pictograph Cave . . . but here without the stratigraphic differentiation that appears in the cave.

Very few large serially occupied sites have been excavated, for, as Forbis has pointed out (1955: 10), often maximum expenditure of labor and funds yields minimal or negligible results.

24 GA 318 West Fork: At a site located inside the confluence of the West Fork and the Gallatin River, members of the field party found an interesting series of artifacts. Unfortunately, in 1890, gold-prospectors destroyed a large portion of this site, and post-World War Two construction destroyed the remainder of the occupation area.

A series of terraces have been eroded from the broad alluvial plain located west of the river. The narrow primary, or floodplain terrace was unoccupied, since it is overgrown with pine, aspen, and willows. Bunch-grass and sagebrush cover the surface of the secondary terrace, which rises some twenty feet above the floodplain. Flakes and artifacts were found on exposed portions of the surface. A third terrace, the summit of which is about fifty feet higher than the surface of the secondary terrace, flanks the west side of the Gallatin Canyon. Here were found several artifacts and a quantity of flakes. These three terraces are

Figure 21

24 GA 317 (S-46)

—————

- 10. Scraper Type 2, red jasper
- 28. Scraper Type 1, jasper
- 29. Scraper Type 3, jasper

—————

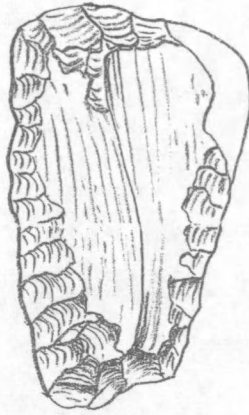
- 62. Knife Type 2, yellow CY
- 61. Knife Type 2, white chert
- 44. Perforator Type 1, jasper

—————

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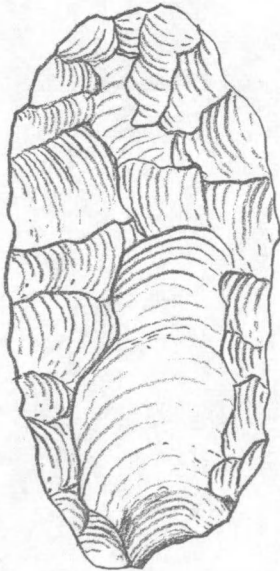
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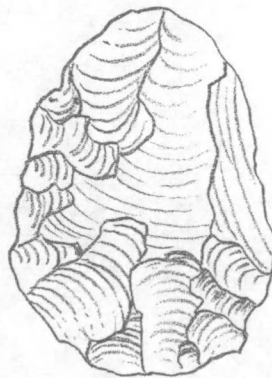
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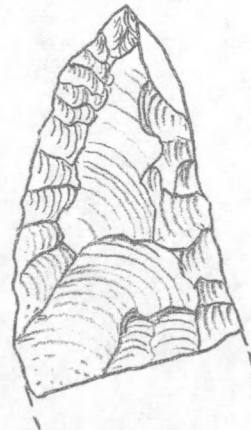
29



62



61



44

INCH

-FIGURE 21-

24GA317

geologically separate, but the cultural material found on the second and third terraces seems to be without cultural differentiation.

Members of the field party found several knives, scrapers, and projectile points. The latter ranged from lanceolate-shaped side-ground types to triangular-shaped corner-notched types (Figure 22; Figure 38, S-8-1). Side-notched types were absent. Most of the artifacts were surface finds that could have been unearthed either by prospectors or by recent residential construction.

The tabular, sagebrush-covered valley drained by West Fork Creek forms a major western branch of the Gallatin Canyon. At the upper, or west end of this valley, two passes cross the divide between the Gallatin and Madison River watersheds. The south pass branches into the headwaters of Cedar Creek; the north pass into Jack Creek. Both streams are tributaries of the Madison River. The Indians could have entered the Gallatin Canyon via either of these passes.

24 GA 321 Cedar Pass: When the author climbed Lone Mountain (elevation 11,194 feet) in 1952, he discovered a small occupation site located on the summit of a divide between the drainages of the West Fork of the Gallatin River and Cedar Creek, a minor tributary of the Madison River.

The field notes read, in part, as follows:

Productive site, considering the remote locality. Forty flakes, all basalt, chert. Pass evidently a crossing between the Madison and Gallatin Rivers. Found portion of oval knife (chert) and one projectile point (small, corner-notched, basalt). The general area is quite rich in fossil shells.

The projectile point mentioned in the field notes (S-18-1), and a point found by Don Jenni, are illustrated in Figure 22. Jenni (1960: 2) described this site in an article titled A Ranger Basin Campsite. Jenni believed that the site was occupied by hunters who were following game from their summer to winter ranges. This supposition is probably essentially correct. The Indians hunted elk and deer in the "high country" during the summer months, and followed the animals as they migrated to the low valleys in the autumn. Similar hunting patterns have been described in recent anthropological literature (Rogers 1963).

The author has explored many of the remote canyons in the West Fork watershed, including Moonlight Creek, the Yellow Mule Creeks, and the North Fork of West Fork Creek. A few flakes were found in several locations on the banks of these streams.

24 GA 319 Beaver Hills: Scattered flakes and a few artifacts were found on the summits of a series of low terraces located near Porcupine Creek. A side-notched point (S-13-6) might be an example of one of the most recent types of projectile points found in the Montana Southwestern Sub-Region. S-13-1, 8, and 10 (Figure 22), although typolog-

ically older, were found in association with S-13-6.

24 GA 320 Portal Creek: Twenty flakes were found on the sagebrush-covered tabular surface of a small secondary terrace located outside the confluence of Portal Creek and the Gallatin River. In 1953, U.S. Highway 191 was re-routed in this vicinity and the site was totally destroyed. During the early phases of construction, the right-of-way was examined by members of the field party, but additional archaeological material was not discovered.

24 GA 322 Beaver Creek: A small occupation site is situated on a low stream terrace rising north of Beaver Creek. The creek is flanked by paired terraces that extend to the Gallatin River, located more than a mile northeast of the site. Sagebrush, bunchgrass, and small mountain willows grow on the site; nearby is a dense grove of aspen and pine trees. A small spring rises in the grove and flows into Beaver Creek: the occupation area is located on the terrace between the spring and the creek.

In 1949, when the author discovered the site, bones and a few basalt flakes were exposed discontinuously at a depth of eight inches along some thirty feet of the eroded bank of Beaver Creek. A dozen post-cranial bones were found; none had been burned or modified by human agency. The species represented could not be identified. In 1952, floods destroyed much of this portion of the site.

Figure 2224 GA 321 (S-18)

1. Type 13, basalt
 2. Jenni Collection
-

24 GA 323 (S-116)

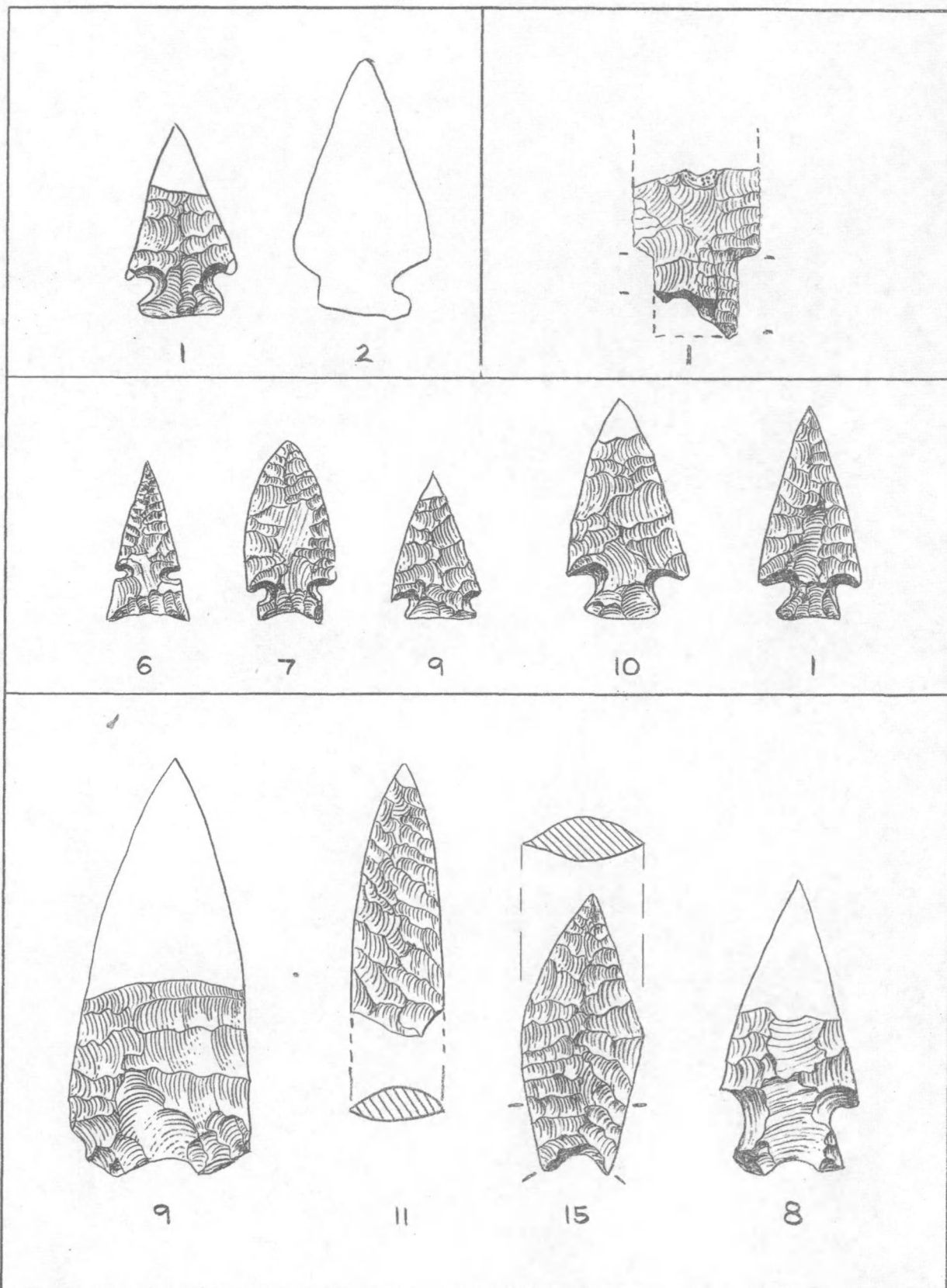
1. Type 1, dark CY
-

24 GA 319 (S-13)

6. Type 24, dark CY
 7. Type 18, black ignimbrite
 9. Type 17, brown CY
 10. Type 15, black obsidian
 1. Type 13, grey SS
-

24 GA 318 (S-8)

9. Type 3, brown CY
 11. Type 1, grey SS
 15. Type 6, basalt
 8. Type 10, white chert
-



UPPER LEFT 24GA321
CENTER 24GA319

UPPER RIGHT 24GA 323
LOWER 24GA318

-FIGURE 22-

Artifacts: Members of the survey party examined the eroded surface of the site and found a single side-notched projectile point (S-41-4), several corner-notched points, and a side-ground point (Figure 38, S-41-10). The latter closely resembles Agate Basin projectile points (Wormington 1957: 142). The corner-notched points and the single side-notched point are illustrated in the upper row of Figure 23. Row two depicts projectile points comparable to types found in the Montana Western Region. Row three includes a "beveled-knife" and a combination "awl-scraper" implement. The latter type might be of some diagnostic value, as similar specimens have been found in the Montana Western Region (Napton 1964a, Field Notes).

The corner-notched projectile points may have been deposited on the site during a brief period of intensive occupation, or, conversely, perhaps during a very lengthy span of intermittent occupation. One would suspect that the corner-notched types were used during a considerable span of time: they are much more numerous than other types, and they exhibit a greater variation in basic shape or form. It is possible to conclude that a similar inventory of projectile points is found in most Gallatin Canyon sites, viz., there are a few Early Period points, numerous Middle Period types, and very few--if any--Late Period side-notched types.

Lifeway: The Beaver Creek site might have been

serially occupied by different groups of hunters who used various types of projectile points and tools. The site could have been continuously occupied during the summer months. One might suppose that the Indian men hunted in the hills, while the women remained at the site--a procedure practiced by many hunting and gathering aggregations. The scrapers and the "awl" or perforator were used in preparing hides for clothing or shelter. The presence of faunal remains indicates that animals were butchered on or near the site. Perhaps this was a "kill" site (the animals might have been killed while grazing); however, since the lithic inventory consists of flakes and various types of implements, the site might also have been the scene of domestic occupation. The variety of projectile point types indicates that the site was serially occupied; therefore, it might have been used at different times for different purposes.

The author has not completed investigation of this site. Unfortunately, there is only a slight possibility that additional artifacts will be found, since the cultural material is rather thinly distributed over an extensive, heavily overgrown area.

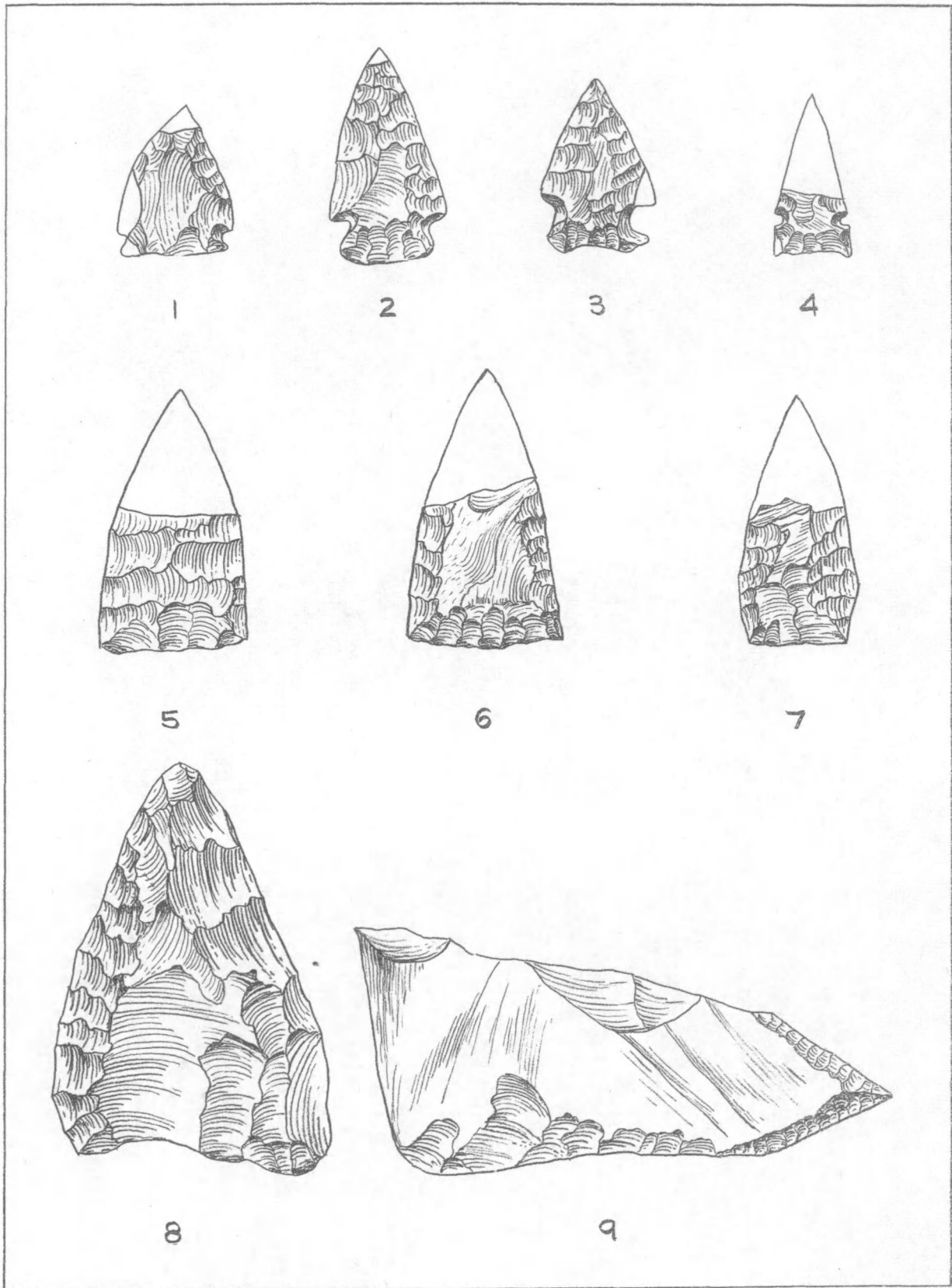
24 GA 323 Rainbow: A small occupation site is located on the west bank of the Gallatin River, approximately 500 yards from the Rainbow Guest Ranch. Caterpillar tractors engaged in building a gravel pit stripped much of the topsoil

Figure 2324 GA 322 (S-41)

1. Type 17, red jasper
2. Type 16, white pinyon quartzite
3. Type 13, black obsidian
4. Type 22, black obsidian

5. Type 9, basalt
6. Type 9, white agate
7. Type 9, black obsidian

8. Knife Type 1, basalt
9. Perforator Type 1, brown CY



SCALE ACTUAL SIZE

- FIGURE 23 -

24 GA 322

from the site surface. In 1961, the author examined the exposed soil and found three flakes and the distal portion of a projectile point. This specimen may be an Early Period projectile point type (Figure 22, S-116-1). The sides of the straight stem have been smoothed.

The Rainbow site is located on the 6,100 foot contour (United States Geological Survey Gallatin quadrangle). The author will conduct additional investigations in this locality.

The Upper Gallatin Canyon

In 1958, the author participated in an archaeological survey of Yellowstone National Park. He was responsible for archaeological reconnaissance in the upper Gallatin Canyon. The project is reported as An Archaeological Survey of the Gallatin River Canyon, Yellowstone National Park (Napton 1959).

The Gallatin River provides a convenient line of demarcation between Gallatin County and Yellowstone National Park. Approximately thirty-five miles of the eastern border of the county is shared by the park. The material culture of the local archaeological sites is, of course, not affected by the arbitrary political boundary. The ecology does not change in this vicinity, but there is a marked alteration in the physiography of the Gallatin Canyon.

The main canyon divides into two branches, the larger

of which extends east into Yellowstone National Park and the State of Wyoming. The Gallatin River rises in the remote mountains at the eastern end of this extensive, grass-covered valley. Most of the archaeological sites located in the valley are small; the material culture is sparse. The author found one unusual artifact--a tubular pipe made of steatite (Taylor 1964: 149-50).

The south branch of the Gallatin Canyon continues in the same general direction maintained by the axial stream in the lower portion of the main canyon. The valley or upland meadow gradually rises to form a summit between the watersheds of the Gallatin and Madison Rivers. The summit or divide is located between the drainages of these two large rivers. Grayling Creek flows southwest from the divide, joining the Madison River in the great West Yellowstone basin. East of this extensive basin, upstream along the Madison River, is the interior plateau of Yellowstone National Park. West of the basin, downstream on the Madison River, is the vast Madison Valley and the Three Forks of the Missouri River (Figure 7). West Yellowstone Basin is flanked on the west by the Henry's Lake Mountains. Targhee Pass affords direct access through these mountains to the Snake River Plain in Idaho. This low pass may have been one of the principal routes between the Snake River, the headwaters of the Missouri, and, ultimately, the Northwestern Plains. Five interesting sites were discovered in the upper Gallatin

Canyon and the West Yellowstone basin.

24 GA 324 Tepee Gallatin: An unusual series of projectile points was found on the surface of this small site, located inside the confluence of Tepee Creek and the Gallatin River. The specimens were collected in 1954: eight years later the site was totally destroyed during the reconstruction of U.S. Highway 191.

Cultural material was found scattered over the level surface of the secondary river terrace. Side-notched projectile points were the predominant type. These fragmentary specimens are similar to projectile points found in the deposit of the Emigrant Bison Drive (24 PA 308). This site is less than fifteen miles southeast of the Tepee Creek site, however, the Gallatin Range lies between these sites.

24 GA 325 Snowflake Pole Lodges: The remains of two collapsed pole lodges were found on a steep mountainside located two miles south of Snowflake Springs. In 1940, a large pine tree fell from the surrounding forest and toppled both lodges (Plate II, Photo 3).

The principal lodge, designated Structure I, was constructed of more than 100 straight lodge pole pines (Pinus contorta). Some of the poles exceed six inches in diameter at the base. None had been hewn.

The stratigraphy of the floor area consists of an A-horizon four inches thick composed of pine needles and

rotten wood. This accumulation is superimposed on a well-developed podzol soil. The surface of the A-1 soil zone could have served as the "floor level," however, no flakes, ash, or cultural material were found.

Structure II is a very small lodge located fifteen feet north of the principal structure (Plate II, photo 3). Since none of the pine poles in either structure exhibit axe marks, one might speculate that these structures are older than the pole lodges found in the canyon of Wigwam Creek (24 YE 301).

Structures of this type have been designated "wickiups, conical pole lodges, vertical pole tepees," and "war lodges." There is little reason to suppose that these are war lodges per se, even though such structures are often found in isolated locations, for they might as easily have been hunting lodges. Indeed, most of the extant samples have survived because they were situated in remote localities, or in forests that have not been swept by fire. Malouf (1963: 1-11) mentions that Lewis and Clark observed pole lodges along the banks of several of the major watercourses in Montana, e.g., on the lower Yellowstone River. According to Lowie (1935: 89), Crow "warriors . . . and eloping couples . . . put up crude shelters (acta 'tse') of sticks, bark, and foliage . . ." Evidently "war lodges" might have served the purposes of Venus as well as Mars.



Photo 3. 24 GA 325: Snowflake Pole Lodge. Note large pine which fell on lodge. Photo looking northwest.



Photo 4. 24 YE 301: Wickiup Pole Lodge, Structure Two. Looking east. Photograph taken in 1958.

The Snowflake pole lodges are composed exclusively of pine poles. Since the locality is watered only by precipitation, the site may be amenable to dendrochronological study. Several poles and nearby living trees were sampled; the increment cores are presently undergoing laboratory study at the University of California.

24 YE 301 Wickiup Creek Pole Lodges: The Snowflake pole lodges are quite similar to three lodges located in the canyon of Wickiup or Wigwam Creek, a small stream entering the Gallatin River from the east. In 1958, during the archaeological survey of Yellowstone National Park, the author excavated two of these structures. When the author's parents photographed the lodges in 1938, all three structures were standing. Two lodges have since been wrecked by falling aspen. The survivor (fortunately the principal lodge) will be referred to as Structure Two (Plate II, Photo 4). Conical in shape, this lodge is composed of 130 aspen poles. The spacing between the poles averages five to six inches, but there is no particular pattern evident in the arrangement. Four of the poles forming an integral part of the structure were cut with a sharp implement, probably a metal axe.

A single pine pole was used in construction of this lodge. In cross-section, the pole displays large inner growth rings, however, the exterior annual growth rings become progressively smaller and smaller. Evidently the

immature pine died because it was overshadowed by adjacent mature trees. Most of the pines growing in the narrow canyon receive adequate water from Wickiup Creek. It might be difficult to date this complacent growth by means of dendro-chronological techniques.

The most prominent feature disclosed during the author's excavation of Structure Two was a large rimless firehearth centered in the area enclosed by the lodge. The hearth, one and one-half inches thick, contained grey-white ash and small pieces of burned bone. It was covered by one and one-half inches of earth and humified pine needles which formed the A₀₁-A₀₃ layers of the A-horizon. The hearth had been built in a prepared depression in the otherwise level surface of a typical forest podzol; the A-1 surface probably represents the floor, or occupation level. The undisturbed soil beneath the firehearth was not discolored (Cf. 24 GA 314).

Twenty-five chert flakes, one black obsidian flake, and one grey pinyon quartzite flake were found in situ on the occupation level. A single large chert flake had been modified; possibly this specimen was a perforator. No projectile points were found. Twelve cobblestones averaging five to six inches in width and three inches in thickness were found in situ along the inner periphery of the lodge. These stones were spaced an average distance of eight inches

apart, forming a semi-circle describing less than half of the perimeter of the structure. These stones may or may not have been functional. Similar stones were not found inside Structure Three.

Excavation of Structure Two revealed that the poles forming the structure have sunk some four to six inches into the soft A-horizon strata. Since more than eight inches of the base of these poles has rotted, the lodge is gradually diminishing in height, as well as in width. This phenomenon suggested an experiment: the author marked a series of points on the interior poles and measured the distance between the various points. If the lodge survives, it may be possible, over the course of a few years, to calculate the approximate minimum age of the structure by measuring the amount of reduction in the distance between the various points.

A large pine tree has fallen on Structure Three. This small lodge was composed of seventy-five aspen poles. No pine poles were used in the construction. The author excavated the probable occupation area and found a single archaeological specimen, a flake of grey Pinyon Quartzite (Cf. 24 PA 324). This material is not usually found in the Gallatin Canyon. Perhaps it was obtained in Yellowstone National Park or in the upper Yellowstone Valley. There was no firehearth in the floor-area of Structure Three.

Structure One, built of seventy-five aspen poles, is

located adjacent to the creek. The floor area of this small collapsed lodge was not excavated.

Members of the field party, authorized by the District Park Ranger, cut down several "snag" aspen that threatened the survival of Structure Two.

The Wickiup Creek pole lodges evidently are authentic, albeit recent, aboriginal constructions. It has been argued that the presence of axe-hewn poles in these structures indicates that they were built by Caucasians; however, the Indians had metal axes at least by 1805, and there is no direct evidence indicating that these particular structures were built prior to that date.

Several groups of pole lodges are located in the interior of Yellowstone National Park. These lodges are said to have been constructed by Sheepeater Indians (Norris 1879: 10). The known distribution of pole and log lodges has been extended by recent investigations in the valley of the Yellowstone River (Conner, personal communication, 1964), and in the valley of the Saint Mary's River, west of Glacier National Park (DesRosier 1965: 13-4).

24 GA 325 Big Spring: A large occupation site is located in the vicinity of "Big Spring," a stream some five feet wide issuing from one of the Hebgen fault-scarps. The site was one of the largest in the West Yellowstone basin, however, in 1906, when Hebgen Dam was built on the Madison

River, most of the site was inundated. Portions of the occupation area remaining above water were examined by local relic collectors, who rapidly depleted the available archaeological material. When the Madison earthquake damaged Hebgen Dam in 1959, the lake was partially drained, and members of the survey project found a quantity of obsidian and ignimbrite flakes in the morass of the lake bottom. Some of the obsidian could have been obtained from the famous Obsidian Cliff, located in the interior of Yellowstone National Park, however, nodules of obsidian were found in the immediate vicinity of the site. Approximately forty percent of the flake sample consists of black and red ignimbrite, a vitriform material that is said to be plentiful in Idaho (Gruhn 1961: 50). Obsidian flakes predominate on many sites located in the interior of Yellowstone National Park. For example, at the Sheepeater Cliff site, ignimbrite flakes comprise less than five percent of the lithic sample (Table 3).

The artifacts found at the Big Spring site include a projectile point made of black ignimbrite and one made of black obsidian. These specimens resemble Agate Basin points (Wormington 1957: 142). Most of the projectile points, however, are corner-notched types (Figure 24). Two interesting implements are problematical milling stones (Figure 25, 26). Similar artifacts, described as "hand-stones" have been reported found in Wyoming (Davis 1956: 111, Pl. IX, e).

Hoffman (1961: 87) states that a comparable specimen was found in northern Yellowstone National Park.

24 GA 327 Targhee Pass: This small occupation site, located approximately four miles east of the summit of Targhee Pass, is situated in the southern extremity of the Gallatin survey area. A single corner-notched projectile point made of ignimbrite and about thirty flakes of ignimbrite and chert were found on the surface of a large grassy meadow. The landowner stated that the site has been examined by relic collectors.

Madison Drainage

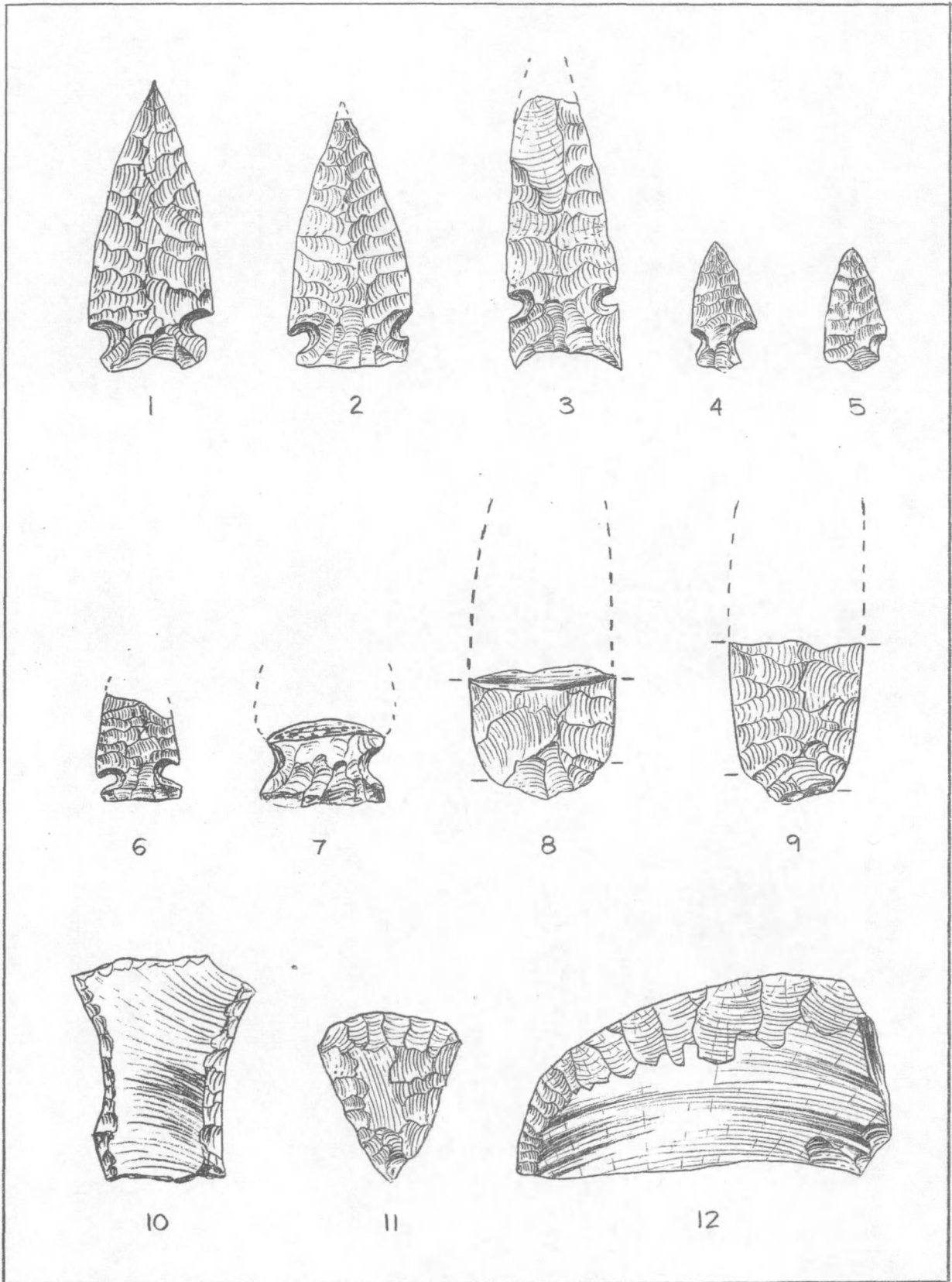
24 MA 301 Jeffers: In 1958, Mrs. Dede Jasmann introduced the author to Mrs. Tom Williams, a resident of Jeffers, Montana. Mrs. Williams has assembled a large collection of Indian artifacts found on surface sites located in the Madison Valley. One of the most interesting specimens in her collection was a fragmentary ceramic vessel. She had very capably restored the vessel from ten potsherds which she found in the plowzone of a field located near her home. Prior to cultivation, the field was covered by a sparse growth of typical xerophytic vegetation such as sagebrush (Artemisia, sp.) and grama grass (Bouteloua, sp.). The Bannock Indians are said to have camped in this vicinity in historic times.

Figure 2424 GA 326 (S-118)

1. Type 18, basalt
2. Type 15, brown CY
3. Type 22, black obsidian
4. Type 19, black obsidian
5. Type 19, black ignimbrite

6. Type 17, agate
7. Type 15, black ignimbrite
8. Type 5, black obsidian
9. Type 5, black ignimbrite

10. Scraper Type 6, brown CY
11. Scraper Type 3, agate
12. Scraper Type 4, black obsidian



ONE INCH

24GA326

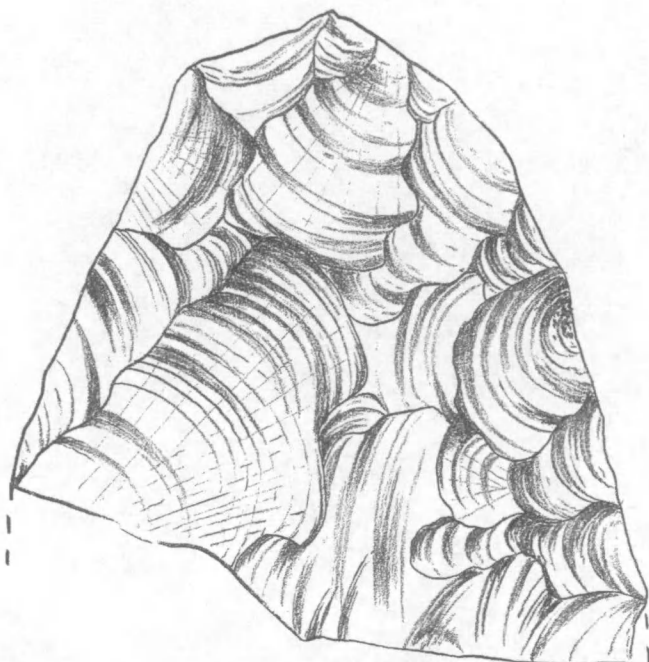
- FIGURE 24 -

Figure 25

24 GA 326 (S-118)

- 15. Knife Type 2, blk. obsidian
- 16. Scraper Type 2, black ignimbrite
- 17. Perforator Type 1, red jasper

- 18. Ground Stone Type 4, green diorite
- 19. Ground Stone Type 4, tan arkose



15

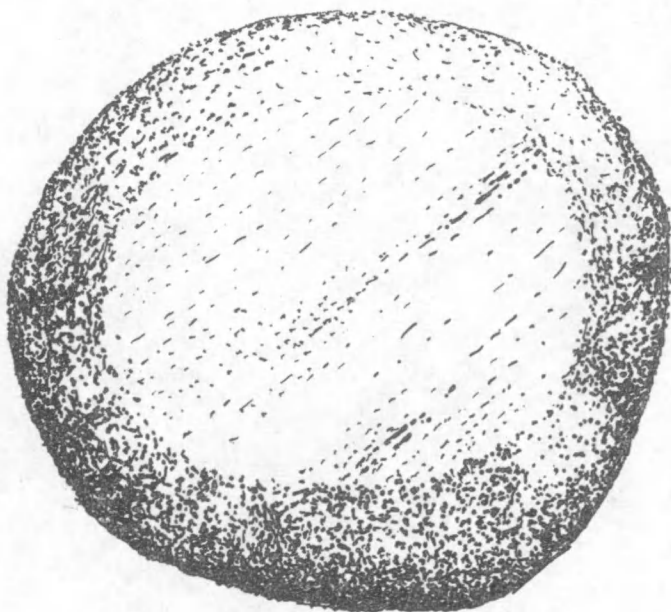


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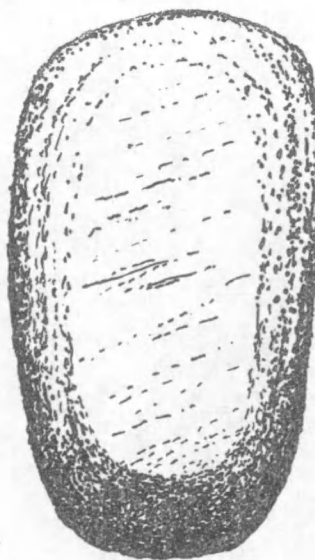


17

SCALE ACTUAL SIZE



18



19

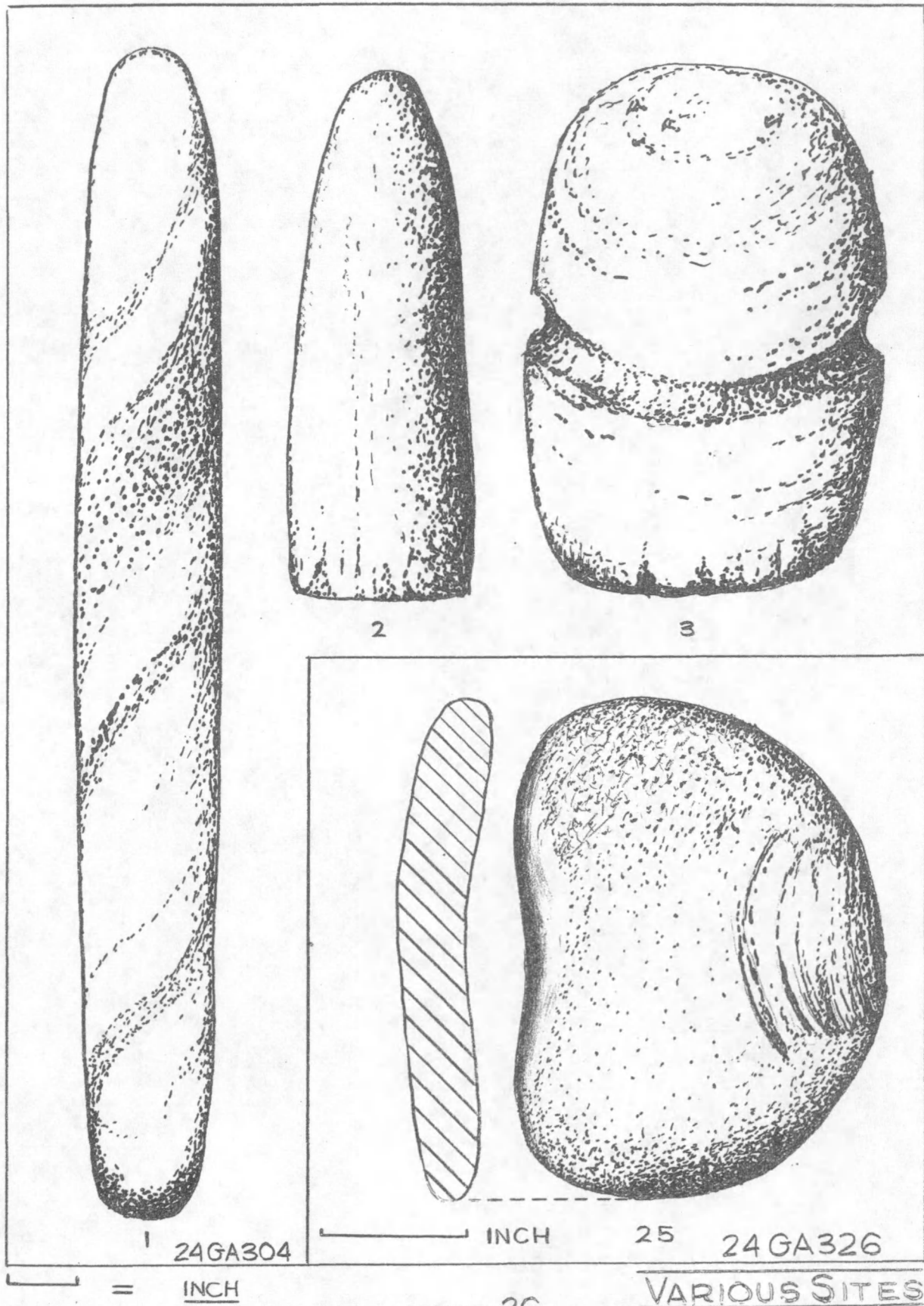
SCALE ONE HALF SIZE

24 GA 326

Figure 26

Gallatin Area Sites

1. Ground Stone Type 3, onyx
 2. Ground Stone Type 2, diorite
 3. Ground Stone Type 1, limestone
 25. Ground Stone Type 5, black unidentified material
-



- FIGURE 26 -

VARIOUS SITES

Ten sherds form the major portion of a small ceramic vessel (Plate III, photo 5). The remaining sherds evidently belong to one or more additional vessels. Fortunately, the author was able to add a basal sherd to the reconstructed vessel. The height of the intact vessel was approximately seven and one-half inches, base to rim; however, since a small portion of the rim is missing, the vessel might have been a few millimeters higher. The maximum width of the body of the vessel is seven and one-half inches. This figure was obtained by extending the thirteen centimeter arc formed by the curvature of the vessel contour. The maximum diameter of the base (three and one-quarter inches) was projected on the extension of a four centimeter arc; therefore it is possible that the base was slightly larger (Table 7).

Laboratory study of the vessel revealed the following:

- (1) The artifact is indeed pottery, not steatite or carved stone, as some observers have asserted.
- (2) The pottery is crude and thick; the aplastic is medium-coarse.
- (3) A deposit of carbonized organic material adheres to the interior of the vessel, indicating that it was broken during or after use, rather than during firing or manufacture.
- (4) The vessel may have been broken some time ago, rather than (for example) by recent cultivation of the site, since the edges of all of the sherds are rounded by weathering.

The sherds have been examined by Dee C. Taylor, Carling Malouf, William Mulloy, Richard Forbis, and ceramist

Frances Senska of Montana State University. The consensus of opinion is that the vessel was hand-modeled from a lump of clay and was finished with the assistance of simple implements. The interior of the vessel is scored with horizontal striae, probably created by rotary manipulation of a tool used to smooth the clay. The exterior of the vessel exhibits vertical striations. Frances Senska believes the striae may be the result of efforts to scrape or trim the surface of the vessel with a stick or piece of bone: a fragment of rib would have provided a useful tool. None of the striae can be construed as representing an attempt to decorate the vessel. There are no identifiable finger impressions; there is no indication of textile impressions on the bottom of the base, such as those observed by Touhy (1963: 62-3) on the basal sherds of Riddle Textile Impressed ware found in Idaho.

The sherds are not of uniform thickness; the base is significantly thicker than the walls. A water-rounded pebble of orthoclase, approximately one-quarter inch in diameter, is imbedded in the interior wall of the vessel. The inclusion of this pebble is perhaps explained by the possibility that the clay and aplastic (or temper material) were not collected separately; instead, the native potter used clay that already contained the desired amount of aplastic.

The vessel has the size, shape, and obvious general characteristics of Intermountain Flatbottom Ware (Figure 27),

although it lacks the annular basal flange often present on vessels of this type (Wedel 1954: 408). Intermountain Flatbottom ware is found in Montana, Wyoming, Idaho, Nevada, Utah, and California (Mulloy 1958: 190). This specimen is the second partially complete Intermountain Flatbottom vessel found in Montana to be described (Cf. Mulloy 1958: 197), although several specimens have been found.

Three or four pottery traditions are represented by ceramic material found in Montana. These traditions are (1) Mandan-Hidatsa pottery, found at the Hagen Site (Mulloy 1942: 11-38); (2) Woodland "Pisamik" pottery, principal types Ethridge and Wascana ware (Kehoe 1959: 239-40); (3) "Shoshone" Intermountain Flatbottom ware (Mulloy 1958: 196-201; Touhy 1963: 62; Wedel 1954: 403-09); and (4) so-called Plateau "pottery," made by the Sanpoil and Kutenai (Ray 1932: 127-33). Much of the pottery found in Montana is physically and stylistically intermixed, due to serial occupation of archaeological sites, as well as to the probability that some of these ceramic traditions were temporally coeval. Thus, the basic ceramic types will probably have to be ascertained by comparison with examples found elsewhere, outside Montana. Pottery traditions, as well as lithic traditions, are best understood in terms of regional, rather than local observation.

The sherds and associated material found at 24 MA 301 are described in a separate article to be scheduled for

TABLE 7: MADISON FLATBOTTOM WARE; ATTRIBUTES

<u>Title:</u>	Madison Flatbottom Ware
<u>Synonyms:</u>	Intermountain ware, Shoshone pottery
<u>Illustrated:</u>	Plate III, Figure 26.
<u>Type Specimens:</u>	24 MA 301
<u>Type Site:</u>	Jeffers Site
<u>Stages:</u>	Historic (Phase Two, Late Hunters)
<u>Construction:</u>	Hand modeled, not "patch" or coiled
<u>Firing Atmosphere:</u>	Oxidizing, uncontrolled, grey to black, exterior firing streaks
<u>Core Color:</u>	Variable; grey to black
<u>Temper:</u>	Coarse fluvial sand, orthoclase inclu- sions, mica, iron pyrites
<u>Carbon Streak:</u>	Black
<u>Texture Core:</u>	Medium strong
<u>Walls:</u>	Thick, weak, thinned by scraping
<u>Fracture:</u>	Random, no coil lines evident
<u>Surface Finish:</u>	Exterior rough; vertical striae, lumpy; no exfoliation; not floated. Interior rougher than exterior, horizontal striae
<u>Luster:</u>	Dull, occasional mica flakes
<u>Surface Color:</u>	Exterior-grey to light brown. Interior black
<u>Firing Clouds:</u>	Present on exterior

(Table 7 con't)

Forms: Flatbottom, inverted truncated cone,
flare angle: 17 degrees, atypical
absence of basal annular flange

Vessel Size: (See Table 8.)

Handles or Lugs: None

Decoration: None

Slip: None

Paint: None

Function: Cooking vessel

Comparable Specimens: (Noted in text)

Range: Montana, Wyoming, Idaho, Nevada,
California

Remarks: Interior walls exhibit carbonaceous
deposit (Food residue?)

TABLE 8: MADISON FLATBOTTOM WARE; METRICAL DATA

<u>Mouth Exterior Diameter:</u>	17 cm
<u>Upper Body Maximum Exterior Diameter:</u>	19 cm
<u>Base Maximum Exterior Diameter:</u>	8.4 cm
<u>Total Height (Estimated):</u>	19 cm - 19.5 cm
<u>Base Thickness:</u>	1.3 cm
<u>Body Thickness (Average):</u>	9 mm - 11 mm
<u>Base Reconstruction (4 cm arc):</u>	8.4 cm
<u>Mouth Reconstruction (13 cm arc) Interior:</u>	17 cm
<u>Outward Divergence, Base-to-Maximum Exterior Diameter:</u>	5.5 cm
<u>Estimated Angle of Body Divergence from the Perpendicular, Base to Rim:</u>	17 degrees
<u>Thickness, Wall (Average):</u>	1.0 cm
<u>Hardness (Moh's Scale):</u>	5-6

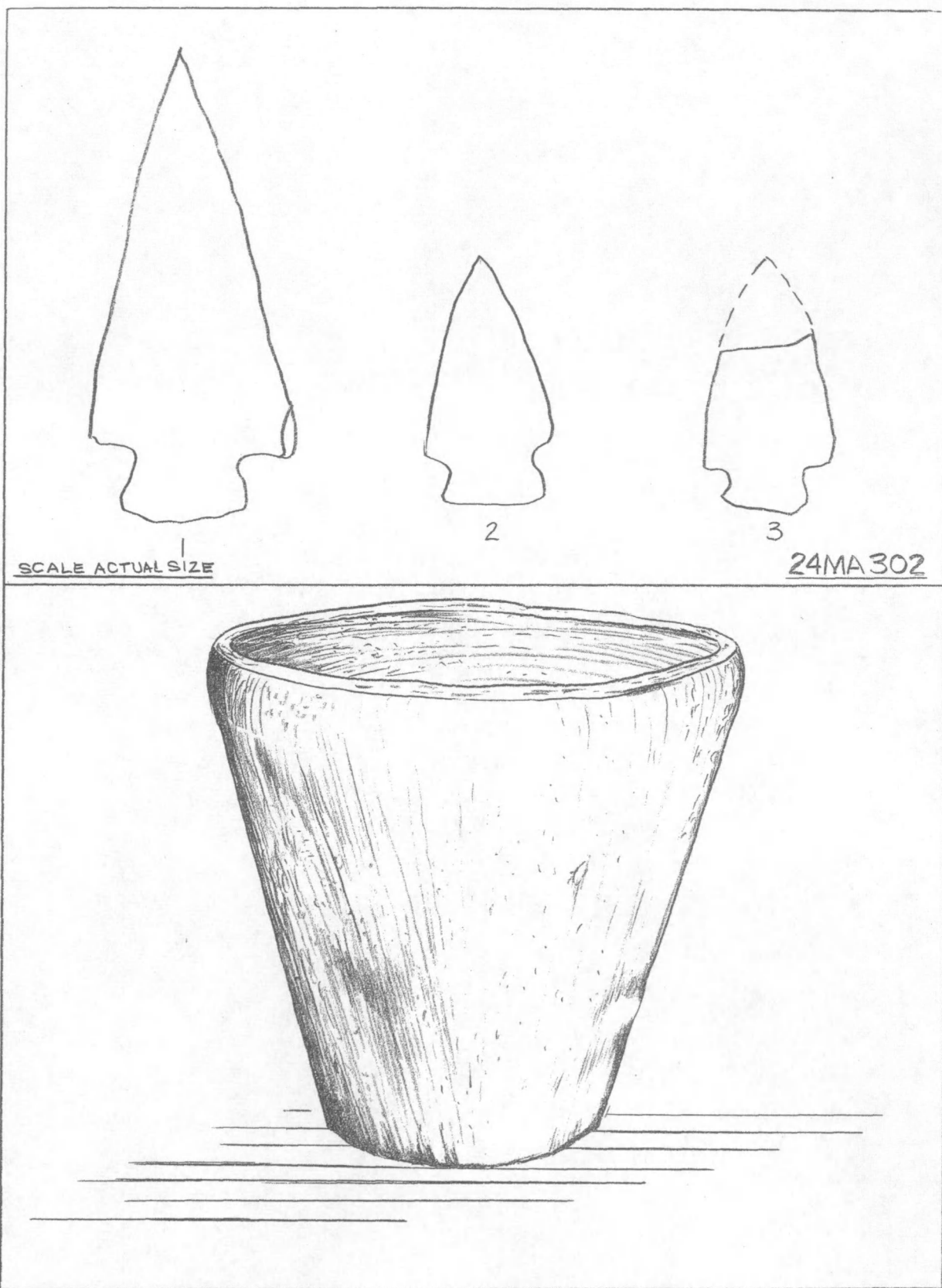
Figure 27

24 MA 302

1. Projectile point, basalt
 2. Projectile point, Pinyon Quartzite
 3. Projectile point, red jasper
-

24 MA 301

1. Madison Flatbottom ware ceramic vessel;
reconstruction of specimen (Plate III).
-



SCALE ACTUAL SIZE

24MA302

SCALE ONE HALF ACTUAL SIZE

24MA301

- FIGURE 27 -

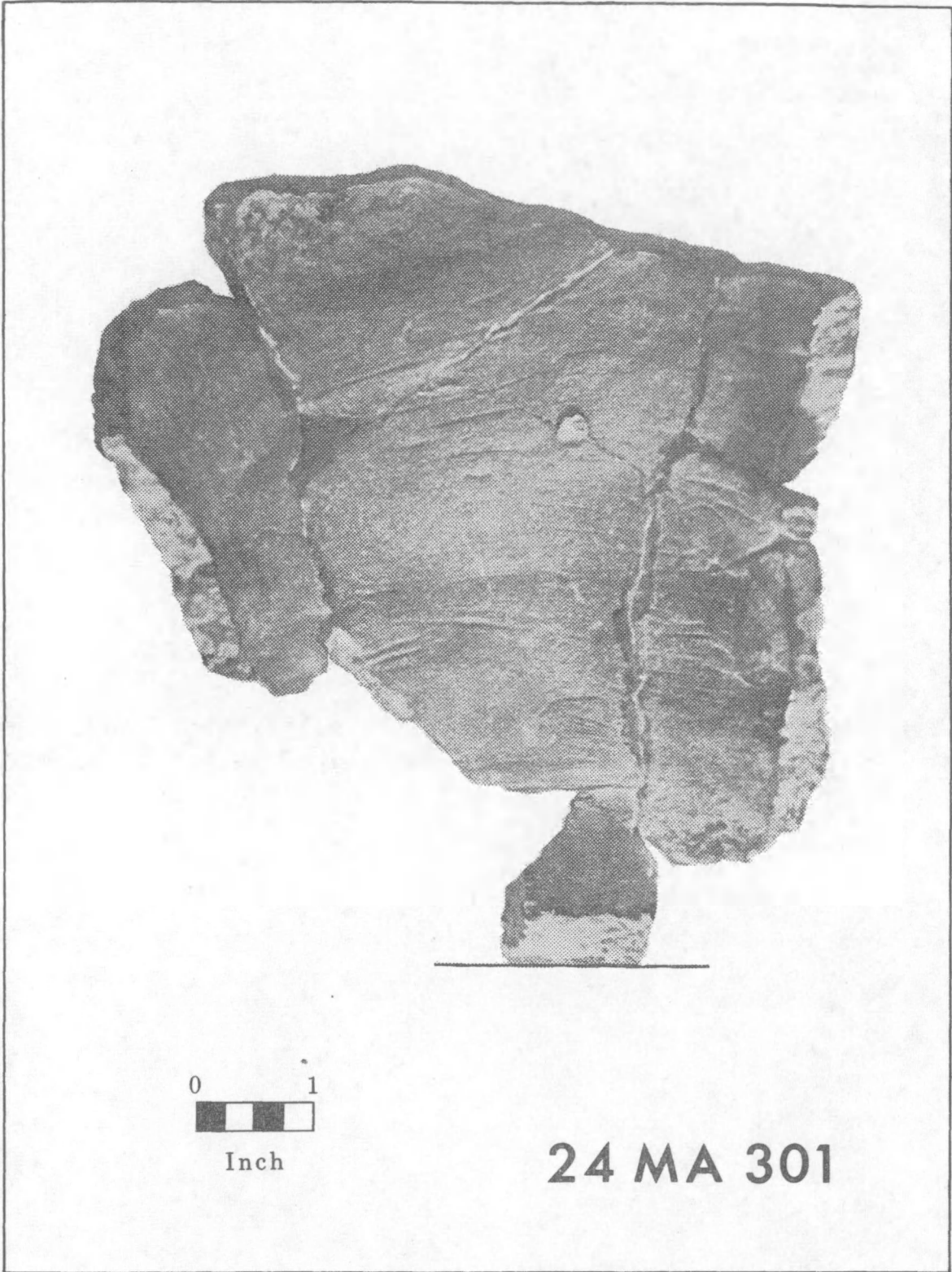


Photo 5. 24 MA 301; Madison Flatbottom Ware ceramic vessel. Note striae and pebble inclusion in vessel body.

publication in Archaeology in Montana. Thin-section analysis of this pottery is in progress, however, the results will not be available in time to be published in this study.

24 MA 302 Ennis Lake: Mrs. Williams found a minor occupation site in the backwaters of Ennis Lake. The site was located on the inundated former bank of the Madison River. Three projectile points found on the site surface are sketched in Figure 27.

24 MA 303 Cedar Fan: An unusual site is located on an extensive alluvial fan west of Ennis, Montana. On the surface of this remarkable geological feature are innumerable cairns, parallel rows of rocks, and curvilinear alignments that extend thousands of yards in all directions. The author first examined the locality in 1958, but very little was learned because of the difficulty encountered in attempting to resolve the pattern of the alignments. Local residents, assisted by the author, are presently engaged in mapping this extensive site.

24 MA 304 Red Bridge: A series of stone circles, locally identified as tipi rings, are found on the spacious tabular surface of a primary terrace located along the west bank of the Madison River. In 1958, Carling Malouf, the author, and students from Montana State University recorded eighty-five stone circles. The site is a classic example of

the occurrence of stone circles on the boulder-strewn surface of a river terrace: hundreds of rocks were used in the construction of these circles, but thousands of large rocks remain on the site surface. Scores of large angular rocks are found within the perimeter of most of the stone circles. If the Indians slept in the area enclosed by these circles, one might wonder why they failed to remove some of the large, extraneous rocks found within the dwelling area. Frequently, there are more rocks inside the area enclosed by the circles than are found outside their perimeters.

Firehearths and faunal remains have not been reported found in the test entries made in this site, however, a few knives, and several corner-notched projectile points made of basalt, have been found on the site surface. The occurrence of this material is by no means unusual: lithic material is often found on the surface of stone circle sites. The presence of such spatially associated cultural material has been appealed to as evidence that the stone circles mark the location of domestic dwellings. Since it is possible that many of these sites were serially occupied, the spatial association of cultural material does not necessarily demonstrate temporal association. Malouf (1961b: 381) Wedel (1961: 264) and others have cautioned that all stone circles cannot be identified as tipi rings. The author is not persuaded that the stone circles found on the surface of this particular site are tipi rings. Investigations of these configurations

might eventually produce empirical evidence as to their function (Cf. Kehoe 1960: 421-73).

(24 MA 306 Elk Creek): The Elk Creek site is located on the east bank of the Madison River, almost directly opposite 24 MA 304. The archaeological material found on the site included basalt flakes, a side-notched projectile point, several fragmentary bones and teeth, and a piece of unio shell. Similar shell fragments have been found elsewhere in the Madison River valley; for example, in the Point or Rocks Cave (24 MA 305), and in the plowzone of the Jeffers ceramic site (24 MA 301).

The archaeological material found at the Elk Creek site lay in a roadbed. The area between the roadbed and the riverbank is undisturbed. Stone circles are not present on this site.

24 MA 305 Point of Rocks Cave: The Point of Rocks Cave is a small, rather deep limestone solution cavity located on a steep mountainside east of Whitehall, Montana. The cave is about 200 feet above the Jefferson River: the view from the cave offers an unrestricted panorama of the lower Jefferson River valley. A small hotspring flows into the river immediately below the cave. The proximity of the river and the small hotspring made the cave an attractive occupation site. The location of the site has been known for many years, since the deep shadow of the cave aperture

is visible from many localities in the lower Jefferson River valley. The pictographs on the cave walls have been seen by many residents of the nearby town of Whitehall, Montana.

In the mid-thirties, the late Roy Austin (then superintendent of the Whitehall schools) brought the site to the attention of Dr. J. Leroy Kay, supervisor of a visiting party of paleontologists sponsored by the Carnegie Institute of Pittsburg. It was obvious to Kay that the tunnel-like cave sloped downward into the mountain. He correctly assumed that the lower levels of the cave fill contained fossil Pleistocene fauna.

The Carnegie crew excavated the undisturbed cave deposit, penetrating to a depth in excess of twenty feet (Figure 30). Dr. Kay did not publish a report describing the excavation.

In 1962, Mrs. Dede Jasmann, an outstanding student of Montana archaeology, contacted Dr. Kay, and subsequently provided the author with his address. Kay (Personal communication, July 1965) stated:

While doing geological and paleontological work in Montana for the Carnegie Museum of Pittsburg, Penna., we took time out to do some excavating in the Point of Rock (sic) cave. The Carnegie crew was assisted . . . by Roy M. Austin. We found a considerable number of sub-fossils and artifacts in the cave. The fossils were sent to the Carnegie Museum and Mr. Austin retained the artifacts.

Concerning the excavation, Kay stated only the following:

The cave was laid out in plats and the material was labeled as to the location of the plat and the depth.

I was informed that the sabre tooth specimen came from the back of the cave at a depth of eight feet. There is a portion of the cave which apparently has a greater depth than the rest of the cave. The material removed from the cave was screened.

The fossils and bones found in the cave were shipped to the Carnegie Museum of Pittsburg, and from that institution to the University of Montana. The author unpacked and examined some of the faunal material, which was wrapped in small brown paper packages tied up with string. Each package contained a small handwritten label that identified some of the bones and listed their approximate horizontal and vertical provenience in the cave. These labels and Kay's statements constitute the total known available documentation pertaining to the excavation, other than the information the author obtained from Mr. Austin.

Austin stated that the surface and upper layer of the cave deposit were extremely dry. An arrowshaft, a moccasin, and various leather fragments are said to have been found in the "top" or "upper one-foot layer." According to Austin, all of the archaeological material found by the Carnegie party came from the upper five feet of the deposit. This statement contradicts rumors that the archaeological strata exceeded fifteen feet in depth. Austin believed the "sabre tooth" mentioned by Kay was not Smilodon, but Machodon. Austin recalled that this fossil was found twelve feet beneath the surface.

Austin's collection of specimens from this site

consists of thirty lithic artifacts. According to Austin, side-notched projectile points were found in the uppermost strata; corner-notched points in the underlying strata; and triangular "un-notched" points in the lowest strata.

Projectile points 1, 6, 7, and 15 (Figure 28) in Austin's collection are side-notched types. Points 2, 11, 12, 20, and 21 are corner-notched points, and points 25 through 31 (Figure 29) are "un-notched" types. The latter are larger, and probably older, (Cf. Mulloy 1958: 33, Fig. 6, No. 9) than the small triangular projectile points often found in association with Late Period side-notched points (Mulloy 1958: 163). Several of the Point of Rocks cave artifacts appear to be quite similar to specimens found in Wilson Butte Cave, Idaho (Cf. Figures 28 and 29).

Mr. Austin arranged the Point of Rocks cave artifacts in groups identified by a combination of letters and numerals. The letter designation represents the horizontal grid location of the specimens; the numerical identification indicates their approximate vertical provenience. The various groups of projectile points were labeled B.3-4; B.4-5; C.1-2; C.2-3; C.4; C.4-5; and D.2-3. Since the faunal material is identified according to the same system, it might be possible to correlate at least some of the fauna with some of the projectile points. The chronological or stratigraphic sequence of the projectile points found in the Point of Rocks Cave is verified by stratified sites such as Pictograph Cave

(Mulloy 1958: 33, Fig. 6); Birdshhead Cave (Bliss 1950: 189); and Danger Cave (Jennings et.al., 1956: 101, Fig. 3).

When the Carnegie crew departed, local residents dug in the cave. The author has been unable to interview anyone connected with these activities. Relic collectors have found mauls, pestles, and ground-stone implements of various types in the Jefferson River valley. Ground-stone implements were not found in the cave; that is, they are absent in Austin's collection.

The author visited the Point of Rocks Cave in 1950. At the mouth of the cave is a mound of earth, ash, bone, and other material screened from the cave deposit. The debris included calcined bones, charred vegetal material, and burned twigs--material that would have been eminently suitable for radiocarbon dating, had the process been known at the time the site was excavated.

The quantity of bones found in the deposit suggests that the Indians partially butchered their kills in the valley, and carried certain dismembered portions to the cave. Thus, the faunal remains found in the cave deposit could have furnished important clues regarding butchering techniques and food preferences. Vegetal remains found in the dessicated deposit possible would have provided information pertaining to the constituents of the diet of prehistoric "Foraging Hunters."

The cave is approximately ten feet wide and eight to

ten feet high. The lower portion of the cave, which dips steeply into the mountainside, is some twenty-five feet deep. The terminal surface of the cave fill is marked by the darker hue of the cave wall.

Eight legible pictograph motifs painted with the usual red pigment decorate a large joint-plane located at the rear of the cave (Figure 30). Three are anthropomorphic motifs; the remainder are cruciform motifs similar to those found on pictograph panels located in the Montana Western Region (Malouf 1961a: 5), and in the pictographs near Princeton, British Columbia (Tiet 1930: 286). (Cf. 24 GA 301, Figure 10). The pictographs are located on the cave wall approximately at the height where one would paint when standing on the terminal surface of the cave deposit. Since the archaeological strata in the cave fill were at least five feet thick, it is reasonable to assume that these pictographs are rather recent. Nevertheless, some of the motifs on pictograph panels recorded by the author are located ten to fifteen feet higher than the present level where one is able to stand; indeed, in many instances the Indians seem to have made an effort to paint on elevated or inaccessible surfaces. Thus, the height of the paintings above the cave deposit is probably of little consequence. None of the motifs had been obscured by the cave deposit.

Most of Austin's projectile points are side-notched and corner-notched types (Figures 28 and 29); therefore, the

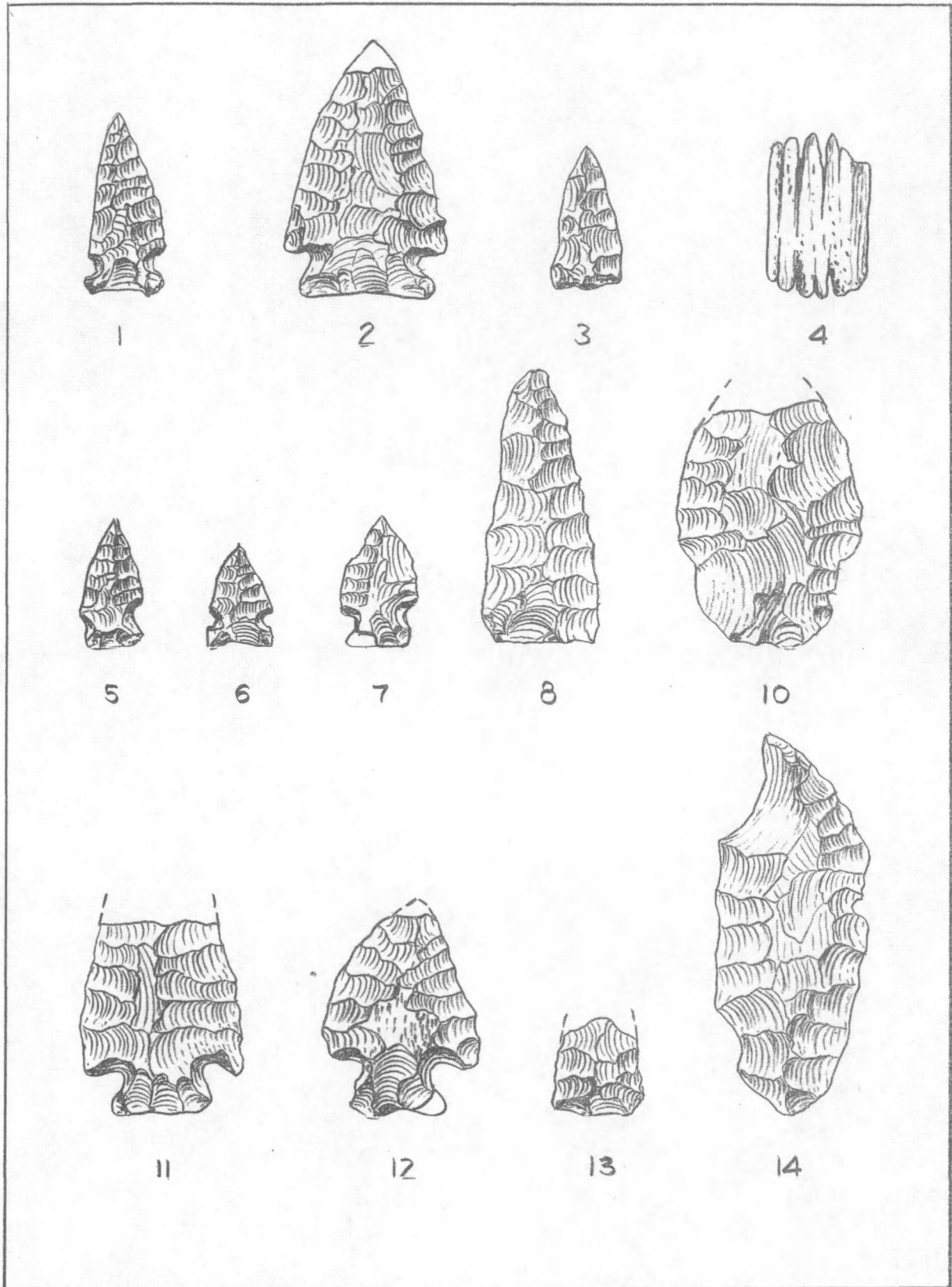
Point of Rocks Cave was probably not occupied before 500 B.C. (This date is, of course, only an estimate.) The small area of the cave floor--roughly ten by fifteen feet--would tend to restrict the number of occupants. Perhaps only single families, extended families, or small groups of hunters intermittently occupied the site.

(Other cave sites): Austin found a few artifacts in a small cave located some ten miles northeast of the Point of Rocks Cave. This site has been named "Sunlight Cave," an appellation generating rather inaccurate imagery, since the "cave" is little more than a rockshelter or cleft eroded in a massive limestone formation. Austin dug in the deposit and found several large flakes, all of which were stained red, presumably due to contact with earth of that color. Austin found a single recognizable artifact--a beveled-edge knife made of red jasper. It was three inches long, one and one-half inches wide, and one-quarter of an inch thick. Austin stated that he had excavated the cave "to bedrock."

The "Hand-Hold" Cave: Austin also examined the Hand-Hold cave, located some twenty miles southeast of Whitehall. The interior of the cave is excessively smoke-stained; however, local collectors state that they found no evidence of prehistoric occupation in the cave deposit. Residents of the locality have become inordinately concerned with "Indian caves," due to the publicity attending the Point of Rocks

Figure 2824 MA 305Austin Collection Artifacts

<u>Type</u>	<u>Control</u>	<u>Depth</u> <u>(feet)</u>	<u>Comparable</u> <u>Specimens</u>
1. Projectile point	C	1-2	
2. Projectile point	C	1-2	
3. Projectile point	C	1-2	
4. Possible "comb" (bone)	C	1-2	(Cf. Gruhn, 1961, Pl. 21:E)
5. Projectile point	C	2-3	
6. Projectile point	C	2-3	
7. Projectile point	C	2-3	
8. Knife (?)	C	2-3	
9. Flake		(not illustrated)	
10. Knife	C	2-3	
11. Projectile point	C	4	
12. Projectile point	C	4	
13. Projectile point	C	4	
14. Knife	C	4	



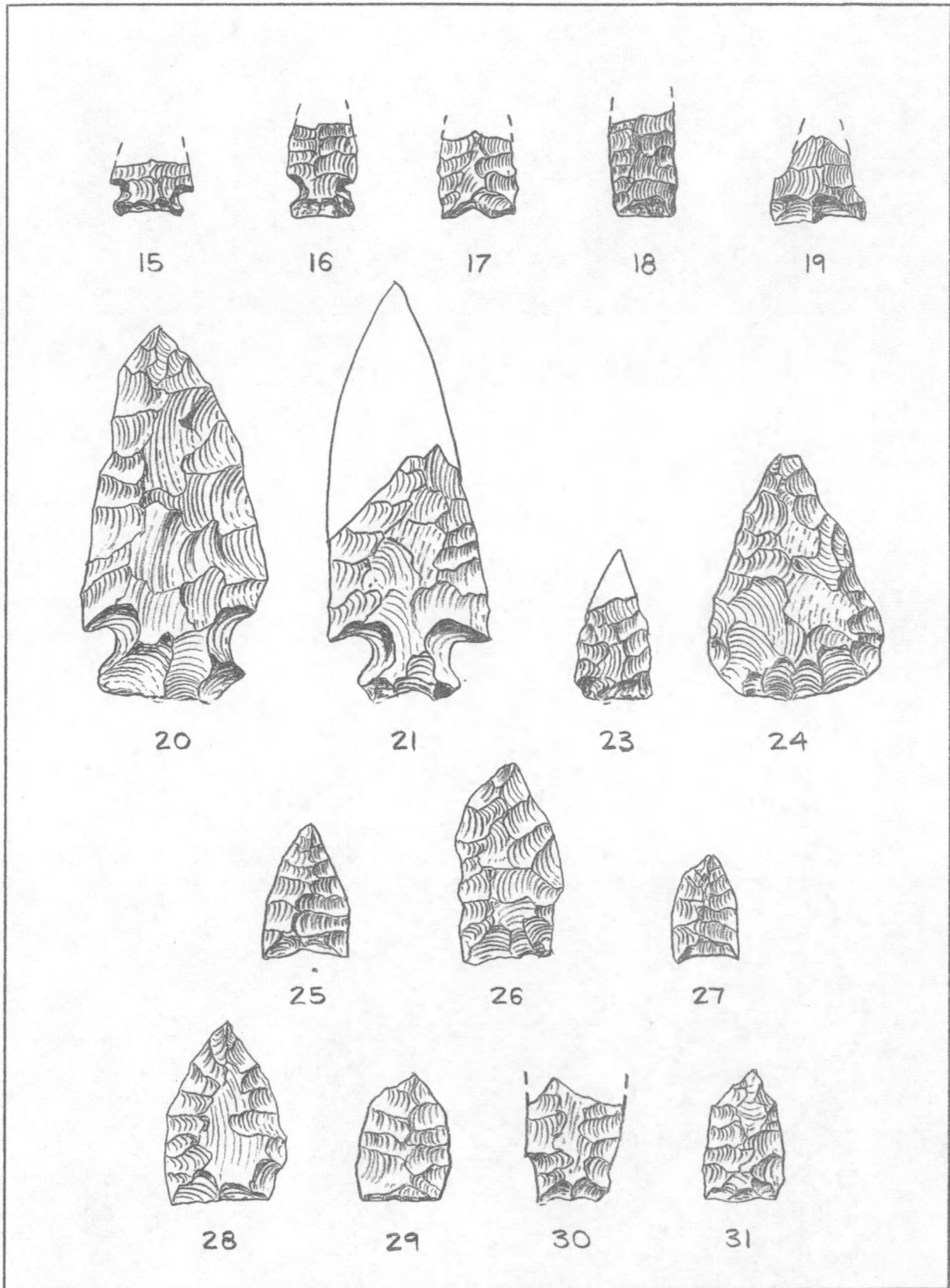
INCH

24MA305

- FIGURE 28 -

Figure 2924 MA 305Austin Collection Artifacts (Con't.)

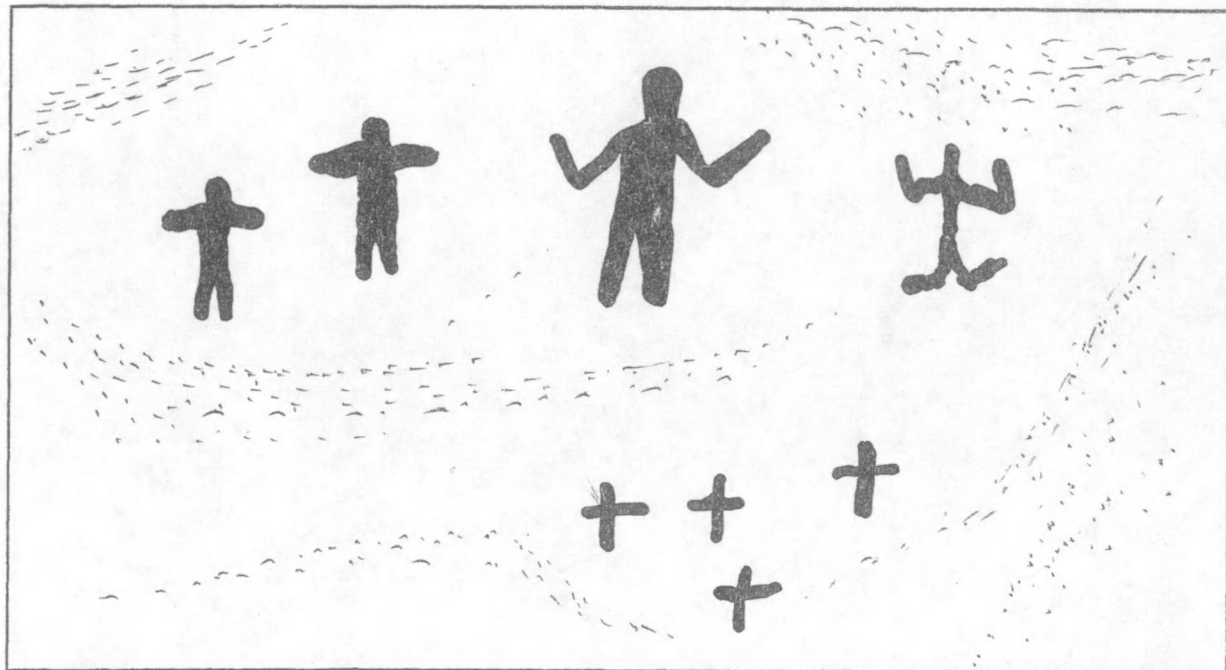
<u>Type</u>	<u>Control</u>	<u>Depth</u>	<u>Comparable Specimens</u>
15. Projectile point	D	2-3	
16. Projectile point	D	2-3	
17. Projectile point	D	2-3	
18. Projectile point	D	2-3	(Cf. Gruhn 1961, Pl. 37:C)
19. Projectile point (?)	D	2-3	(Cf. Gruhn 1961, Pl. 37:A)
20. Projectile point (?)	D	2-3	(Cf. Gruhn 1961, Pl. 14:R)
21. Projectile point	D	2-3	
22. Flake		(not illustrated)	
23. Projectile point	B	3-4	
24. Knife	B	3-4	(Cf. Gruhn 1961, Pl. 35: I-J)
25. Projectile point	B	4-5	
26. Projectile point	B	4-5	
27. Projectile point	B	4-5	
28. Projectile point	C	4-5	
29. Projectile point	C	4-5	
30. Projectile point	C	4-5	
31. Projectile point	C	4-5	



INCH

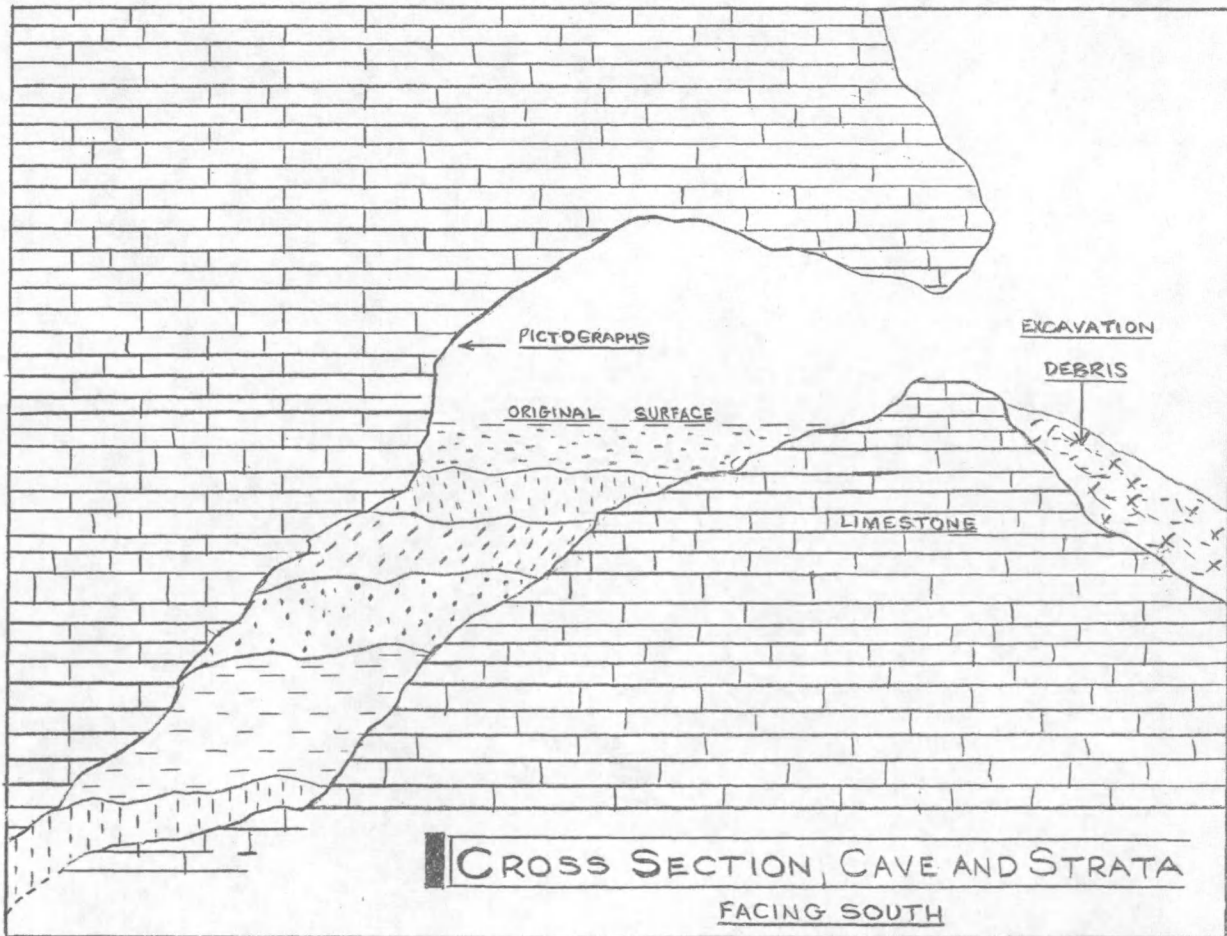
24MA305

- FIGURE 29 -



SCALE FOUR INCHES

24MA305



FIVE FEET

24MA305

- FIGURE 30 -

cave dig. Few cave deposits in Jefferson County have escaped their destructive attentions.

24 BW 401 Battlefield: This occupation site is located about ten miles east of the Point of Rocks cave. The local terrain is formed by a series of recumbent folds developed in Mission limestone. The formation strikes west, dips twenty degrees north, and has been eroded into deep south-sloping canyons. In one of these rather inaccessible canyons is a small, constant spring that emerges along the plane of the limestone formation. It flows a short distance before sinking into the sandy bed of the canyon. In 1950, the author's parents found seven sites on the rim and floor of the canyon. The author subsequently designated these as three separate sites.

24 BW 401, the principal site, is situated on the rimrock bordering the wild, inhospitable canyon. The flat summit of the rimrock is discontinuously covered by a thin accumulation of aeolian sand. Flakes and broken artifacts were found in the sand and on the horizontal planes of the limestone formation. Small, hardy junipers (Juniperus, sp.) have taken root on the formation, but soil has not developed, and of course the site is not stratified. Five side-notched projectile points, several corner-notched points, and two perforators or drills were found (Figure 38; S-43-32, 38).

One hundred yards east of the rimrock formation are

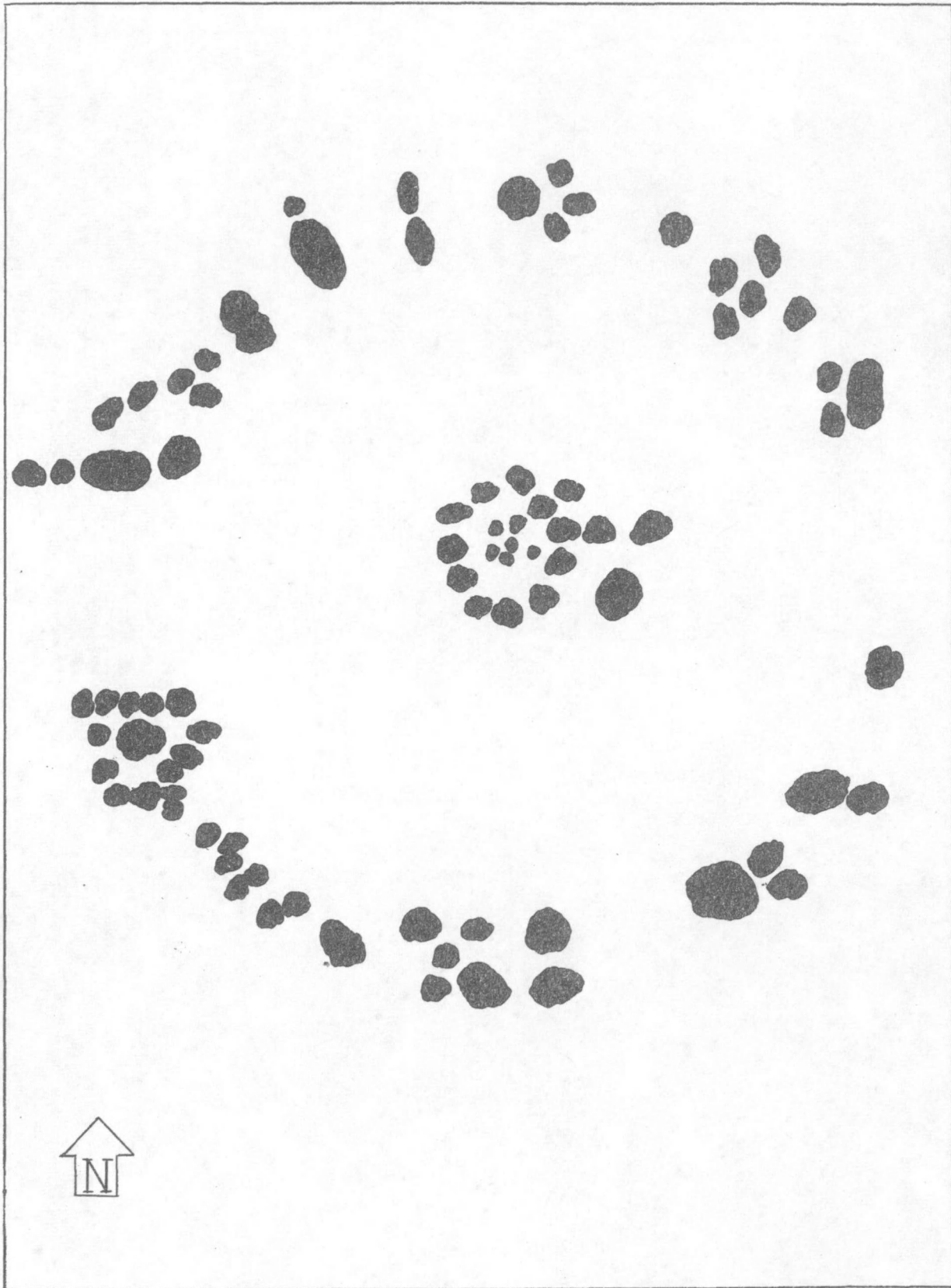
six stone circles. The stones forming these partial circles are so deeply buried that they were not found until January, 1956, even though their exact location had been reported by the former landowner. These features are formed of ten to fourteen stones arranged in horseshoe shaped alignments that are about eight to ten feet in diameter. The taxon "single-course" is used to describe circles composed of a single outline of stones (Malouf 1961b: 382). All three circles are open to the east. The stones seem to be smaller in size than the average cobble usually employed in stone circles, however, their small size might be illusionary, as most of the stones are nearly buried. The rate of soil accumulation on the site is quite low, since nearby plow furrows (known to be at least forty years old) are quite well defined. The deeply buried stones and the small, single-course outline of the circles are features which, taken together, create the impression that these particular stone circles might be older than the majority of such manifestations found in the Gallatin area.

Surface flakes and a few broken implements (knives and one scraper) were spatially associated with these rings, but could not be demonstrated to be culturally or temporally associated (Figure 38, S-42-26, 41). Excavation might reveal something of the function of these arrangements, although attempts to derive such information have been rather unproductive (Malouf 1950: 381-9).

24 JF 401 Ann's Site: This small occupation site is located on a secondary terrace overlooking the Boulder River, a tributary of the Jefferson. The site is crossed by a county road. Basalt flakes and artifacts were found in the roadbed. According to Don Crabtree (Personal communication, May 1964), one of the projectile points found on the site is a Cascade point (Figure 33, S-86-3). These are regarded as a diagnostic artifact of the "Old Cordilleran Culture" (Butler 1962). The site has been destroyed by road construction. Sunlight Cave, excavated by Austin, is located a dozen miles west of this site.

24 JF 402 Boulder Hollow: A single isolated stone circle is situated on a high promontory located immediately west of Ann's site. The cairn-centered construction is symmetrically, if not meaningfully arranged (Figure 31). No cultural material was found in the vicinity of the circle. The function or purpose of this construction remains obscure.

24 JF 403 Cactus Inn Pictographs: These pictographs are located four miles west of the junction of U. S. Highway Ten and Montana Route Forty-one. Two panels of motifs were painted on vertical granite slabs that were geologically derived from the Boulder batholith. The motifs of Panel I have been damaged by aeolian erosion and local exfoliation of the rock surface. Interstices of the rock structure have been stained white by lime leached from the overlying soils.



FIVE FEET

-FIGURE 31-

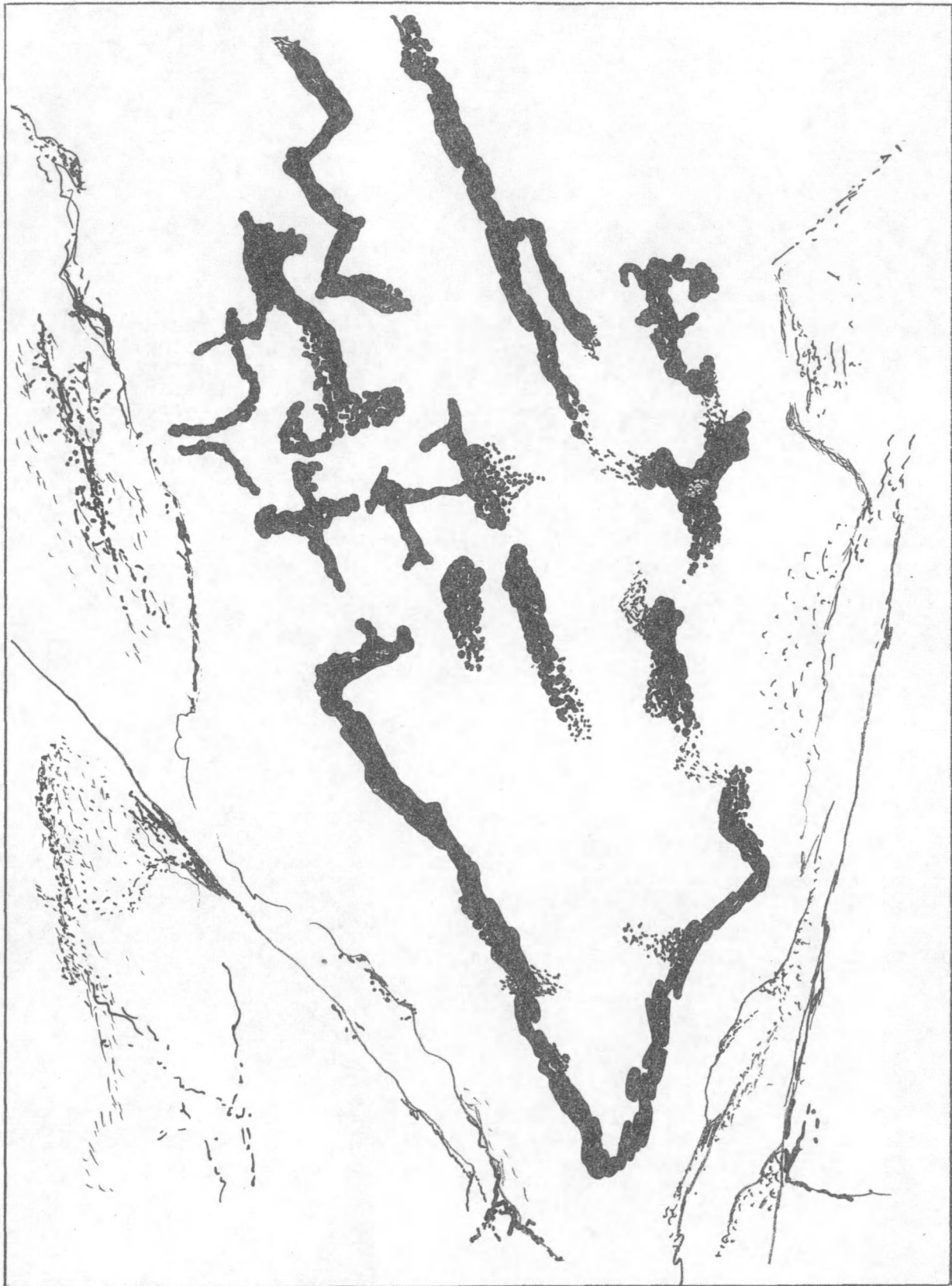
24 JF 402

The stains form unusually symmetrical patterns, one of which resembles an anthropomorphic motif. Perhaps the Indians painted on this surface because they regarded the "anthropomorphic" pattern as significant. Malouf (1961a: 9) reports that "Baptiste Mathias, an elderly Kutenai, believed that the nipeeka, or spirits initially inscribed the rocks."

Pictograph Motif I is a semi-abstract design (or, at any rate, so it appears at present). Located on the most sheltered portion of the rock surface (Figure 32), it is probably only a remnant of a much more extensive pictograph.

Panel II, situated forty feet west of Panel I, is composed of a few pictographs executed in the usual red color. The only discernible motifs are a series of short, vertical "tally" marks. It is no longer possible to stand beneath this panel: the ledge beneath it has fallen into a deep gorge. The advanced state of erosion might indicate that the pictographs were painted some time ago, however, the rate of erosion in the gorge may be extremely rapid.

An excellent firehearth was exposed in the nearly vertical wall of the eroded gorge, approximately twenty feet east of Panel I. The hearth is located in the A-2 horizon, some twelve to fourteen inches beneath the surface. Most of the hearth stones have fallen into the gorge. A limited test disclosed ash, burned bone, and heat-cracked, blackened rocks. Samples may be associated with the pictograph panels, but this possibility would be difficult, if not impossible,



SIX INCHES

24 JF 403

-FIGURE 32-

to demonstrate.

Among the known pictograph sites found in this locality are three panels situated in the remote Whitetail Deer Creek drainage north of Whitehall. Most of these pictographs were painted on granite boulders, the surfaces of which are rapidly exfoliating.

Yellowstone Drainage

Sites found in the Gallatin, Madison, and Jefferson River valleys have been described without significant interruption in environmental continuity. The first site in the following series is located in the Shields River Valley, about thirty miles north of Livingston, Montana. Subsequent sites will be described in sequence from north to south, progressing upstream along the Yellowstone River toward Yellowstone National Park. The first site in the following series is located in a portion of the Gallatin area drained by the Yellowstone River.

24 GA 302 Sedan Site: The Sedan occupation site is located in the upper Shields River drainage basin in the extreme northeast periphery of the survey area. Fifty flakes of chert and basalt were found in the surface of this small site, but Pinyon Quartzite flakes, common in the lower

Shields River drainage (Cf. 24 PA 322), are absent in the samples collected by members of the field party.

24 PA 321 Wilsall: In 1949, the author surveyed the lower Shields River valley. On the foothills west of the river, in a plowed field located near a series of small springs, the author and members of the field party found artifacts, flakes, and faunal remains. The latter mostly consisted of well-preserved bison bones (Bison bison). Local collectors assert that they have found articulated bison bones in the strata beneath the plowzone. If this is true, it is possible that bison were killed here, rather than at a nearby drive. Thus, this site might be a "bison kill." Nevertheless, the Wilsall site has served as an occupation area, since dozens of knives, drills, and scrapers, as well as projectile points, have been found in the plowed earth. Tools or implements are not usually found in the bone deposits of kill sites and bison drives. According to Forbis (1962: 46), "you get everything [in bison drive deposits] you get in a campsite, except there would be a much smaller percentage of tools in relation to projectile points."

One of the largest collections of artifacts found on the Wilsall site is in the hands of Milt Siebler, who wrote a brief account of his activities at the site, reporting the existence of what seemed to him to be a drive line, buried three or four feet beneath the surface of the site. He

observed that while the nearby Shields River often freezes over during the winter, some of the springs located near the Wilsall site are usually free of ice. His collection includes many side-notched projectile points, several corner-notched points (some of which are similar to Besant points), and a few stemmed "Hanna" points. The side-notched specimens convex-blade straight-base points are usually less than three-quarters of an inch in length. The author was a late arrival at the site, in terms of the depletion of its material culture: he found only very small side-notched projectile points and a dozen "un-notched" triangular points (Figure 33) representing a type often found in association with side-notched points (Cf. Forbis 1957: 129 Pl. 1: Nos. 26 and 27).

A spring located near the plowed field has eroded a channel approximately four feet deep. In the bed of the spring the author found an ovoid knife, three large flakes, and a fragment of burned, mineralized bone. The flakes are three inches long; much longer than any found in the plowed field, and are made of a type of chert exotic to the site. This material could represent a separate, perhaps earlier occupation of the Wilsall site. Unfortunately, projectile points were not found.

The Wilsall site exhibits serial occupation. At various times in its history it has served as an occupation site, a kill site,--and a wheat field.

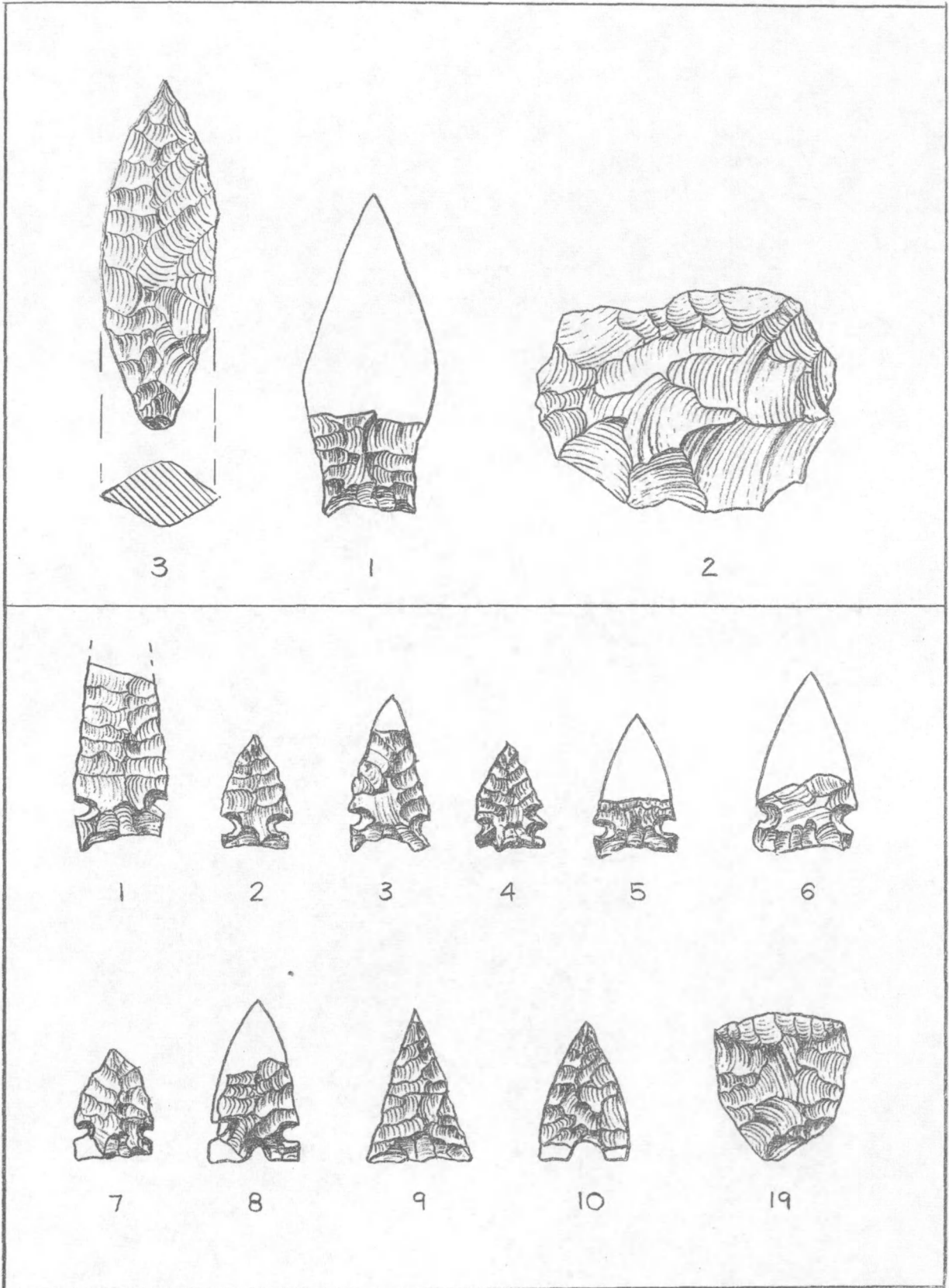
Figure 33

24 JF 401 (S-86)

3. Type 4, brown CY
 1. Type 10, basalt
 2. Scraper Type 2, red quartzite
-

24 PA 321 (S-70)

1. Type 22, white quartzite
 2. Type 19, black obsidian
 3. Type 22, black CY
 4. Type 19, brown CY
 5. Type 21, basalt
 6. Type 21, white chert
-
7. Type 19, dark CY
 8. Type 22, white chert
 9. Type 20, basalt
 10. Type 20, basalt
 19. Scraper Type 2, CY
-



INCH

UPPER 24JF401
LOWER 24PA321

- FIGURE 33 -

24 PA 322 Clyde Park: In 1959, members of the survey party examined a small occupation site located within the town of Clyde Park, Montana. The lithic sample consisted of more than 400 flakes of Pinyon Quartzite. This material is scarce at 24 PA 321, six miles north of Clyde Park, but is plentiful at 24 PA 324, located approximately twenty miles south of Clyde Park. Point hunters are said to have found numerous specimens on the surface of the site: members of the field party found none.

24 PA 323 Carter Bridge Pictographs: Ten miles south of Livingston, Montana, the Yellowstone River flows through a narrow canyon formed by high limestone cliffs. Several pictographs appear on the base of a prominent cliff located west of the river. The site is located west of the Leo Rang ranch, at the junction of U. S. Highway 87 and the Trail Creek road. When the author's mother observed these pictographs in 1920, they were clearly visible from the Trail Creek road. During the summer months the panel is obscured by the leaves of a dense stand of cottonwood trees growing at the base of the cliff. At present, the pictographs are virtually indistinguishable at any time of the year.

In 1958, the author compared Munsell color standards with the hues of the motifs. (Red; hue 2.5 YR, value/chroma 4/6.) This experiment will be repeated in the future, provided, of course, that the pictographs escape vandalism. It

is possible to state that the pictographs have faded during the past few decades. The previous intensity and rapid deterioration of these motifs suggests that they might be of recent origin. Mulloy (1958: 119) observed that the most recent aboriginal paintings in Pictograph Cave were "done in a peculiar red which is brighter than the usual red."

The tracings reproduced in Figures 34 and 35 were made in April, 1958, and are somewhat more accurate than the drawings made by the author in 1948. Two of the motifs are "shield-bearing" anthropomorphic figures. A third motif, probably anthropomorphic, is not a "shield" figure (Figure 35). A motif resembling an over-sized human hand print is located some ten feet above the ground.

"Shield" motifs are common on many pictograph panels: frequently associated with the motif is a device or appendage depending from a weapon (?) which projects at an oblique angle from behind the "shield" (Figure 34). (Cf. McCracken 1959: 136, 139, 163, and 171.) The shield motif appears in Pictograph Cave (Mulloy 1958: 126, Fig. 42), and is widely distributed throughout Wyoming and Colorado (Mulloy 1958: 121-22), where it is associated with the Fremont Culture (Wormington 1955: 106-65). The author has observed similar motifs in the Chalifant petroglyphs located in the Owens Valley, California.

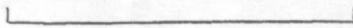
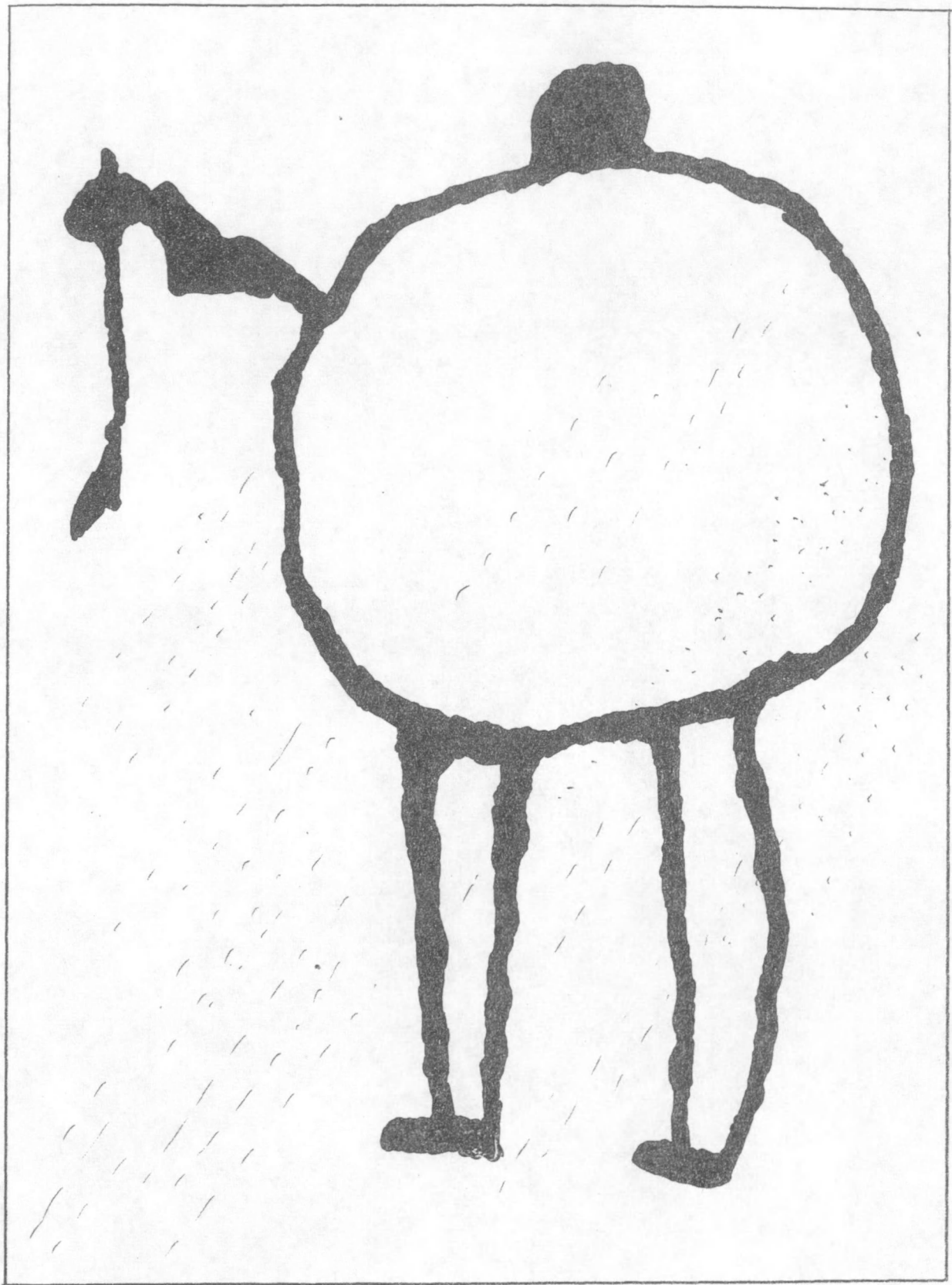
24 PA 324 Maxey Site: The Maxey Site is located about

thirty miles east of Bozeman, in the valley of Trail Creek, a tributary of the Yellowstone River. The site is several miles east of the boundary of Gallatin County, but it is included in this report because the locality is a source of lithic material, flakes of which are found on sites in the Gallatin Valley.

The location of the site has been known since 1910, if not earlier. The Washburn-Langford-Doane Expedition, enroute to Yellowstone National Park, camped on or near this site in 1870 (Mary Doane, personal communication, 1947). The Hayden party also camped near the site in 1870 (Hayden 1872: 53). The valleys of Meadow Creek, a tributary of the east Gallatin River, and Trail Creek, which flows into the Yellowstone, formed the principal route to Yellowstone National Park prior to the construction of U. S. Highway Ten through Bozeman Pass.

The Maxey site may be considered as four discrete entities, although all could be components of a single archaeological manifestation. These are: (1) an interment, (2) an occupation site, (3) a series of stone circles, and (4) a source of lithic material.

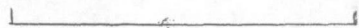
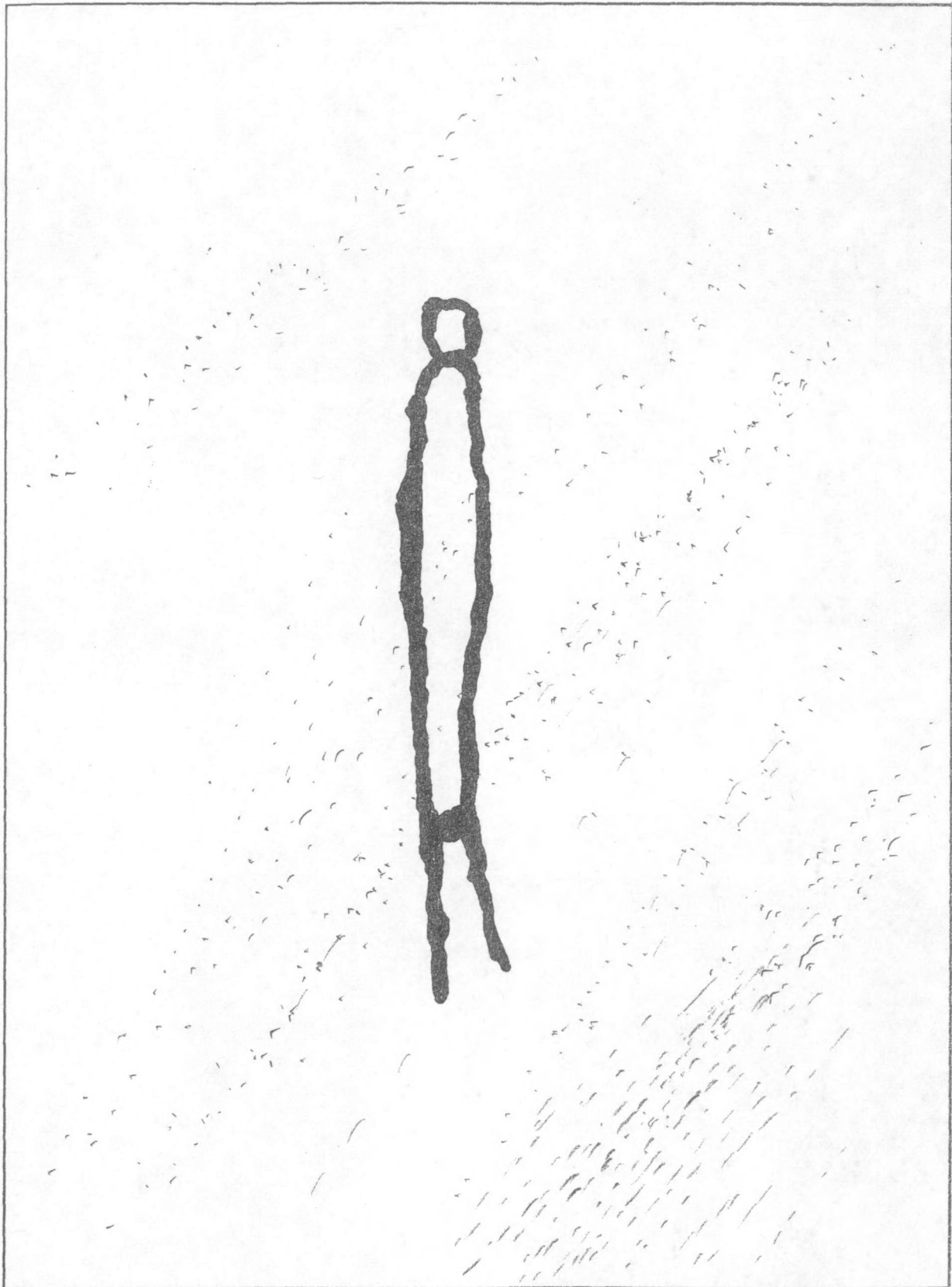
These features are found on three stream-cut terraces located on the north bank of Trail Creek. The interment, situated on a promontory of the highest terrace, was covered by a large pile of rocks. In 1920, a party of local residents and visitors exhumed the burial. A member of the party



ONE FOOT

24 PA 323

- FIGURE 34 -



ONE FOOT

24 PA 323

- FIGURE 35 -

recalled finding "three or four little pots of red paint or powder" associated with the well-preserved skeleton of a mature individual. One of the projectile points found near the skeleton is said to have been about four inches long, light tan in color, and "thin" in cross-section. It had a "square" base, and its surface was "old and weathered." Most of the other projectile points found in the grave were "small and notched," but the informant could not recall whether they were side-notched or corner-notched. Members of the party removed the artifacts and covered the skeleton with the earth and rocks which had overlain it. The rocks were described as "county rock;" none were "larger than could be easily lifted." Warren Ferris (Phillips 1940: 148) observed that in Idaho, the Indians sometimes placed rocks on interments:

3 wounded Indians died and were decently buried (sic) they were enveloped in skins lashed around them previous to interment, and their graves after being filled with earth, were surrounded by little comical (sic) heaps of stones, which is the only mark [of] the resting place.

The Park County road department has destroyed the promontory upon which the grave was situated. The secondary terrace, crossed by the county road, might have been an occupation site: the surface is littered with numerous flakes of quartzite. Five stone circles are located on the terrace. In 1948, the author mapped the circles, two of which have since been destroyed during the course of logging operations.

Trail Creek has eroded a steep vertical cutbank in the primary terrace, the exposed stratigraphy of which consists of an A-horizon loam eighteen inches thick, superimposed on a B-horizon clay of comparable thickness. The clay overlies C-horizon alluvial gravels unconformably imposed on glacial till. Cultural material was found only in the A-horizon.

On the surface of the terrace are four stone circles. A few flakes were spatially associated with these features. In 1942, the Maxey brothers built a road across the surface of the terrace. Fortunately, they deliberately avoided damaging the stone circles. Fragments of post-cranial bone found in the shallow roadcut have been identified as Bison bison.

One of the stone circles located on the primary terrace was quite symmetrical. In 1948, the author tested the interior of this feature. Unfortunately, nothing was found other than numerous cobbles or "county rocks" smaller than the stones used in construction of the circle. Scattered stones located 150 feet east of the test pit were collectively designated as "Ring One." Excavation revealed that these rocks did not form a discernible stone circle. A single triangular-shaped side-notched projectile point made of black obsidian lay in the grassroots (Figure 36, S-50-22). Two corner-notched points (S-50-7, made of basalt; and S-50-9, made of brown chert) were found six inches below the

surface in the A-horizon strata (Figure 36). (The author assumed that these corner-notched projectile points were older than the side-notched points found by C. A. Kinsey in the Emigrant Bison Drive.) A few flakes were found approximately twelve inches beneath the surface. When the underlying B-horizon yellow clay was encountered at a depth of fifteen inches beneath the surface, the test was discontinued.

Forty pieces of bone were found in the A-horizon strata. The largest fragment was less than four inches long; the majority were much smaller. These broken bones suggest that the butchering techniques practiced by the occupants of this site were similar to those evinced in the faunal remains found in the occupation site associated with the Madison Bison Drive (24 GA 314). A single piece of bone had been modified--perhaps for use as a drill or awl (Figure 36, S-50-15). This specimen is the only bone tool found by members of the survey party in the Gallatin area.

The flakes found in the test pit mostly consisted of quartzite. Conversely, all of the projectile points and several of the implements were made of other varieties of lithic materials. (The possible significance of this situation is considered in Chapter VIII.) Pinyon Quartzite is the most abundant lithic material found at the Maxey Site; it might have been rafted into the Trail Creek drainage during glaciation of the Paradise valley. This material

exhibits a wide color range: yellow, brown, and white hues predominate; red, deep brown, and black also occur. The color of the material seems to be of little significance; many small flakes are multicolored. The extensive utilization of Pinyon Quartzite is interesting, in view of the proximity of the site to the obsidian deposits located in Yellowstone National Park. Obsidian flakes comprise less than ten percent of the lithic samples collected at the Maxey Site.

Pinyon Quartzite is common on the surface of two sites located three miles and six miles east of the Maxey Site. Twenty miles northeast, at the Emigrant Bison drive, of 269 side-notched projectile points found by Arthur, only thirteen were made of quartzite (Arthur 1962: 24). Quartzite artifacts were found at the Eagle Creek site, located about fifty miles northeast of the Maxey Site. Pinyon Quartzite obtained at the Maxey Site was transported some twenty miles west to site 24 GA 310, located in the Gallatin Valley. At this site, however, Pinyon Quartzite composed only 3.4 percent of the lithic material. Only an occasional fragment of Pinyon Quartzite is found on sites located farther west, in the central Gallatin Valley.

Four of the projectile points found on the second and third terraces were typologically representative of the Early Period. These specimens (Figure 36, S-50-16, 17, 18, and 20) resemble projectile points found on the Red Lodge site (Mulloy 1943, Fig. 20, C, Nos. 4, 5, 6). One of the Maxey

Site specimens (S-50-17) is comparable to projectile points found at the Carbella Site. Similar projectile points have been found in the lower levels of the Eagle Creek Site (25 PA 325). The Maxey Site specimens have been examined by William Mulloy, who equated some of them with the Agate Basin assemblage found in Wyoming.

Agate Basin and Hell Gap projectile points are widely distributed in Montana and Wyoming (Agogino 1961: 558). The Hell Gap Site at Guernsey, Wyoming, has a radiocarbon date of 10,850 years (Agogino 1961: 558). According to Agogino and Rovner (1964: 240): "Today the Hell Gap point, dated by radiocarbon to about 9000 B.C., must be considered one of the New World's oldest point types." Agogino postulates that Hell Gap, Agate Basin, and other projectile points of the so-called "Plano complex" form a tradition. In the experience of the present author, the chronological sequence probably should begin with Agate Basin points, followed by Hell Gap points, which in turn might have been succeeded by the side-ground lanceolate points of the Carbella and Maxey Sites.

The Maxey Site was revisited in 1958. The backfilled Ring One test pit was completely overgrown. The site was re-examined in 1960: no alterations had occurred, except that two stone circles had been destroyed. The author examined the eroded cutbanks along Trail Creek, but found no indication of deeply buried cultural material.

The Maxey Site was investigated, in 1947-8, in order

Figure 36

24 PA 324 (S-50)

- 21. Type 22, black obsidian
- 22. Type 23, black ignimbrite
- 7. Type 16, basalt
- 9. Type 16, brown CY

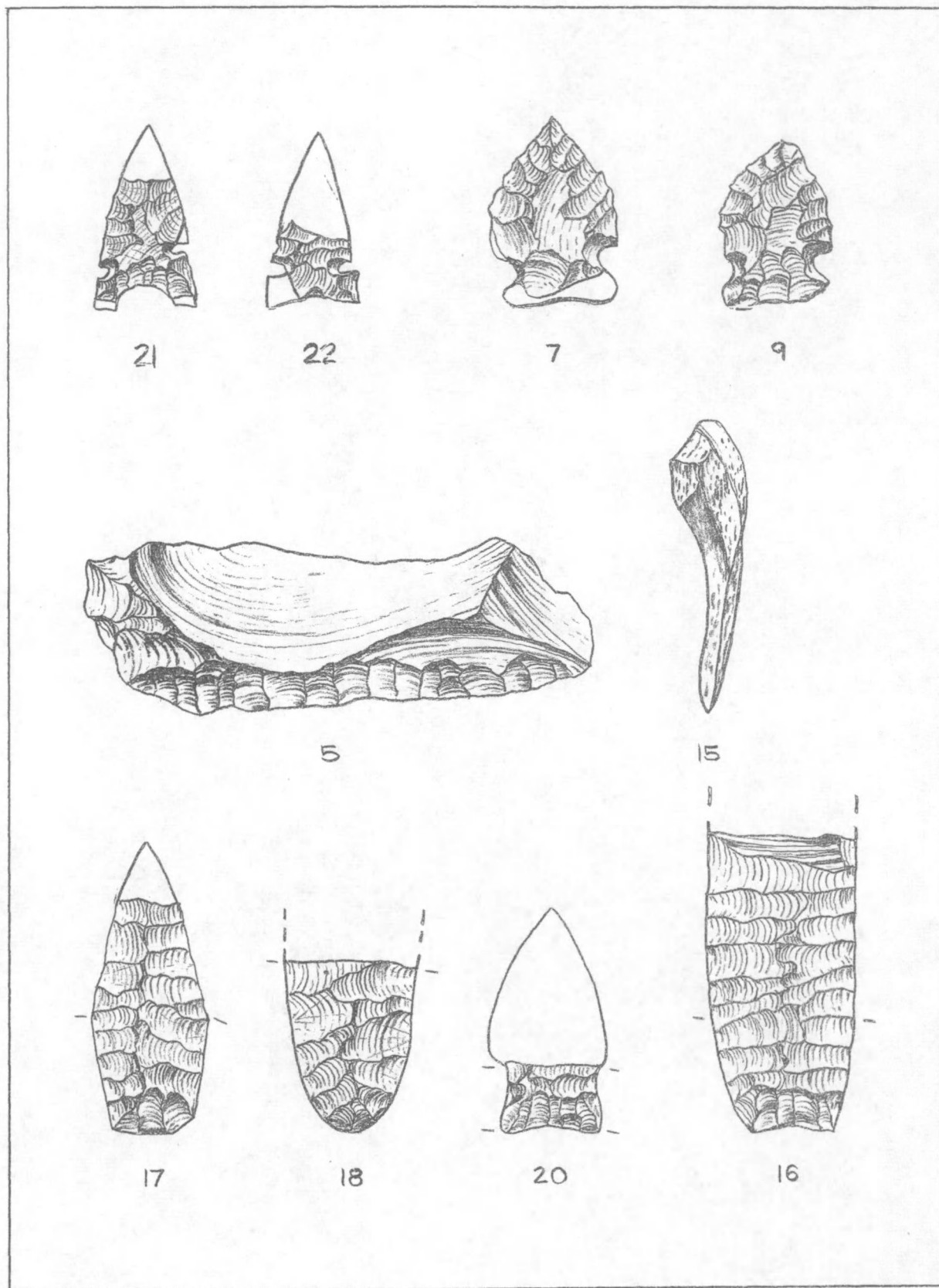
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- 5. Scraper Type 5, brown CY
- 15. Perforator Type 3, bone

—————

- 17. Type 5, black ignimbrite
- 18. Type 5, black ignimbrite
- 20. Type 10, black ignimbrite
- 16. Type 2, agate

—————



INCH

- FIGURE 36 -

24 PA324

to test the hypothesis that the stone circles were in fact tipi rings. No evidence was obtained to either confirm or refute this possibility. The author is continuing investigations in this locality.

24 PA 309 Emigrant Bison Drive: The author investigated this site in 1948. It was subsequently examined by George Arthur. In deference to Arthur's intention of reporting the site in detail, the manifestation will be described in this study only in order to facilitate comparison of some of its features with those of certain bison drives found in the Gallatin Valley.

The site is located near the old stage station of Emigrant, Montana. There are two adjacent bison drives. The larger (the Emigrant Drive) is said to have been used by the Indians as recently as 1875 (Brackett 1892: 577-81). The drive deposit was tested by Barnum Brown (1932: 80), and, circa 1930, by C. A. Kinsey. Mulloy (1958: 154) mentions that more than 1500 side-notched points have been found in the drive deposit, however, very few corner-notched points have been reported found (Plate IV, Photo 6).

24 PA 308 Story Bison Drive: A plateau basalt forms the drive cliff of the Story Drive, a small site located some 800 yards south of the Emigrant Drive. Many of the bison driven from this low cliff could have survived the fall; consequently, the Indians built an enclosure around the deposit

area. This structure duplicates the deposit enclosure located at the Hot Springs Drive (24 GA 311) in the Gallatin Valley. Since many bison bones have been found outside the barrier, it might not have been very effective. This possibility might be of interest to readers of the Buffalo Jump Symposium panel discussion (Malouf and Conner 1962: 40-56). On the other hand, it is possible that the enclosure was built after the drive had been in use for some time.

The Story drive is significant because both side-notched and corner-notched projectile points have been found in the drive deposit. The author found similar corner-notched projectile points in the lowest levels of several bison drives located on the Northwestern Plains (Napton 1964b: 124, Photo 11:3,4). Davis (Personal communication 1964) discovered comparable corner-notched projectile points in a bison drive located in the environs of Havre, Montana. Arthur (1962: 21, Figure Nos. 1 and 2) found several corner-notched projectile points in the Story Drive deposit: these projectile points may be one of the early types of corner-notched points found in Montana bison drive sites. The designation "Emigrant Point" is tentatively proposed for this type of projectile point (Neuman 1965: 299).

Various observers believe that the Story Drive is older than the Emigrant Drive. Arthur (1962: 26) suggests that the site was used "as early as 0 A.D." (sic). The present author had concluded that the Story Drive is the

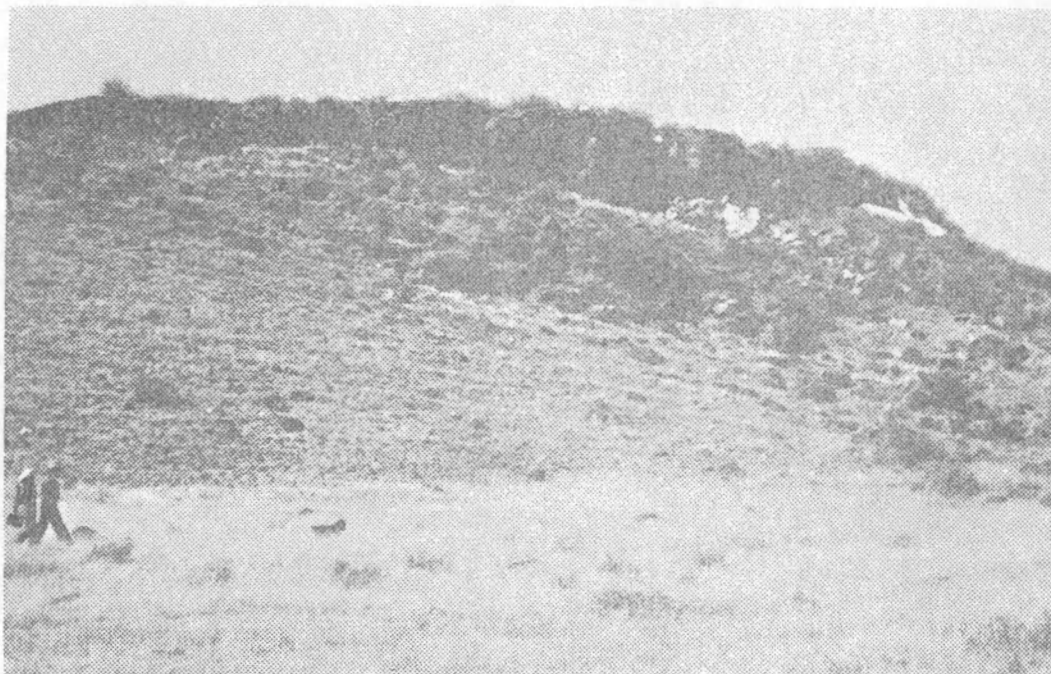


Photo 6. 24 PA 308: Emigrant Bison Drive in 1949.
Photo looking west toward the drive deposit.

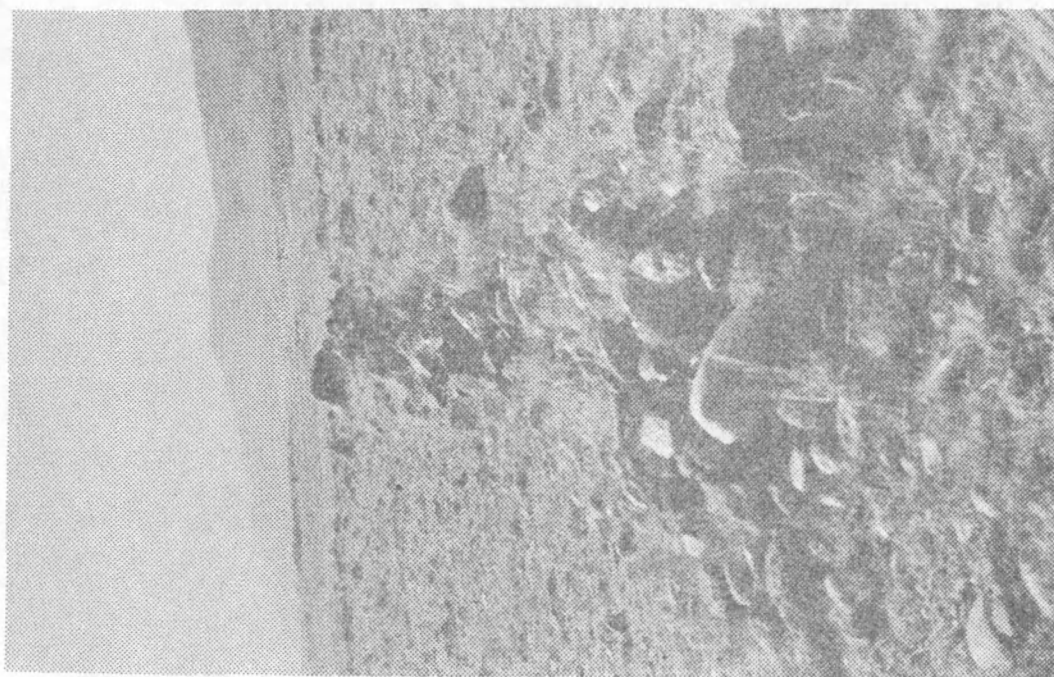


Photo 7. 24 PA 308: Emigrant Bison Drive, south drive
line. Looking northwest. Photo taken in 1951.

older of the two sites, since the continuous drive lines of the Emigrant Drive diagonally intersect, and obviously supercede, the discontinuous Story Drive lines. The south line of the Emigrant Drive is a continuous low "wall" averaging some twelve inches high. (The usual drive line, of course, consists of a series of small cairns.) The Emigrant and Story drive lines are remarkable examples of aboriginal cooperative endeavor. These features merit careful preservation (Plate IV, Photo 7).

24 PA 325 Eagle Creek: Eagle Creek is a multiple-component stratified occupation site located near Gardiner, Montana. In 1957, the site was tested by Don Bostwick, the author, and members of the Livingston group of the Montana Archaeological Society. Test Pit I disclosed three cultural levels (Plate V, Photo 8) identified by: (1) side-notched projectile points and sherds of flatbottom pottery, found in an occupation level some eight inches beneath the surface; (2) corner-notched projectile points, found in a level approximately twenty-four inches beneath the surface; and (3) side-ground projectile points resembling Agate Basin points, found in a strata thirty inches beneath the site surface. Unfortunately, representative specimens of these projectile point types are not available for illustration.

24 PA 326 Old Kentuck Cave: This cave is locally known as "Old Kentuck," a suitably intriguing appellation for

an archaeological site. The cave is situated in a hanging valley located on the flank of Baker Mountain. The view from the cave overlooks the deep canyon of the Boulder River, a tributary of the Yellowstone: the aperture of the cave is readily visible from the valley floor. "Old Kentuck" was unsuitable for domestic occupation, since it is located 900 feet above the valley floor; the nearest source of water is located at least 500 feet below the cave entrance; and the bedding plane of the cave formation dips fifty degrees south, causing the cave floor to slope steeply from the interior to the entrance.

A limited test of the cave deposit failed to disclose archaeological material. The cave may not have been a domestic site, but it was certainly utilized by the Indians, since several pictographs appear on the west wall of the cavern. The red paint stained or penetrated the limestone to a depth of 0.5 millimeters. Perhaps the pigment was carried in an organic vehicle, such as oil or blood. Five motifs are distinctly visible; none are superimposed or connected (Figure 37). The dominant motif may be approximately described as resembling a "sun-symbol." Directly below this motif is an anthropomorphic figure; below and to the left is a zoomorphic motif; to the right of the central anthropomorphic figure is a design shaped rather like a turtle. These juxtaposed motifs are of uniform size, hue, and intensity. Perhaps they were painted at approximately

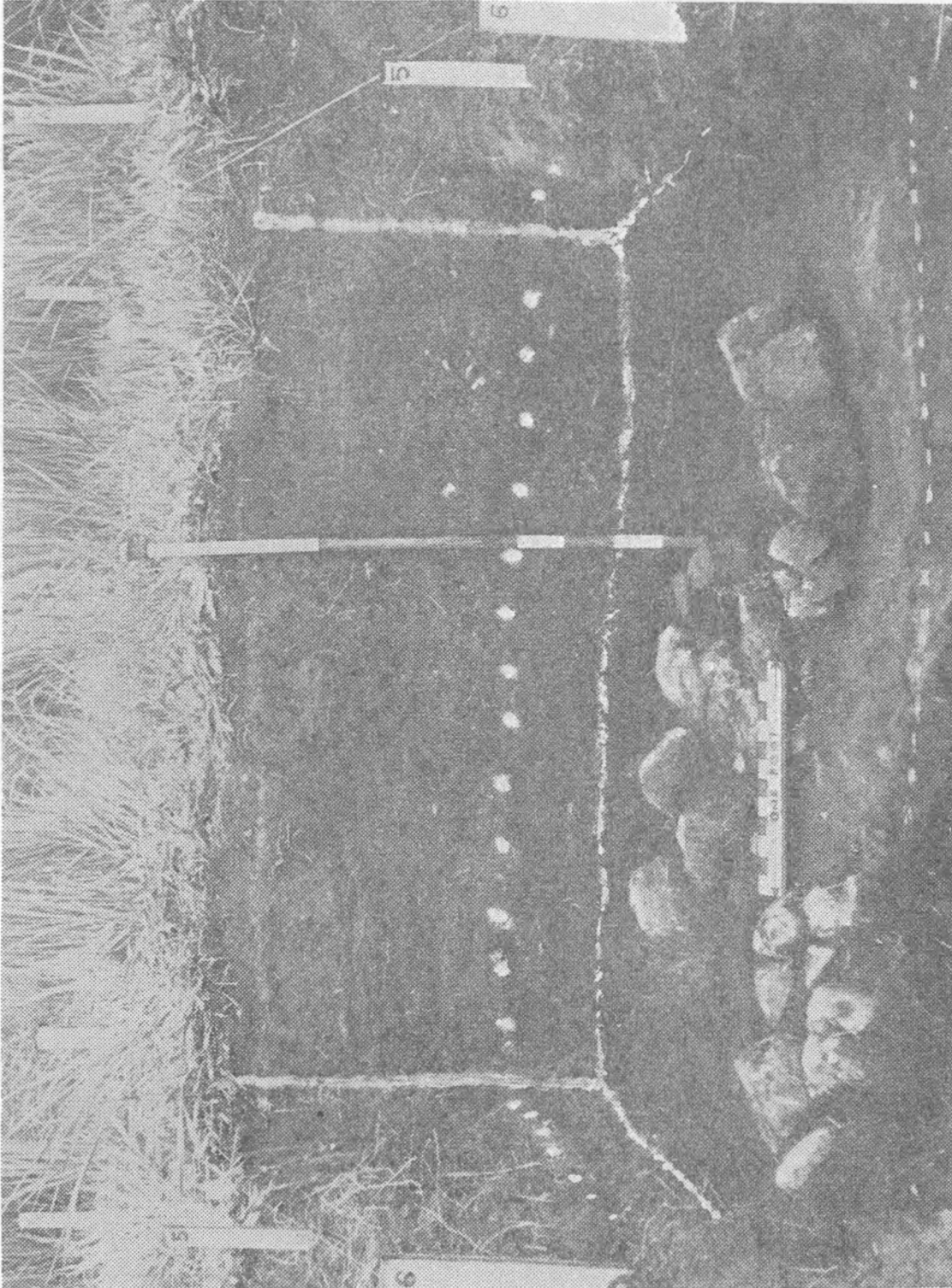
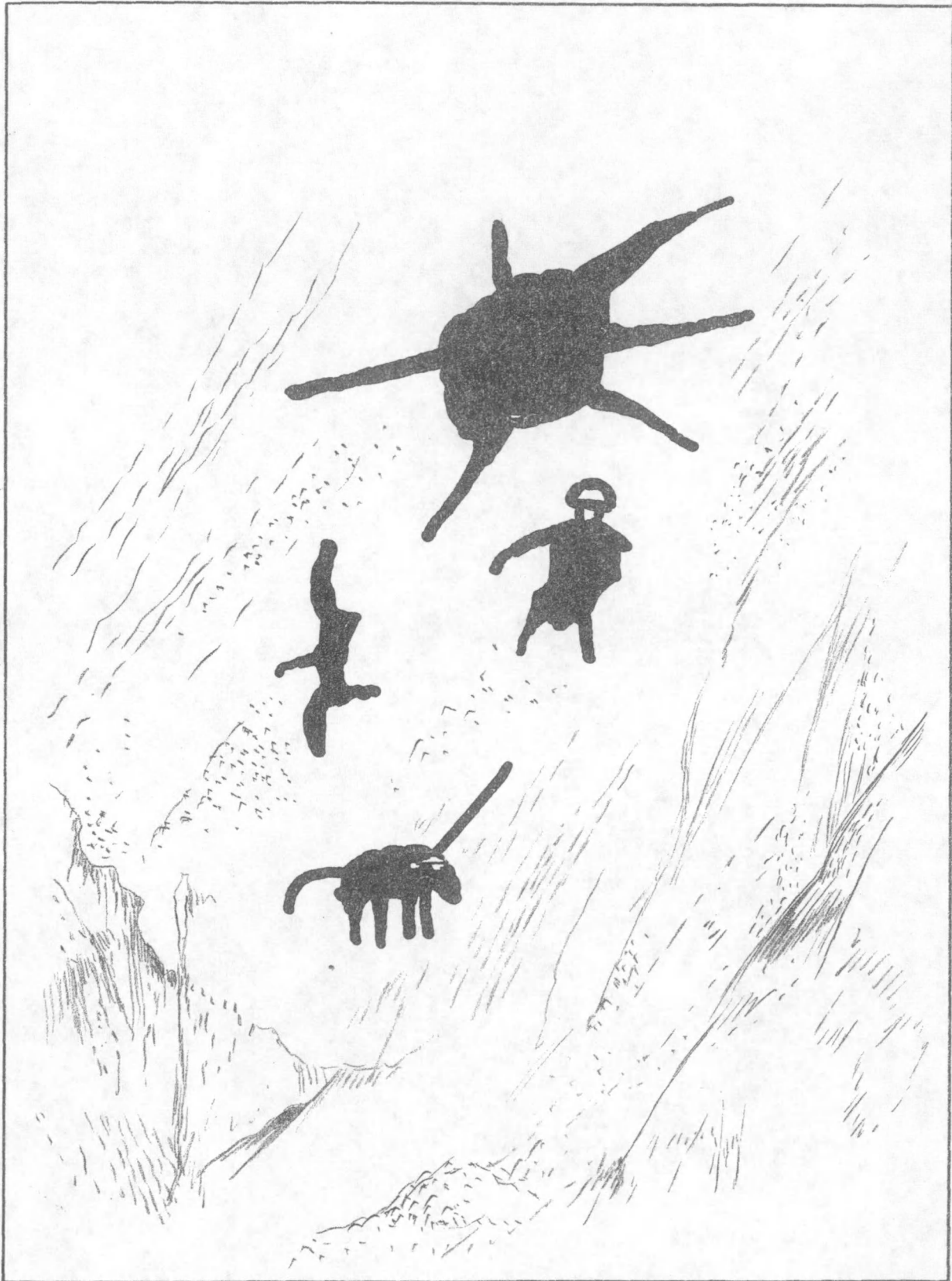


Photo 8. 24 PA 325: Eagle Creek Occupation Site. Test Pit One, stratigraphy. Photo includes Feature 7, a large firehearth.

the same time. They are similar to "Type I" pictographs found in the Montana Western Region (Malouf 1961a: 1). The zoomorphic motifs are reminiscent of "Type I" motifs in the superimposed pictographs located near Dinwoody, Wyoming (Gebhard and Cahn 1950: 221).

Old Kentuck Cave is spectacularly situated and the pictographs are well executed, but the cave seems to be devoid of archaeological material.

The author has completed formal description of forty-five representative sites found in the Gallatin area. The lithic material and artifact typology will be discussed in the following chapter.



SIX INCHES

- FIGURE 37 -

24 PA 326

Figure 38Gallatin Area Sites

S-49-1. 24 GA 308, Type 5, white quartzite

S-45-5. 24 GA 314, Type 8, opalized wood

S-41-10. 24 GA 322, Type 5, basalt

S-43-38. 24 BW 401, Perforator Type 2, brown CY

S-42-32. 24 BW 401, Perforator Type 1, agate

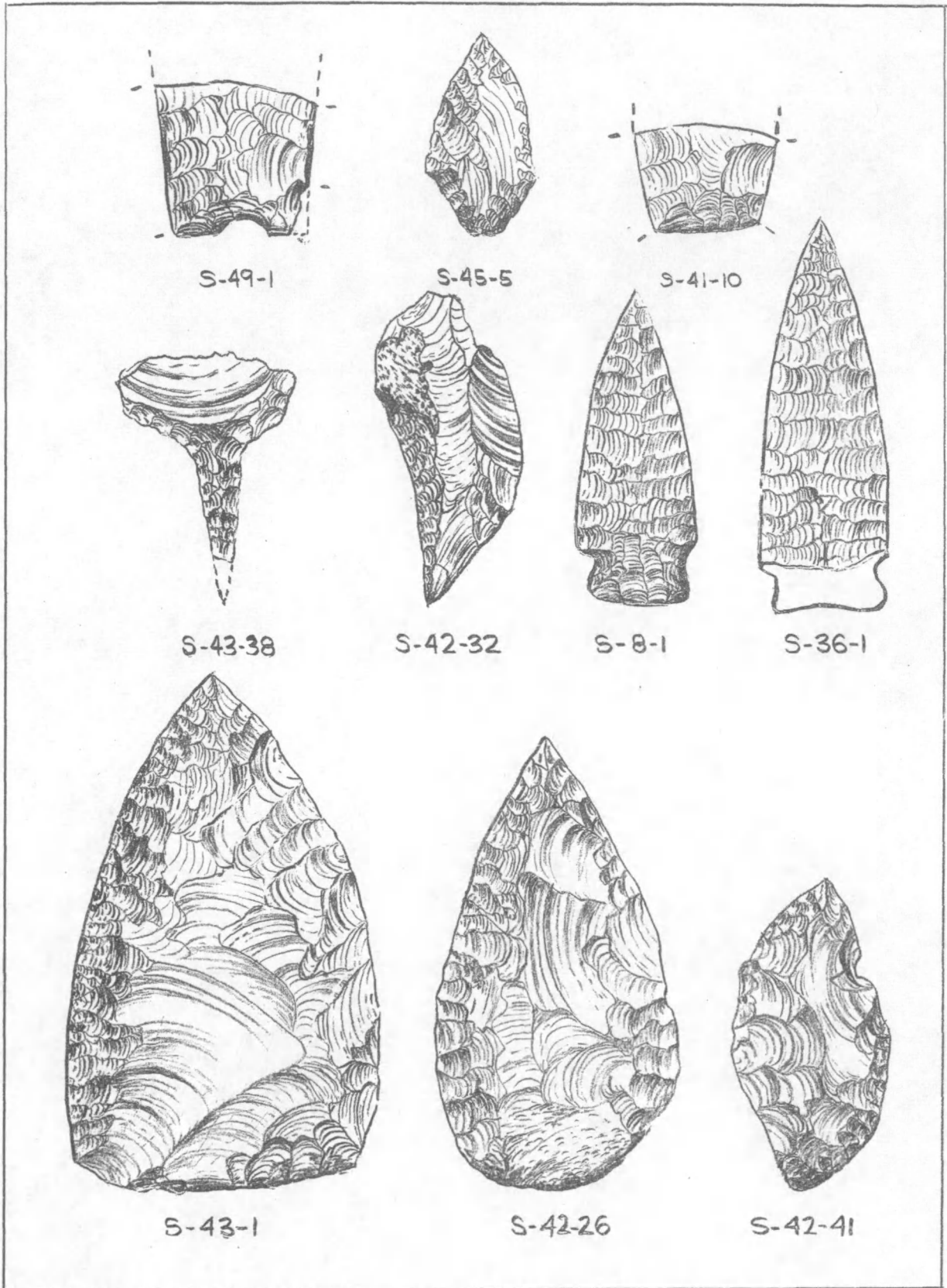
S-8-1. 24 GA 318, Type 12, brown CY

S-36-1. 24 PA 308, Type 12, tan chert

S-43-1. 24 GA 315, Knife Type One, black ignimbrite

S-42-26. 24 BW 401, Knife Type Two, brown CY

S-42-41. 24 BW 401, Knife Type Five, brown CY



INCH

-FIGURE 38-

VARIOUS SITES

CHAPTER VII

THE ARCHAEOLOGY OF THE GALLATIN AREA: DESCRIPTION OF MATERIAL AND ARTIFACTS

Materials: The artifacts found on the surface of Gallatin area sites were made of lithic materials. An exception, of course, is the bison bone awl found on the Maxey Site. A greater variety of materials would have been preserved had the material culture been protected from moisture; for among the artifacts found in the dessicated deposit in the Point of Rocks Cave (24 MA 305) were a mocassin made of deer (?) skin, wooden arrowshaft fragments, and various objects made of vegetable fiber.

Description of Lithic Materials: Complex sedimentary and igneous formations occur in the mountains adjacent to the Gallatin Canyon, as well as in the eroded foothills surrounding the Gallatin Valley. Material suitable for modification into artifacts is found in these formations, and in the fluvial deposits located along most of the streams draining the canyon and valley.

Two major families of rock provide material suitable for flaking: these are igneous rocks, including obsidian, ignimbrite, and basalt; and sedimentary rocks, such as quartz, chalcedony, and chert. These materials, and the uses most

frequently made of them, will be described in the following pages.

Obsidian is a volcanic glass commonly found in Yellowstone National Park. Ignimbrite, although similar in composition, is readily distinguished from obsidian by its lack of translucency. Ignimbrite is black or rufous; obsidian varies from deep black through grey-black to a very light blue-grey; red, light-grey, green, and brown hues sometimes occur. There are no known sources of obsidian or ignimbrite in the Gallatin area.

Nodules of fine-grained basalt are commonly found in the Gallatin Valley; there are several basalt outcroppings in the upper Gallatin Canyon. Hundreds of projectile points made of basalt have been found in the Gallatin area.

The cryptocrystallines found in the survey area include relatively coarse-grained material such as Pinyon Quartzite; amorphous chalcedony and agate; and micro-granular crystallines such as chert and jasper. Chalcedony frequently exhibits a wide range of color: brown, yellow, tan, white, and green flakes are common--less so, however, in the order in which they are listed. Corner-notched points were often made of chalcedony or chert. Early Period projectile points were made of agate and various exotic materials that were not often used during later periods.

Small projectile points were sometimes made from opalized wood. Large pieces of this material frequently contain

dark-brown bands representing the grain of the original wood; consequently, the fracture is hackly, and the material difficult to flake.

Small knives were commonly made of obsidian and fibrous chalcedony, but scrapers, large percussion-flaked knives and similar implements were usually made of poor-quality material, perhaps indicating their relative expediency and expendability. Scrapers were not often made of obsidian, since this material is quite brittle. Coarse-grained quartz was sometimes used in the fabrication of large knives. Large skinning tools found in the Montana Western Region are often made on fragments of argillite, slate, shale, and other materials exhibiting fissility, but none of the implements found in the Gallatin area were made of these materials.

The Indians made projectile points and implements from siliceous siltstone, or mudstone, a sedimentary material found in abundance in eastern Montana (Cf. Davis and Stallcop 1965: 14-5). Members of the survey party found a few artifacts made of siliceous siltstone, but flakes of this material were absent in the Gallatin area.

Mauls, pestles, edge-ground cobbles, and certain milling stones were made of fine-grained silic rock and sedimentary rock such as limestone. Onyx, obtained in the "Horseshoe Hills" northwest of Bozeman, was used to make cylindrical "roller-shaped" artifacts that might have served as milling stones.

Earthenware pottery was made of alluvial kaolinite obtained from fluvial or littoral deposits, cooking vessels were carved from steatite (Wedel 1961: 273). This metamorphic material has a hardness-rating of one on Moh's scale, however, when exposed to fire, it hardens to a density rating of four or five. (Incidentally, the Indians probably perceived that if steatite vessels hardened upon exposure to fire, vessels made of clay might also harden when fired.) The author found a tubular pipe made of steatite. (Pipes made of red catlinite, a stone quarried in Minnesota, have not been reported found in the Gallatin area.)

Hematite, or oxide of iron (known in its earthy variety as red ochre) is found in many localities in the Gallatin Valley. Red ochre was used in painting most of the pictographs found in the Gallatin area.

Lithology: Some of the more common lithic materials found in the survey area are briefly described below. (Cf. Leet and Judson 1959: 474-83). The symbols used in the lithic material charts are listed in the left-hand column:

Igneous

- | | | |
|---|-------------|---|
| O | Obsidian: | Translucent glass, smoky-white to smoky-black, red, grey, and green varieties. |
| I | Ignimbrite: | Vitriform, but not transparent in thin fragments. Black, red, grey. Crystobalite inclusions common. |

B Basalt: Fine structure. Grain perceptible to naked eye. Black and grey-black varieties.

Coarse Crystalline Sedimentary

Q. Quartz: Coarsely crystalline. White, yellow, and grey. Poor flaking characteristics.

PQ Pinyon Quartzite: Fine crystalline structure. White, yellow, brown, red, tan, brown.

Cryptocrystalline

CY Chalcedony: Waxey, brown, translucent; often found as nodules.

A Agate: Alternate curved layers of chalcedony and opal.

Granular

F Flint: Dull to dark brown, black. Fibrous.

C Chert: Light colored flint. Dull lustre.

J Jasper: Red chert, hematite inclusions.

Miscellaneous Materials

OW Opalized Wood: Amorphous silicates, white, cream, resinous.

P Petrified Wood: Amorphous silicates. Tan, dull, opaque.

SS Siliceous Siltstone: "Mudstone" Amorphous silicates, "banded" structure, grey to maroon in color.

S Steatite: Grey. Soft soapstone or talc.

OX	Onyx:	Flat parallel bands of translucent chalcedony.
D	Dolomite:	White, grey. Poor effervescence.
L	Limestone:	Grey, crystalline, effervescence.
K	Kaolinite:	Grey clay, contains sand.
H	Hematite:	Oxide of iron ore. Earthy variety, red ochre.

Distribution of Lithic Material: Table 9 is intended to illustrate the variability of lithic material found on certain occupation sites located in (or near) the survey area. The organization of this table is rather unusual, in that the arrangement of the statistics is an attempt to graphically quantify lithic samples from various representative sites in their approximate spatial relationships.

Each site number is followed by the legal location range. The legal location township is listed to the left of each column of percentage totals. For example, the first entry in the left-hand column (24 BW 401) is located in township 1 north, range 1 west, Montana Principal Meridian. The last entry in the right-hand column is the Sheepeater Cliff Site, located in Yellowstone National Park in township 12 south, range 8 east, Montana Principal Meridian. Thus, the table spans a geographic area some seventy miles wide and 100 miles long.

Following the site number (for example, 24 BW 401), are two columns. The symbols in the left-hand column denote

various types of lithic materials; those in the right-hand column express the percentages of these materials found on each site.

The lithic samples are sorted into fifteen varieties: these, of course, are very gross categories; obviously the lithic material is amenable to much more rigorous analysis.

Some of the percentages expressed in Table 9 were calculated on the basis of a single sample, but the majority are the average of several samples collected by members of the survey party during several visits to these sites.

Three symbols used in Table 9 were not explained under the heading "Lithology." These are:

X - "Country" or ordinary rock.

GC - "Gallatin chert," a particular variety of chert found in the middle basin of the upper Gallatin Canyon.

TR - "Trace" of material. This symbol is used when fewer than three flakes of any material were found on an occupation site.

Reliability of Random Collection of Flake Samples:

Table 10 demonstrates the reliability of flake samples collected at random by various persons during the course of successive visits to site 24 GA 317. This data applies only to site 24 GA 317, however, since the same sampling techniques were used on all of the recorded sites, comparable consistency

Table 9: Lithic Material; Distribution

	<u>24 BW 401(1W)</u>	<u>24 GA 314(2E)</u>	<u>24 GA 310(6E)</u>	<u>24 PA 324(8E)</u> (North)
O	13.0	7.9	6.9	6.3
I	-	2.1	6.4	1.5
B	29.0	7.9	6.8	7.9
Q	-	5.4	-	-
PQ	.5	-	3.5	71.3
(1N)CY	-	(1N)14.5	(2S)71.4	(3S)10.4
A	2.7	1.0	1.8	-
F	-	10.0	-	-
C	52.0	-	-	-
J	-	1.2	-	-
OW	-	45.0	-	-
P	-	2.7	-	tr
SS	-	-	-	tr
GC	-	2.1	-	-
X	2.0	-	-	-
	<u>24 GA 317(4E)</u>	<u>24 GA 322(4E)</u>	<u>24 GA 315(6E)</u>	<u>24 PA 325(8E)</u>
O	4.8	16.0	1.6	60.0
I	.8	6.4	-	10.0
B	2.0	8.0	.6	5.0
Q	-	.8	.3	-
PQ	-	-	-	1.7
CY	47.2	51.6	4.5	15.0
(5S)A	1.2	(7S) 4.4	(4S) .8	(3S) 1.7
F	-	3.2	4.8	-
C	1.2	-	35.1	1.7
J	42.2	7.2	45.6	5.0
OW	-	-	-	-
P	.8	.4	.1	-
SS	-	-	-	-
GC	-	-	-	-
X	-	2.0	6.6	-
	<u>24 GA 327(4E)</u>	<u>24 GA 326(4E)</u>	<u>24 GA 324(5E)</u>	<u>(Sheepeater)(8E)</u>
O	57.1	39.1	12.3	69.5
I	28.5	36.2	1.0	3.5
B	-	1.0	3.2	-
Q	-	-	-	-
PQ	4.7	.5	3.0	1.5
CY	-	9.3	38.0	1.0
(13S)A	-	(12S) -	(9S) -	(12S) -
F	-	6.0	-	-
C	9.5	3.5	22.0	2.0
J	-	4.9	22.0	2.5
OW	-	-	-	-
P	-	.2	-	-
SS	-	-	-	-
GC	-	-	tr	20.0
X	-	1.0	-	-

might reasonably be expected.

Some of the percentages do not total 100 percent, because these samples contained fragments of "country rock" and other extraneous material.

Discussion of Lithic Material: Archaeological survey in the Gallatin area indicates that, as a general rule, the Indians selected certain types of materials to make certain types of artifacts (Cf. Jennings 1957: 99). The Indians often relied on lithic material found on or near occupation sites, but these sites were not, in most cases, occupied solely because of the availability of lithic material. Most Gallatin area sites were occupied because of the combined availability of a variety of natural resources. As Hawley (1950: 239) states:

In general, the use of a nomadic people's territory tends to be organized with reference to a number of established camping sites which are determined primarily by the distribution of natural resources. . . . In all instances the water supply is a factor of prime significance and fixes more precisely the site of settlement within the general area of available food.

In any case, choice of material was determined by the type of artifact to be made, as well as by the type of material available. Projectile points, for example, were usually made from certain materials--ease of flaking and edge-sharpness probably being criteria in their selection. Chert, obsidian, basalt, and jasper were preferred in the order listed, contrasting the use of these materials on the

Material	Surface	Test 1	Surface	Surface	Test 2	Test 4	Surface	Test 3
O	4.8	4.3	3.7	1.8	.7	3.0	7.1	-
I	.8	-	-	.6	.7	3.0	8.6	-
PQ	-	1.4	1.6	-	-	-	-	-
B	2.0	7.1	11.2	6.5	2.1	13.0	10.1	6.9
C	1.2	1.4	4.3	4.3	.7	-	1.4	4.1
A	1.2	-	3.0	.9	.7	-	5.7	-
J	42.2	40.0	35.0	36.2	29.0	26.6	10.0	44.0
CY	47.2	40.0	41.2	45.3	60.0	50.0	37.1	44.0
P	.8	2.9	-	-	-	-	-	-
OW	-	1.4	-	-	-	-	-	-
X	-	-	-	3.1	5.7	-	10.0	-
Q	-	-	-	-	-	-	10.0	-
Total Percentage	100.0	98.5	100.0	98.7	99.6	98.9	99.9	99.0
Total Specimens	250	70	160	320	140	30	70	72

TABLE 10

24 GA 317

RELIABILITY OF RANDOM COLLECTION OF
FLAKE SAMPLES
(Expressed as Percentages)

Northwestern Plains. According to Wedel (1961: 274):

Despite its easily worked character, however, obsidian was much less popular among the native Plains flintsmiths than was the more abundant and readily available quartzite.

Few of the projectile points found in the Gallatin area were made of quartzite, even though the material was readily available. Most of the projectile points found in the upper levels of the Madison drive deposit (24 GA 314) were made of obsidian and chert. Opalized wood, common in the vicinity of the drive, was infrequently used for projectile points: however, scrapers, knives, choppers, and other expedient skinning or scraping tools were made of this material. Indeed, the projectile points found in several of the bison drives located in the Gallatin area were made of materials that were not found in the vicinity of these sites.

The limited distribution in the survey area of fragments of "restricted source" materials such as opalized wood and Pinyon Quartzite suggests that the Indians did not transport large amounts of lithic raw material. The flake samples collected on the surface of the Gallatin area occupation sites indicate that as a general rule, most lithic materials were not transported more than twenty miles from their source.

According to Wendorf and Hester (1962: 168) on the plains

the size of a particular band's hunting area can be estimated to some degree [by the distribution of

lithic material] as artifacts of stone from known quarries have been found as far as 150 miles from the quarry.

(Aboriginal trade or barter of lithic material is a factor that would have influenced the distribution of lithic material in the Montana Western Region and on the Northwestern Plains.) The limited use of various materials found in the Gallatin area may be due to their rather poor flaking quality, yet obsidian and ignimbrite also seem to have a rather restricted areal distribution, although these materials were of course transported in the form of finished artifacts. For example, a beveled knife made of black ignimbrite was found on site 24 GA 315. There are no ignimbrite flakes in the lithic sample obtained at this site (Table 3); therefore, it is possible to assume with some degree of confidence that this particular specimen was not made at this site. Perhaps it was transported from the site where it was fabricated to a succession of serially occupied sites. Finally, it was lost or discarded on site 24 GA 315.

The Maxey Site (24 PA 324) provides another illustration of this phenomenon: nine hundred sixty Pinyon Quartzite flakes were found in the sub-surface strata of the site, however, the artifacts found in association with these flakes consist of the following materials:

PQ	=	4
O	=	2
B	=	1
CY, C	=	6
J	=	1
		<hr/> 14

Thus, of fourteen artifacts, only four were made of locally obtained Pinyon Quartzite. Ten artifacts were made of other materials, but very few flakes of these materials were found (Table 3). It seems evident that in some archaeological areas, the flake/artifact ratio might provide significant information, particularly if the flakes are systematically collected.

Artifacts:

Most of the artifacts collected in the Gallatin area were found on the surface of "open-air" occupation sites.

Artifact Classification: The artifacts were arranged, according to various observed characteristics or attributes, in three general classes: chipped stone, ground stone, and bone implements. The lithic artifacts were categorized, according to observed similarities of shapes, as either projectile points or implements. A projectile point undeniably constitutes an "implement," but a specific distinction is necessary in order to expedite comparisons among some of the specimens. The artifacts were then classified as to types. Perhaps it is unadvisable to postulate or name a projectile point type on the basis of the attributes of a specimen found on the surface of a serially occupied site (Cf. Forbis 1960: 106). It can be argued that a type postulated on the basis of a single specimen may not have the validity of a type represented by several hundred specimens. Rowe (1961:

327) suggests that a sample should consist of a "minimum of 100" specimens (Cf. Forbis 1960: 105).

A type is based on observed similarities, for, as Hawley (1950: 4) states, "we observe and we invent concepts to describe our observations." Types are ascertained by means of the systematic arrangement of a certain class of specimens into "observer-imposed" categories (MacWhite 1956: 11). A type incorporates "cultural validity," recognition of "behavioral reality" (Willey and Phillips 1958: 13), "qualitative and quantitative attributes" (Spaulding 1960: 437-56), and other classificatory criteria. Thus, a type is a systematic conceptual ordering of attributes shared by specimens of a discrete class of phenomena.

The principal criteria for classification of the projectile points found in the Gallatin area were the salient morphological attributes of the specimens, including diagnostic traits such as the shape of the blade; the characteristics of the stem and hafting notches (if present); the cross-section contour; and the method of modification, viz., grinding, percussion, or pressure-flaking.

The author has arranged the representative sample of projectile points found in the Gallatin area in twenty-four basic types. There are nineteen types of implements, consisting of five knives, six scrapers, and three perforator types. (The latter is a generic category that includes one awl type and two drill types.) The five ground-stone types

include one type of each of the following implements: mauls, pestles, milling stones, handstones, and "polishers."

In Chapter V, the author referred to several artifacts found by collectors. Most of these specimens are not available for typological classification. Unfortunately, this is true of the Kinsey collection, the Austin material, and the Clovis projectile point found at 24 GA 304. The latter probably represents the oldest type of projectile point known to have been found in the Gallatin area.

The projectile point types reported by Gruhn (1961: 52) and Taylor (1964: 101) are organized, and illustrated, in chronological sequence from the oldest to the most recent type (Cf. Jennings 1957: 98-100). Tentative chronological ordering of projectile point types has the advantage of providing both typological organization and a means of dating--albeit within very wide limits--some of the occupation sites upon which were found certain types of projectile points. The tacit assumption is, of course, that if comparable types of projectile points found in a certain region have been dated (by radiocarbon, for example), then the absetive date might apply to the local specimens. The contingencies qualifying this assumption seem to be too obvious to merit discussion. For one thing, certain types of projectile points could have been in local use either earlier or later than they were used in the general region. (This topic is discussed in Chapter VIII.)

Typology: The projectile points found in the Gallatin area were sorted into a representative typological sample. In making the selection, one of course tends to choose complete or intact specimens. The author admits that the sample forming the basis of the following typological classification is biased, however, it is intended to be representative. The specimens found on each site have been illustrated in this study according to site provenience, rather than in groups of types (Jennings 1957: 98-100; Hoffman 1961: 10-60).

The projectile point typology is described by formal enumeration of eight or more attributes: the site provenience of each specimen is listed under the entry "specimens." The entry "technique" heads a brief discussion of the process of fabricating the artifact from a core or "basic flake" of lithic material. Modification of the lithic material was usually accomplished by percussion or pressure flaking, or a combination of the two techniques. The term "flake" has considerable range of meaning, since it is used to describe a fragment of lithic material, as well as the process of modifying the flake. According to White (1963: 23), "chips" are removed from the basic "flake" by means of "pressure flaking."

The terms "dorsal" and "ventral" are used in the following discussion. "Dorsal, outside, outer-surface, outer-face, back, external surface, and convex surface" are regarded as more or less equivalent; as are "ventral, inner-face, internal surface, inside, and nether surface." Various

observers have used these terms to describe the opposing faces of a basic or "nuclear" flake. "Proximal, basal, and hafting-end" are synonymous; as are "distal, tip and working end."

The metrical attributes of the artifacts are expressed in centimeters. The quixotic search for "comparable specimens" was confined, in general, to perusal of line drawings and photographs published in archaeological reports describing stratified, adequately dated sites.

Chronological ordering is not the paramount consideration in the following description of the projectile point types found in the Gallatin area; however, the specimens are arranged in approximate chronological trends, beginning with the oldest type. The arrangement of the point types is merely an expedient seriation, the configuration of which should not be construed as representing an empirical areal developmental sequence.

Type: 1

Name: "Eden-Scottsbluff"

Form: Broken specimen, lacks distal portion. Straight parallel sides. Lateral offset of shoulder 0.2 mm. Straight stem, base probably straight.

Technique: Medium to large pressure flake scars. Diminutive shallow pressure flake scars on dorsal face. Sides of stem ground smooth.

Size Range:

	L	W	T
(Blade)	2.9cm	2.2cm	0.5cm
(stem)	1.4cm	1.5cm	0.5cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24 GA 325		S-116-1	22	Dark CY

Comments: The distal portion of a specimen found on site 24 GA 318 may possibly relate to Type I. This specimen is described as follows:

Form: Broken, lacks proximal end. Excurvate sides.

Technique: Oblique, shallow, parallel ribbon pressure flake scars. Width of average flake, 0.4cm. The oblique flake scars appear to span the width of the blade, however, flakes taken from one edge are joined by similar flakes taken from the opposite edge.

Size Range:

	L	W	T
	4.2cm	1.7cm	0.5cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24 GA 318		S-8-11	22	Grey SS

Comments: Flake scars weathered, virtually indistinguishable.

Comparable Specimens:

Mulloy	1958: 33, Fig. 6:1
Wormington	1957: 145, Fig. 47: right
Mulloy and Lewis	1943: 229, Fig. 28:12
Forbis and Sperry	1952: 129, Fig. 62:4
Taylor	1960: 14

Type: 2

Name: Projectile points of this type are sometimes

designated "Jimmy Allen" points because of their general similarity to projectile points found at the James Allen Site, located near Cody, Wyoming.

Form: (Basal fragments only) Edges straight, parallel. Slight to pronounced contraction at proximal end. Base is concave to straight, never convex. Cross-section of S-50-16 is plano-convex; others are lenticular.

Technique: Ribbon, medium-wide. Pressure flake scars. About half the dorsal length of S-50-16 exhibits the smooth, unaltered surface of the basic flake.

<u>Size Range</u> :		L	W	T
	<u>Max</u>	5.0cm	2.4cm	0.4cm
	<u>Min</u>	2.8cm	2.1cm	0.2cm

Estimated intact length of largest specimen: 10.0cm.

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 PA 324	S-50-16	36	Agate
	24 GA 313	S-103-1	13	Brn. Cy
	24 GA 313	S-103-2	13	W. Agate
	24 GA 316	S-48-5	18	W. Qtzite
	24 GA 314	S-45-1	16	Basalt
	24 GA 314	S-45-2	16	Basalt

Comments: Wide distribution in both canyon and valley of the survey area.

Comparable Specimens:

Gruhn	1961, Pl. 13:D,E
Mulloy	1959: 112-116
Wormington	1957: 121, Fig. 39: right
Wormington	1957: 131, Fig. 42: Lower R.
Husted	1965: 495, Fig. 1:1
Mulloy and Lewis	1943: 299, Fig. 28:7

Type: 3

Name: "Brown's Valley" projectile point (?)

Form: Specimen incomplete, lacks distal portion. Blade thin, proximal portion of the blade has straight, parallel sides. The distal third of blade is excurvate, converging to apex. There is a slight shoulder on one side of the proximal portion. Base concave, thinned. Cross-section thin, lenticular.

Technique: Transverse parallel flaking, medium to broad pressure flake scars. Base thinned by removal of three longitudinal flake scars from each face.

<u>Size Range</u> :	L	W	T
	3.4cm	3.2cm	0.4cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 318	S-8-9	22	Brown CY

Comments: Single specimen of this type found in the survey area. It is somewhat similar to Brown's Valley points.

Comparable Specimens: There are two points in the C. A. Kinsey collection that resemble this specimen. (Cf. Wormington 1957: 268, Fig. 71: right.)

Malouf 1960: 8

Type: 4

Name: "Cascade point"

Form: Shape; lanceolate, sides of blade excurvate. Specimen is bi-pointed, but is slightly truncated at proximal (?) end. Cross-section diamond-shaped, exhibits longitudinal

keel.

Technique: Percussion-flaked. Large flake scars. No grinding or smoothing of sides. Edge-view exhibits slight "S" twist.

Size Range: L W T
 5.5cm 2.0cm 1.2cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 JF 401	S-86-1	33	Brn. CY

Comments: Identified by Don Crabtree (1964) as Cascade point.

Comparable Specimens:

Butler 1962, Fig. 21:f
Butler 1962, Fig. 9:tt
Taylor 1964: 107, Fig. 13:B,C
(Cf. Daugherty 1956, Fig. 20:3)

Type: 5

Name: "Agate Basin Points":

Form: Broken specimens. All appear to have had lanceolate excurved sides; the majority have rounded base; the proximal edges are heavily ground. Cross-section varies from plano-convex to collateral; average cross-section is slightly lenticular.

Technique: Four specimens of six are percussion-flaked. Slight marginal retouch. Impact point of percussion obscured by pronounced grinding on proximal edges, however, (with the exception of S-41-10) base is not ground or smoothed. The most complete specimen (S-50-17) has been ground along one-third of its length (proximal end). The maximum width of

S-50-17 occurs slightly below the medium point of the blade.

Size Range:

		L	W	T
S-50-17	(Blade)	4.1cm	1.9cm	0.8cm
	(Stem)	1.8cm	1.5cm	-
			(Base)	

(estimated length of intact specimen:
5.0cm)

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 326	9	24	Blk. Ignimbrite
24	GA 326	8	24	Blk. Obsidian
24	PA 324	S-50-18	36	Blk. Ignimbrite
24	PA 324	S-50-17	36	Blk. Ignimbrite
24	GA 322	S-41-10	38	Basalt
24	GA 308	S-49-1	38	White Quartzite

Comments: This is a rather all-inclusive type-category. Subtypes or sub-divisions could be made on the characteristics of the individual specimens. The type is widely distributed in the survey area.

Comparable Specimens: Nearly all of the specimens are closely matched by one or more specimens illustrated in Wormington 1957: 142, Fig. 46, "Agate Basin Points." S-50-17 is similar to a specimen from the "Carbella Site." Similar points have been found by Schumate near Great Falls, Montana.

Husted	1965: 495, Fig. 1:h
Mulloy	1942: 45, Fig. 22:18
Mulloy and Lewis	1943: 299, Fig. 28:4, 5, 33
Mulloy	1943, Fig. 20, C:4-6
Strong	1935, Pl. 25, I:f
Taylor	1964: 103, Fig. 12:A

Type: 6

Name: "Hell Gap Points"

Form: Blade shape, asymmetrical, distal portion convex; proximal portion constricted to form stem with concave sides,

slightly expanding or flaring stem. Base straight. Cross-section lenticular.

Technique: Surface plane of original basic flake is evident in two of five specimens, pressure flaking, three of five specimens, basal grinding on edges of stem, one of five specimens.

<u>Size Range</u> :		L	W	T
S-46-4		4.2cm	2.3cm	0.7cm
	Blade	3.0cm	-	-
	Stem	1.2cm	1.5cm	-
S-8-15		4.5cm	2.3cm	0.8cm
	Blade	2.8cm	-	-
	Stem	1.7cm	1.3cm	-
S-46-5		4.1cm	2.3cm	0.7cm
	Blade	3.0cm	-	-
	Stem	1.1cm	2.0cm	-

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 317	S-46-4	20	Dark CY
	24 GA 317	S-46-5	20	Blk. Ignimbrite
	24 GA 317	S-46-1	20	Blk. Obsidian
	24 GA 317	S-46-2	20	Basalt
	24 GA 318	S-8-15	22	Basalt

Comments: Extreme variation in the type category. Original Hell Gap specimens also quite varied.

Comparable Specimens:

Agogino	1961: 559, Fig. 1:A-F
Mulloy	1958: 33, Fig. 6:8
Gruhn	1961, Pl. 13:G (Cf. S-8-15)
Tuohy	1963: 116, Pl. 22:Y (Cf. S-64-4)
Jennings	1957: 102, Fig. 72a
Swanson	1964, Fig. 35:i
Daugherty	1956, Fig. 18:4
Taylor	1964: 103, Fig. 12:B

Type: 7

Name: "McKean Points"

Form: Shape basically convex, triangular, excurvate sides converge slightly at proximal end. Principal identifying characteristic, deep "V-shape" base indentation. Cross-section, lenticular.

Technique: Pressure flaking, large scars frequently slant from distal edge of point across the face toward the proximal end, angle approximately thirty degrees. Fine marginal retouch on S-103-7.

<u>Size Range</u> :	L	W	T
S-103-7	5.0cm	2.1cm	0.6cm
Base	-	1.8cm	-
Depth of basal indentation:	0.7cm		
S-103-15	4.0cm	2.0cm	0.6cm
Depth of basal indentation:	0.5cm		

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 313	S-103-7	13	White C.
24	GA 313	S-103-15	13	Basalt
24	GA 316	S-48-4	18	Jasper

Comments: "Forager" complex.

Comparable Specimens:

Mulloy	1954: 44G, Fig. 4
Mulloy and Lewis	1943: 299, Fig. 28:16-19
Mulloy	1958: 33, Fig. 6:3
Malouf	1960: 9
Strong	1935, Pl. 25 I:o,n

Type: 8

Name:

Form: Basic shape, diamond. Convex to excurvate sides.

Pronounced constriction in proximal third of specimen to form contracted, nearly pointed stem. Cross-section, plano-convex.

Technique: Made on percussion flake. Original surface of basic flake unmodified. Small amount of marginal retouching along both sides of blade.

<u>Size Range</u> :		L	W	T
	S-45-5	3.3cm	1.8cm	0.7cm
	(Stem)	1.0cm	0.6cm	-

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 314	S-45-5	38	Opalized wood

Comments: The configuration of the blade may have been determined by the intractability of the opalized wood. An uncontrolled longitudinal ridge parallels the left edge of the stem.

Comparable Specimens:

Tuohy	1963: 116, Pl. 22:gg
Hoffman	1961, Form One, Type L-3
Jennings	1957: 112, Fig. 85a
Collier	1942, Pl. 3:a,b
Haury	1950: 276, Fig. 57:e,h
Rogers	1939, Pl. 14:b
Swanson	1962b: 45, Fig. 10:m

Type: 9 .

Name:

Form: Generally triangular in shape, slightly asymmetrical, widest at base. Sides slightly excurvate, base straight to convex, none concave. Cross-section lenticular.

Technique: Random pressure flaking. S-41-5 exhibits transverse parallel flake scars, very wide (0.6cm) possibly

percussion flaked, with slight marginal secondary retouching.

Size Range: (Broken specimens)

	W	T
	2.6cm	0.4cm
	2.4cm	0.4cm
	1.8cm	0.3cm
	2.6cm	0.3cm

Estimated reconstructed length, largest specimen: 5.5cm.

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 322	S-41-5	23	Basalt
	24 GA 322	S-41-6	23	Agate
	24 GA 322	S-41-7	23	Blk. Obsidian
	24 GA 312	S-7-1	13	Tan Chert

Comments: These could have served as small knives.

Comparable Specimens:

Swanson	1962b: 65, Fig. 30:8
Tuohy	1963: 119, Pl. 25:a
Mulloy	1943, Fig. 20 C:7
Forbis and Sperry	1952: 130, Fig. 63:4
Butler	1962, Fig. 10:aa

Type: 10

Name: "Hanna Point"

Form: Basic blade shape, triangular. Excurvate edges, flaring shoulder, pronounced expanding stem, constricted neck, flaring "tang," concave base, cross-section lenticular.

Technique: Pressure flaking, scars random, but directed from distal edge toward proximal end of specimen. Planar surface of basic flake discernible in two specimens.

Size Range: (Incomplete specimens)

	L	W	T
S-44-9	3.1cm	2.0cm	0.6cm
stem	1.2cm	1.3cm	-
S-44-10	2.9cm	1.7cm	0.7cm
stem	1.2cm	1.4cm	-
S-48-3	3.5cm	1.7cm	-
S-8-8	3.0cm	2.8cm	0.7cm
neck	-	1.4cm	-
stem	1.5cm	1.9cm	-

Maximum length, S-44-9 reconstructed: 3.7cm.

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24 GA 310		S-44-9	11	Red Jasper
24 GA 310		S-44-10	11	Chalcedony
24 GA 316		S-48-3	18	Blk. Ignimbrite
24 GA 318		S-8-8	22	White chert
24 JF 401		S-86-1	33	Basalt
24 PA 324		S-50-20	36	Blk. Ignimbrite

Comments: Closely resemble "Hanna" projectile points.

Comparable Specimens:

Wedel	1961: 251, Fig. 22, Hanna Point
Mulloy	1958: 33, Fig. 6:31, 32
Davis	1956: 109, Pl. VIII:C
Malouf	1950: 71
Tuohy	1963: 117, Pl. 23:J
Wheeler	1954: 8
Taylor	1964: 114, Fig. 15:A
Wettlaufer	1955: 111, Pl. 13:1
Strong	1935, Pl. 25, I:a-d

Type: 11

Name:

Form: Basic shape triangular, convex base. Very wide or broad corner-notched. S-8-7 is typologically intermediate between "stemmed" and corner-notched types. S-46-3 is corner-notched, but the notches are extremely wide. Base, convex.

Cross-section, lenticular.

Technique: Pressure flaking, flakes taken at random, directed from distal edge across blade face toward proximal end. Flakes taken from medial edges traverse laterally across face to opposite edge. Three or four flakes removed to form wide corner-notches. Most of the flake scars are quite small (0.2 wide, 0.6 long).

Size Range: (Two specimens, complete)

	L	W	T
S-46-3	4.7cm	2.4cm	0.7cm
stem	1.0cm	1.8cm	-
neck	-	1.5cm	-
notch width	-	1.7cm	-
S-8-7	5.1cm	2.2cm	0.6cm
stem	1.1cm	2.0cm	-
neck	-	1.7cm	-
notch width	-	1.2cm	-

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 317	S-46-3	20	Grey Agate
	24 GA 318	S-8-7	(NF)	Basalt

Comments: Intermediate type.

Comparable Specimens:

Mulloy 1958: 33, Fig. 6:13

Type: 12

Name: Emigrant Point

Form: Convex, excurvate blade, extremely symmetrical, edges converge very slightly at shoulder. Stem formed by removal of wide, shallow corner-notches. One notch is usually more pronounced, due to a slight lateral flare of the tang. The opposite notch is comparatively smaller, more shallow, and

the sides are curvilinear. Base of index specimen concave to depth of 0.2cm. Bases are slightly concave or atypically slightly convex. Cross-section is lenticular.

Technique: Parallel transverse medium-wide flake scars.

Flakes 0.2 to 0.3cm wide, 1.0cm long. Fine marginal retouching. Superior workmanship.

Size Range: Specimens vary from 5.0cm to 8.0cm.

	L	W	T
S-8-1	5.3cm	2.1cm	0.6cm
stem	0.9cm	1.7cm	-
neck	-	1.5cm	-
notch width-R	-	0.7cm	-
notch width-L	-	0.4cm	-

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 318	S-8-1	38	Brn. CY
	24 PA 309	S-36-1	38	Tan C
	24 GA 310	S-44-6	11	Basalt
	24 GA 310	S-44-7	11	Basalt
	24 GA 310	S-44-8	11	Blk O
	24 GA 314	(Kinsey collection, five specimens, 16)		

Comments: This point type may be one of the oldest found in the regional bison drives.

Comparable Specimens:

Arthur 1962: 21, Fig. 1:1
 Davis "Too-Close-for Comfort Site: Test Pit Four, Specimen Number One, (Photographs)
 Napton 1964: 124, Ph. 11:3,4

Type: 13

Name:

Form: Stemmed; extremely long (2cm wide, 5cm long), straight to excurvate sides, triangular blade. Short, expanding base; deep, rather narrow corner-notches. Base always concave.

Technique: Made on thin, slightly curved flake. Pressure flake scars traverse obliquely across width of dorsal face, angled from right distal edge toward proximal end. Slight serration suggested by untrimmed flake scars. Notches made by removal of two or more flakes.

Size Range:

S-13-1	L	W	T
	3.7cm	1.8cm	0.3cm
stem	0.7cm	1.2cm	-
neck	-	0.8cm	-
notch width	-	0.6cm	-
notch depth	0.4cm		

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 319	S-13-1	22	Grey SS
	24 GA 315	S-43-5	18	Chert
	24 GA 315	S-43-6	18	Chert
	24 GA 315	S-43-9	18	Jasper
	24 GA 322	S-41-3	23	Blk Obsidian
	24 GA 321	S-18-1	22	Basalt

Comments: Corner-notched projectile point with well-developed basal tang.

Comparable Specimens:

Jennings 1957: 118, Fig. 92a:left specimen
 Mulloy 1958: 33, Fig. 6:27
 Wedel 1961: 116, Fig. 10:middle row, left
 Taylor 1964: 114, Fig. 15:F

Type: 14

Name:

Form: Elongated, triangular, straight sides. Slightly expanding straight base. Corner-notch diagonal, deep, and narrow. Cross-section, plano-convex.

Technique: Made on highly curved flake. Interior pressure

flaking, surface of basic flake obliterated on dorsal face, unmodified on ventral surface. Flake scars are broad, angling from distal end across blade face to proximal end. Edges are serrated.

Size Range: (Two specimens)

	L	W	T
S-46-23	4.0cm	2.3cm	0.5cm
stem	0.9cm	1.2cm	-
neck	-	1.0cm	-
notch width	-	1.7cm	-
notch depth	0.6cm		
S-46-22	3.3cm	1.2cm	0.3cm
stem	0.8cm	1.0cm	-
neck	-	0.7cm	-
notch width	-	0.7cm	-
notch depth	0.3cm		

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 317	S-46-23	20	Blk Obsidian
24	GA 317	S-46-22	20	Chalcedony
24	GA 313	S-103-9	13	Basalt

Comments: These resemble "Pelican Lake" points (Cf. Wettlaufer 1956).

Comparable Specimens:

Jennings 1957: 115, Fig. 89a
 Gruhn 1961, Pl. 37:i-1

Type: 15

Name: Corner-notched point (Besant?)

Form: Basic triangular shape, straight to slightly excurvate sides. Base straight, diagonal corner-notches are as deep as they are wide. Cross-section is lenticular.

Technique: Symmetrical, medium-wide pressure flake scars. Wide variety in material.

<u>Size Range:</u>		L	W	T
	S-46-18	3.5cm	2.7cm	0.6cm
	stem	0.7cm	1.9cm	-
	neck	-	1.2cm	-
	notch width	-	0.5cm	-
	notch depth	0.5cm		

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 317	S-46-9	20	Basalt
24	GA 317	S-46-18	20	Grey Chert
24	GA 317	S-46-19	20	Jasper
24	GA 319	S-13-10	22	Blk Obsidian
24	GA 326	S-118-7	24	Blk Ignimbrite
24	GA 316	S-48-1	18	Chalcedony
24	GA 326	S-118-2	24	Brn Chalcedony

Comments: Highly generalized type, wide distribution in the survey area. These are similar to Besant points (Cf. Wettlaufer 1956).

Comparable Specimens:

Mulloy 1958: 33, Fig. 6:21
 Forbis 1960: 112, Fig. 16:A-C
 Taylor 1964: 114, Fig. 15

Type: 16

Name: Corner-notched point

Form: Basic triangular blade, sides excurvate, none straight. Base convex. Diagonal corner-notch as deep as width, narrow to medium width. Specimens are usually less than 4.0cm in length, widest portion at barbs. Cross-section plano-convex to lenticular.

Technique: Flaking good. Very small pressure flakes taken at random from the distal edges angle across the face of blade toward proximal end. Fine marginal retouch on sides of blade. Base slightly thinned by removal of approximately

four longitudinal flakes. Basic flake surface visible on five of nine specimens. Only one or two flakes removed to form corner-notches.

<u>Size Range:</u>		L	W	T
<u>Max.</u>		4.0cm	2.0cm	0.4cm
	base	0.7cm	1.6cm	-
	neck	-	1.5cm	-
	notch width	-	0.5cm	-
	notch depth	0.5cm		
<u>Min.</u>		2.4cm	1.8cm	0.4cm
	base	0.5cm	1.6cm	-
	neck	-	1.2cm	-
	notch width	-	0.5cm	-
	notch depth	0.4cm		

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 322	S-41-2	23	White Pinyon Q
24	GA 315	S-43-2	18	Chert
24	GA 315	S-43-3	18	Mottled Chert
24	GA 315	S-43-4	18	Grey Flint
24	GA 315	S-43-7	18	Jasper
24	GA 315	S-43-10	18	Grey Chert
24	GA 315	S-43-11	18	Chert
24	PA 324	S-50-7	36	Basalt
24	PA 324	S-50-9	36	Chalcedony

Comments: Very generalized type, widely distributed in the survey area.

Comparable Specimens:

Mulloy	1958: 33, Fig. 6:22
Gruhn	1961, Pl. 14:B,R
Griswold	1953: 19, Fig. 7:a-m
Davis and Stallcop	1965: 21, Pl. 3 (Cf. S-43-4)
Bliss	1950: 189, Fig. 58: Levels U II, L IV
Wettlaufer	1955: 107, Pl. 11:1-6
Taylor	1964: 114, Fig. 15:H
Swanson, Butler, Bonnicksen	1964, Fig. 36:e

Type: 17

Name: Corner-notched point

Form: Basic triangular shape. Sides straight, blade widest across barbs. Straight base. Most specimens smoothed or slightly ground on lateral edge of base. Pronounced laterally projecting basal spur. Corner-notches are diagonal, at least twice as deep as they are wide. Cross-section very thin, lenticular.

Technique: Basic flake evident in a few examples. Very straight thin pressure flakes have obliterated all traces of median ridge. Slight retouch along blade edges. Interior curve of notch often completed by removal of a single conchoidal flake, regardless of material. Flaking is transverse; workmanship is excellent. The base is frequently polished or ground smooth.

<u>Size Range</u> :		L	W	T
<u>Max.</u>	S-44-1	4.8cm	2.6cm	0.4cm
	stem	0.5cm	2.3cm	-
	neck	-	1.3cm	-
	notch width	-	0.4cm	-
	notch depth	0.7cm		
<u>Min.</u>	S-13-9	2.5cm	1.6cm	0.4cm
	stem	0.3cm	1.2cm	-
	neck	-	0.9cm	-
	notch width	-	0.3cm	
	notch depth	0.5cm		

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 310	S-44-1	11	Blk Chalcedony
24	GA 310	S-44-2	11	Yw Chalcedony
24	GA 310	S-44-3	11	Blk Obsidian
24	GA 310	S-44-4	11	Blk Obsidian
24	GA 326	S-118-6	24	Agate
24	GA 322	S-41-1	23	Jasper
24	GA 319	S-13-9	22	Brn Chalcedony

Comments: Most highly developed of the corner-notched types.

Smoothed base is an important diagnostic attribute of this type. Notches completed by removal of single conchoidal flakes. This technique is evident in the subsequent side-notched types.

Comparable Specimens:

Mulloy	1958: 33, Fig. 6:23
<u>Cf.</u> Mulloy	1958: 49
Gruhn	1961; Pl. 34:B
Mulloy	1943, Fig. 20, A:13-17
Frison	1965: 83, Fig. 2:a-c
Strong	1935, Pl. 24 2:E

Type: 18

Name: Side-notched point

Form: Stemmed, triangular type, usually twice as long as wide. Sides straight to slightly convex, relatively broad side-notches, tangs expand and project slightly into the notch cavity. Tangs convex along proximal edges, base frequently concave, sometimes straight, never convex. Cross-section thin, lenticular.

Technique: Made on long, thin flake. Basic flake surface is often obliterated by secondary flaking on the dorsal face of the blade, however, the basic flake is unaltered on the ventral surface. Pressure flake scars are random and very narrow. The flake scars of the medial and distal portion of the blade angle from the edges of the blade across the face toward the proximal portion. The flake scars are transverse or lateral on the proximal portion of the specimen. The base is thinned by removal of two longitudinal flakes

taken from the base edge into the face of the stem. The base of two of five specimens is slightly smoothed. Each notch is made by the removal of a single conchoidal flake.

<u>Size Range:</u>		L	W	T
<u>Max.</u>	S-118-1	5.0cm	2.0cm	0.4cm
	stem	0.8cm	1.7cm	-
	neck	-	1.3cm	-
	notch width	-	0.4cm	-
	notch depth	0.3cm		
<u>Min.</u>	S-43-8	2.8cm	1.6cm	0.3cm
	stem	0.7cm	1.5cm	-
	neck	-	1.0cm	-
	notch width	-	0.5cm	-
	notch depth	0.3cm		

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 326	S-118-1	24	Basalt
	24 GA 317	S-46-6	20	Basalt
	24 GA 313	S-103-8	13	Basalt
	24 GA 319	S-13-7	22	Blk Ignimbrite
	24 GA 315	S-43-8	18	Blk CY

Comments: This type may be one of the early side-notched point types in the survey area. S-103-8, atypical, has one side-notch and one corner-notch.

Comparable Specimens:

Mulloy	1958: 92, Fig. 29:15-18
Bentzen	1961: 13:1-s (Cf. S-118-1)
Forbis	1962: 6, Fig. 2:Nanton
Wettlaufer	1955: 91, Pl. 3:8
Butler	1962, Fig. 9:55
Taylor	1964: 123, Fig. 16:B

Type: 19

Name: Side-notched point

Form: Basic triangular shape, sides excurvate, widest at shoulder. Small side notches, base straight to slightly

concave. Specimens are diminutive.

Technique: Made on small flakes. Dorsal surface of basic flake is discernible, but very fine pressure flaking has obliterated basic flake on dorsal face (that is, the face illustrated in this study). Notch is made by removal of a single conchoidal flake. The base is very slightly thinned on two of five specimens.

<u>Size Range</u> :		L	W	T
<u>Max.</u>	S-70-2	1.9cm	1.1cm	0.3cm
	stem	0.5cm	0.9cm	
	neck	-	0.7cm	-
	notch width	-	0.3cm	-
	notch depth	0.2cm		
<u>Min.</u>	S-70-4	1.6cm	1.1cm	0.3cm
	stem	0.5cm	0.5cm	-
	neck	-	0.4cm	-
	notch width	-	0.2cm	-
	notch depth	0.2cm		

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	PA 321	S-70-2	33	Blk Obidian
24	PA 321	S-70-4	33	Brn Chalcedony
24	PA 321	S-70-7	33	Blk CY
24	GA 326	S-118-4	24	Blk Obsidian
24	GA 326	S-118-5	24	Blk Ignimbrite

Comments: These small, triangular side-notched projectile points are frequently found in the deposits of bison drives.

Comparable Specimens:

Mulloy 1958: 33, Fig. 6:35,46
 Forbis 1962: 7, Fig. 1: Pekisko
 Miller 1963, Pl. 43:6
 Taylor 1964: 123, Fig. 16:E

Type: 20

Name: "Un-notched points;" "Dismal River points"

Form: Triangular points, straight to slightly excurvate sides, slight lateral flare at proximal angle, base straight to concave. Some specimens have a basal indentation approximately 0.2cm in depth. The cross-section is usually plano-convex.

Technique: Made on a small, curved basic flake. The flake scars have obliterated the basic flake surface on the dorsal face of the blade, but the ventral surface is unmodified. The specimens vary in quality from extremely poorly made, obviously expedient flake-points, to carefully flaked specimens exhibiting superior workmanship. The pressure flake scars are narrow and quite short. There is a micro-retouch along the blade edges. The base is not smoothed.

Size Range: (Average) L W T
S-70-9 2.4cm 1.5cm 0.2cm

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 PA 321	S-70-9	33	Basalt
	24 PA 321	S-70-10	33	Basalt

Comments: It is evident that these points are coeval with side-notched types, e.g., type 19. Perhaps they served some specialized function.

Comparable Specimens:

Arthur 1962: 9, Fig. 1
 Mulloy 1958: 40, Fig. 11:13-15
 Wedel 1961: 116, Fig. 10: Top row, left
 Lewis: n.d. Bison Kills In Montana
 Miller 1963:, Pl. 43:9,12
 Forbis 1957: 129, Pl. 1:36,37
 Mulloy 1942: 47, Fig. 24:11-15
 Bliss 1950: 189, Fig. 58:U IV
 Strong 1935, Pl. 24, I:h

Type: 21

Name: Side-notched point

Form: Triangular excurvate side projectile points, straight base, notches wider than deep.

Technique: Surface of original or basic flake usually completely obliterated by pressure flaking. The tang of at least one example has a slight downward flare, so that there are paired "base-spurs" with an intervening straight base. This characteristic is somewhat reminiscent of Avonlea projectile point type (Kehoe and McCorquodale 1961: 186).

<u>Size Range</u> :		L	W	T
Less than		3.0cm	1.5cm	0.2cm
	stem	0.6cm	1.6cm	=
	neck	=	1.2cm	=
	notch width	=	0.3cm	=
	notch depth		0.2cm	

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 PA 321	S-70-5	33	Basalt
	24 PA 321	S-70-6	33	Chert
	24 GA 314	Kinsey Collection - Figure 16		

Comments: This type and type 22 are frequently found in bison drives.

Comparable Specimens:

Forbis 1960: 97, Fig. 12:m
 Forbis 1957: 129, Pl. I:1-6
 Arthur 1962: 21, Fig. 1:13, 15
 Taylor 1964: 123, Fig. 16:B

Type: 22

Name: Side-notched projectile point

Form: Triangular point shape, blade edges straight to

slightly excurvate, small side-notches, base concave.

Technique: Surfaces of original flake not evident in any of the specimens. Very fine, narrow pressure flaking, most scars less than 0.2cm wide. Base and sides are not ground or smoothed, but base is slightly thinned by removal, from each face, of two or three small flakes.

Size Range: Max. (Atypically large specimen)

	L	W	T
S-118-3	5.5cm	2.0cm	0.3cm
stem	1.8cm	2.0cm	-
neck	-	1.8cm	-
notch width	-	0.3cm	-
notch depth	0.2cm		
<u>Average</u>	3.0cm	1.6cm	0.2cm
stem	1.1cm	1.6cm	-
neck	-	0.7cm	-
notch width	-	0.2cm	-
notch depth	0.2cm		
base concavity depth	-	0.2cm	

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 322	S-41-4	23	Blk Obsidian
24	PA 321	S-70-1	33	Grey Quartzite
24	PA 321	S-70-3	23	Blk CY
24	PA 324	S-50-21	36	Blk Obsidian
24	GA 326	S-11-3	24	Blk Obsidian
24	GA 321	S-70-8	33	White Chert

Comments: This projectile point type is commonly found in bison drives.

Comparable Specimens:

Mulloy	1958: 92, Fig. 29:8
Mulloy	1958: 33, Fig. 6:48, 49, 50
Miller	1963, Pl. 43:L
Gruhn	1961, Pl. 14:i
Forbis	1960: 97, Fig. 12:A-C
Mulloy	1942: 41, Fig. 21:1-10
Forbis	1962: 7, Fig. 1: "Washita"
Forbis and Sperry	1962: 130, Fig. 63:6
Wettlaufer	1955: 87, Pl. 1:8
Taylor	1964: 123, Fig. 16:D

Type: 23

Name: Gallatin side-notched point

Form: Triangular excurvate blade. Tang edge and base form right angle. Side-notched narrow, deeper than wide. Principal distinguishing characteristic: single narrow basal notch.

Technique: Surface of basic flake, evident on dorsal surface of three specimens. The side and basal notches are made by removal of a single conchoidal-shaped flake. All of the specimens, edge-on, curve more than 0.2cm. The pressure flaking is random, but the flake scars tend to emanate from the distal edges of the specimen toward the proximal end.

Size Range: (Average of twenty specimens)

	L	W	T
	2.2cm	1.2cm	0.2cm
stem	0.6cm	1.2cm	=
neck	=	0.8cm	=
notch width	=	0.1cm	=
notch depth		0.1cm	
basal height		0.5cm	
base notch depth		0.1cm	

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 317	S-46-49	20	Blk Obsidian
24	GA 324	S-50-22	36	Blk Ignimbrite
24	GA 311	S-66 (Kinsey Collection)		Obsidian, Ignimbrite, Basalt
24	GA 314	Kinsey Collection	16	Obsidian and CY

Comments: A number of points of this type are among the projectile points in Plate I, Photo I, 24 GA 311, Hot Springs Bison drive.

Comparable Specimens:

Cf. Jennings 1957: 124, Fig. 100a
 Wedel 1961: 116, Fig. 10: Top row, R
 Mulloy 1958: 79, Fig. 25:1-6
 Gruhn 1961, Pl. 14:0
 Mulloy 1942: 41, Fig. 21:11
 Schumate 1950: 4, left
 Bliss 1950: 189, Fig. 58:V
 Arthur 1962: 21, Fig. 1:11
 Touhy 1963: 117, Pl. 23:ee, ff
 Taylor 1964: 123, Fig. 16:D

Type: 24

Name:

Form: Triangular shape, side-notches occur about one-third of the distance between the base and the point. Widest portion of the blade is across the base-tang. The base is slightly concave, the cross-section nearly flat, but perceptibly lenticular.

Technique: Diminutive flake scars have obliterated all trace of the cortex of the basic flake. Notches were made by removal of a single conchoidal flake. Workmanship superior. Edges sharpened by well-controlled pressure flake retouching. Cross-section very thin. The base is carefully finished by removal of very small flakes less than 0.1cm wide and 0.3cm long.

Size Range: (Single complete specimen)

	L	W	T
S-13-6	2.8cm	1.5cm	0.2cm
stem	1.0cm	1.5cm	-
neck	-	0.7cm	-
notch width	-	0.1cm	-
notch depth	0.2cm		
base height	0.9cm		

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 319	S-13-6	22	Blk CY

Comments: Late and Historic Periods

Comparable Specimens:

Gruhn 1961, Pl. 37:D,E
 Griswold 1953: 14, Fig. 3:d

Knife Type: 1

Name: "Beveled Knife"

Form: Triangular shape; blade excurvate, brought to sharp point; base straight to concave, poorly finished. Distinguishing characteristic, entire length of left ventral edge is steeply beveled. Cross-section is approximately plano-convex.

Technique: The basic artifact was made by percussion flaking, but the beveled edge is created by delicate pressure flaking. Both edges of the blade exhibit marginal retouching, but the base does not. The ventral face remains unmodified, with the exception of initial shaping by percussion flaking.

<u>Size Range:</u>	L	W	T
S-43-1	8.9cm	5.3cm	0.9cm
S-41-8	6.5cm	4.6cm	0.8cm
S-145-1	9.0cm	5.0cm	0.6cm

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 315	S-43-1	38	Blk Ignimbrite
	24 GA 322	S-41-8	23	Basalt
		S-145-1	(N.Fig.)	Brn Chalcedony

Comments: This implement may be a multi-purpose artifact.

It is uniface, but could have functioned either as a scraper or knife.

Comparable Specimens:

Frison 1965: 83, Fig. 3:b

Knife Type: 2

Name: "Oval Knife"

Form: Oval shaped knife, frequently brought to a very blunt distal "apex." The base is rounded. Artifacts of this type range in size from very small specimens to extremely large examples that many investigators classify as "choppers" or "cleavers." Cross-section, lenticular.

Technique: Very large percussion flake scars form a rough cutting edge. In some examples, peripheral retouching has increased the sharpness of the cutting edge. The linear edges of the specimens are poorly controlled, but most of the specimens are quite sharp.

Size Range: The largest specimen, if complete, would probably exceed 15.0cm in length. The smallest is about 5.0cm.

<u>Max.</u>	S-118-15	L 15.0cm	W 8.0cm	T 1.9cm
<u>Min.</u>	S-46-61	5.0cm	3.3cm	1.0cm
<u>Average</u>	S-46-62	7.3cm	3.5cm	1.0cm (Index Specimen)

Comments: Several dozen of these implements were found in the survey area. Many are broken on an oblique angle. The small specimens were probably hafted for use.

Comparable Specimens:

Gruhn 1961, Pl. 37:N
 Mulloy 1942: 47, Fig. 25:4-9
 Bliss 1950: 189, Fig. 58:I, right
 Mulloy 1943, Fig. 20, B:1

Knife Type: 3

Name: "Hafted Knife"

Form: Lanceolate, symmetrical knife blade. Very sharp pointed distal end, rounded or convex proximal base.

Technique: The initial modification of the basic discoidal flake is by percussion; almost all of the original flake surface is obscured by rough percussion flaking and subsequent additional pressure flake modification. The base was not retouched, but the point is carefully finished. These knives were hafted. Mulloy (1958: 96, Fig. 31: 1, 2, and 15) has illustrated several specimens hafted in wood or bone handles. Some of the Gallatin area specimens exhibit minute fractures and crushed edges incurred during use.

Size Range: (Average)

	L	W	T
	7.2cm	4.3cm	1.1cm

<u>Specimen:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 BW 401	S-42-26	38	Brn Chalcedony

Comments: These are widely distributed in the survey area, and are very common in the Montana Western Region.

Comparable Specimens:

Jennings 1957: 143, Fig. 124a
 Mulloy 1942: 77, Fig. 38:10
 Swanson 1964, Fig. 35:b
 Taylor 1964: 136, Fig. 21:B

Knife Type: 4

Name:

Form: Large, approximately ovoid basically asymmetric shape, one straight edge, one convex edge.

Technique: Large basic flake, roughly percussion flaked along convex edge, forming sharp cutting edge. Single facet of basic flake discernible.

Size Range: (One specimen, broken)

	L	W	T
S-160-1	9.0cm	4.5cm	1.3cm

Length intact--10.5cm.

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 PA 325	S-160-1	(N.Fig.)	Grey CY

Comments: Found site 24 PA 325, Test Pit I, Level Three, Depth, 22 inches.

Comparable Specimens:

Jennings	1957: 148, Fig. 130a
Mulloy	1958: 39, Fig. 10:16
Mulloy	1958: 40, Fig. 11:28
Wettlaufer	1955: 99, Pl. 7:12
Strong	1935, Pl. 25, I:k

Knife Type: 5

Name: "Double-Edge knife"

Form: Thick asymmetrical flake made with two diametrically opposed cutting edges.

Technique: Percussion flaked cutting edge brought to a point: by inverting the position of the artifact, the opposite knife edge can be used. Both cutting edges of the specimen are worn, presumably from use.

Size Range: L W T
 S-42-41 5.2cm 2.6cm 1.2cm
 Length of cutting edges: 4.0cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24 BW 401		S-42-41	38	Brn CY

Comments: Highly specialized tool.

Comparable Specimen:

Cf. Jennings 1957: 136, Fig. 117a
Cf. Swanson 1964, Fig. 35:K

Scraper Type: 1

Name: Plano-convex scraper

Form: Elongated in shape, twice as long as wide, bulb of percussion evident at proximal or hafting end. In longitudinal elevation, the distal end of the artifact exhibits a definite hinge-fracture "hook," modified by secondary flaking to form "bit" or scraping edge.

Technique: Lamellar flake struck from core by percussion, modified by pressure flaking into a uniface implement.

These scrapers were probably hafted to handles made of bone or antler. The transverse distal edge, or "bit" is sometimes worn smooth, probably as a function of prolonged use.

Size Range: L W T
 Max: 5.0cm 3.0cm 0.7cm
 Min: 4.0cm 2.7cm 0.3cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24 GA 317		S-46-28	21	Jasper

Comments: It is problematical whether the transverse edges

of these scrapers were functional. This type of scraper is often found in association with corner-notched projectile points.

Comparable Specimens:

Jennings	1957: 150, Fig. 134
Gruhn	1961, Pl. 37:u
Mulloy	1942: 41, Fig. 20:25
Frison	1965: 83, Fig. 2:t
Strong	1935, Pl. 24, I:c
Taylor	1964: 142, Fig. 24:A

Scraper Type: 2

Name: Plano-convex or "end" scraper

Form: This scraper type is frequently ovoid in shape, but varies to a "D" shape, triangular, or nearly ovoid shape.

Technique: The curved basic flake was struck by percussion from a large core. The dorsal, or convex surface of the basic flake is usually the cortical surface of the core. The proximal and distal ends of the specimen curve into the ventral surface. A pronounced hinge fracture, formed by detachment of the basic flake from the core, is transversely pressure-flaked to form a scraping edge. Typically, in longitudinal elevation, the maximum thickness of the artifact occurs in a massive frontal ridge located on the ventral surface, immediately posterior to the scraping edge. The basic flake thins along the axis of percussion converging toward the proximal end. Both longitudinal edges were flaked in the same manner as the scraping edge; possibly to expedite hafting. The proximal end, however, usually was

not flaked.

Size Range: (Extreme variation of size exhibited in these artifacts.)

	L	W	T
(Smallest specimen)	1.9cm	1.8cm	0.2cm
(Largest specimen)	6.0cm	5.5cm	1.3cm
(Average size)	3.0cm	2.5cm	1.0cm

<u>Specimens</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 326	S-118-11	24	Agate
	24 GA 317	S-46-10	21	Jasper
	24 PA 321	S-70-19	33	Brn CY
	24 GA 326	S-118-16	25	Blk Ignimbrite
	24 JF 401	S-86-2	33	Red Quartzite

Comments: Small plano-convex scrapers are frequently found in occupation sites associated with bison drives.

Comparable Specimens:

Jennings	1957:	153, Fig. 137
Miller	1963,	Pl. 43:20, 21
Swanson	1962b:	73, Fig. 34:i
Forbis	1960:	120, Fig. 19:H
Mulloy	1942:	41, Fig. 20:S-19
Wettlaufer	1955:	97, Pl. 6:5
Taylor	1964:	142, Fig. 24:B

Scraper Type: 3

Name: Plano-convex scrapers

Form: Elongated, somewhat triangular in shape. Exhibits lamellar flaking along entire periphery and a typical hinge-fracture "bit" or scraping edge; however, the massive frontal ridge characteristic in Type 2 specimens is absent. The length of Type 3 scrapers is usually two or three times greater than the width.

Technique: Made on percussion flake; bulbular end forms apex at proximal end of artifact. The apex is often brought

to a point; this feature may or may not have been functional. The convex dorsal face was thinned by flaking. The concave, smooth ventral surface was not retouched.

Size Range:

	L	W	T
Index specimen (S-46-29)	6.4cm	3.0cm	0.7cm

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
(Index) 24	GA 317	S-46-29	21	Jasper
24	GA 322	S-41-12	(N.Fig.)	Brn Chalcedony

Comments: There is probably little functional difference among Types 1, 2 and 3. The shape of these types was probably largely determined by the essentially random form of the basic percussion flake.

Comparable Specimens:

Jennings 1957: 151, Fig. 135
Taylor 1964: 141, Fig. 23:F

Scraper Type: 4

Name: Transverse or "side" scraper

Form: Extreme variation in form. In general, the specimens are made on random, elongate lamellar flakes. Individual specimens exhibit skillful, but probably highly expeditious modification along a single, lateral or transverse convex edge.

Technique: Probably any suitable flake was rapidly modified by percussion to form a convenient scraping edge.

Size Range:

	L	W	T
S-50-5	8.6cm	2.8cm	1.5cm
	6.3cm	3.2cm	0.5cm

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 PA 324	S-50-5	36	Brn CY
	24 GA 326	S-118-12	24	Blk Obsidian

Comments: Very common type of implement.

Comparable Specimens:

Jennings 1957: 162, Fig. 150a
 Jennings 1957: 165, Fig. 153:center
 Taylor 1964: 141, Fig. 23:G
 Strong 1935, Pl. 25, I:x

Scraper Type: 5

Name: "Manual" scraper

Form: Large, irregular, approximately cvoid in shape. Two steep scraping edges.

Technique: Massive tabular flake or core roughly modified by percussion flaking into large, serviceable uniface scraping tool. Cortex visible on dorsal surface. Implement was used manually, that is, it was not hafted to a handle.

Size Range:

	L	W	T
S-44-46	16.5cm	12.5cm	2.5cm

<u>Specimen:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24 GA 310		S-44-46	12	Basalt

Comments: Dorsal surface displays longitudinal ridges that have been worn smooth; probably as a result of repeated contact with the skin of the user's hands.

Comparable Specimens:

Mulloy 1958: 39, Fig. 10:8
 Swanson 1962b: 73, Fig. 34:p
 Jennings 1957: 147, Fig. 129

Scraper Type: 6

Name: "Concave scraper"

Form: Concave scraper or "spokeshave" made on an irregular, oblong flake. The basic flake curves longitudinally, and is obviously a broken percussion flake, terminating in a short step-fracture.

Technique: Both longitudinal edges have been flaked, probably by pressure, into longitudinally incurvate scraping surfaces, concave in both lateral and dorsal views.

Size Range:

	L	W	T
S-118-10	3.9cm	3.1cm	0.3cm
(Minimum width at center)			2.0cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 326	S-118-10	24	Brn Chalcedony

Comments: Resembles the so-called "crescentic implement" or "spokeshave" often mentioned in regional archaeological literature. Possible function: scraping arrowshafts.

Comparable Specimens:

Jennings	1957: 165, Fig. 153:left
Gruhn	1961, Pl. 17:K
Arthur	1962: 21, Fig. 1:9
Daugherty	1956: 248, Fig. 21
Swanson	1964: 20, Fig. 10:n
Mulloy	1958: 39, Fig. 10:21
Frison	1965: 84, Fig. 4:c, n, s
Butler	1962, Fig. 11:ee
Wettlaufer	1955: 95, Pl. 5:9
Taylor	1964: 144, Fig. 25

Perforator Type: 1

Name: Awl or punch

Form: The artifact is usually made on any initially suitable

random flake having an extremity capable of being modified into an "awl" or "punch" tool.

Technique: A random basic flake was pressure-flaked to a sharp plano-convex apex. In most cases, secondary flaking rendered the tool suitable for use either as a side scraper or perforator.

<u>Size Range:</u>	L	W	T
(Index) S-41-9	9.4cm	3.5cm	1.7cm
S-118-17	5.0cm	2.0cm	0.5cm

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 322	S-41-9	23	Brn CY
	24 GA 326	S-118-17	25	Jasper
	24 BW 401	S-42-32	38	Agate
	24 GA 317	S-46-44	21	Jasper

Comments: It is possible that this type chronologically antedates "drills." S-46-9 was not hafted for use.

Comparable Specimens:

Jennings	1957: 167, Fig. 155:left
Forbis	1957: 135, Pl. II:6
Mulloy	1942: 45, Fig. 23:10
Mulloy	1943, Fig. 20, B:5
Strong	1935, Pl. 24 I:J
Taylor	1964: 131, Fig. 18:G

Perforator Type: 2 .

Name: Drill

Form: Random, irregular basic flake exhibiting a suitable projection was modified into a long, slender drill.

Technique: Pressure flaked drill shaft, collateral in cross-section.

Size Range: (Proximal drill "shank")

	L	W	T
(Index specimen)	2.9cm	1.5cm	0.4cm
(Distal drill "bit")	2.4cm	0.7cm	0.3cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	BW 401	S-43-38	38	Brn CY

Comments: Drills rare in survey area.

Comparable Specimens:

Jennings	1957: 166, Fig. 154
Gruhn	1961, Pl. 17:A,B
Mulloy	1942: 51, Fig. 27:4
Schumate	1950: 8, Drills - Punches
Mulloy	1943, Fig. 20, B:4
Strong	1935, Pl. 24, 2:g
Taylor	1964: 131, Fig. 18:F

Perforator Type: 3

Name: Drill

Form: Drill or perforating implement made of bone, probably bison.

Technique: Small, sharp fragment of unmodified bone used to drill or perforate hide. Discarded when dull.

<u>Size Range</u> :	L	W	T
S-50-15	4.7cm	1.2cm	0.7cm

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	PA 324	S-50-15	36	Bone

Comments:

Comparable Specimens:

Jennings	1957: 196, Fig. 178
Mulloy	1958: 101, Fig. 35:3; 46, Fig. 14:13
Gruhn	1961, Pl. 20:A,G
Forbis	1957: 145, Pl. 5:4-7
Mulloy	1942: 69, Fig. 34:9-12
Wettlaufer	1955: 93, Pl. 4:1

Ground Stone Type: 1Name: Maul

Form: Smooth, ovoid cobble, initially nearly symmetrical; modified by pecked groove that describes the minimum circumference of the stone.

Technique: A groove averaging 1.5cm wide and 0.5 to 1.0cm in depth was pecked into the hard surface of the cobble.

The maul was hafted for use in a split, hide-wrapped handle made of wood.

<u>Size Range</u> :		L	W	T
	<u>Min.</u>	10.0cm	7.0cm	
	<u>Max.</u>	20.0cm	12.0cm	

<u>Specimen</u> :	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 304	(Local collection)	26	Limestone

Comments: Frequently one end is slightly larger than the other. This end is often abraded, chipped, or crushed-- damage sustained during use.

Comparable Specimens:

Mulloy	1958: 55,	Fig. 17:1
Griswold	1953: 15,	Fig. 4:f,g
Mulloy	1942: 56,	Fig. 28:1
Schumate	1950: 24	
Malouf	1960: 14	
Taylor	1964: 155,	Fig. 30:B

Ground Stone Type: 2Name: Pestle

Form: Long, cylindrical water-worn cobble; unmodified, however, larger, or distal end, is often highly abraded.

Technique: Appropriate cobble was selected from river-washed

glacial drift. Size, weight, and contour suitable for manual use were requisite attributes.

Size Range:

	L	W
	18.0cm	Prox. 4.5cm
		Dist. 6.0cm

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 304	Private ownership	26	Diorite
	24 GA 314	Kinsey Collection		Dolomite(?)

Comments: These pestles are not common in the survey area, but are frequently found in the Montana Western Region.

Comparable Specimens:

Mulloy	1958: 43, Fig. 13:1
Tuohy	1963: 123, Pl. 29:c
Malouf	1960: 14

Ground Stone Type: 3

Name: Milling implement(?)

Form: Extremely elongated cylindrical stones, round in cross-section, modified to form "roller-shaped" implement.

Technique: Peck and abraded into appropriate contour. Cortical surface sometimes visible. No decorative marks or incisions.

Size Range:

	L	W
	30.0cm	6.0cm

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 304	Private collection	26	Onyx(?)
	24 GA 309	Private collection		Travertine
	24 GA 311	Private collection,		broken specimen

Comments: Possibly functioned as milling implement.

Comparable Specimens:

Malouf 1962, Fig. 1:10
 Griswold 1953: 42, Fig. 15, 16

Ground Stone Type: 4

Name: Handstones, "manos"

Form: Elliptical cobble, one surface of which was used as a milling or grinding implement. Microscopic examination under a strong raking light revealed a series of narrow transverse striae extending at a slightly oblique angle across the ventral face of the index specimen (S-118-19). A similar specimen found on the same site is ovoid in shape. The ventral or nether face has been ground to a semi-tabular surface. There are a few minute striae extending across the ventral surface of the specimen. The hemispherical dorsal surface is unmodified (S-118-18).

Technique: Probably any suitable cobble was used as a milling or grinding implement.

Size Range:

	L	W	T
S-118-19	10.0cm	5.7cm	3.4cm
S-118-18 Diameter		10.0cm	4.6cm

<u>Specimens:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
	24 GA 326	S-118-18	25	Green Diorite
	24 GA 326	S-118-19	25	Tan Arkose

Comments: These two specimens probably constitute two separate types, however, both were surface finds on the same site. These are the only handstones found in the survey area.

Comparable Specimens:

Jennings 1957: 213, Figs. 192, 193
 Davis 1956: 111, Pl. IX:e ("Irregular muller")
 Hoffman 1961: 88, Fig. 24:1
 Gruhn 1961, Pl. 19:D
 Mulloy 1958: 55, Fig. 17:2
 Tuohy 1963: 125, Pl. 31:d
 Taylor 1964: 161, Fig. 34

Ground Stone Type: 5

Name: "Polisher"

Form: Flat, thin, approximately "D-shaped" cobble, the straight-edge is very smooth at center. The dorsoventral surface is smooth. The modified, utilized edge of the stone is concave to a depth of 2.0cm.

Technique: The curved dorsal surface of the "D-shaped" cobble is highly polished, evidently due to repeated contact with the hand of the user. A large flake has been removed from the convex ventral surface of the specimen. Whether the flake was removed accidentally or intentionally is difficult to determine.

Size Range:

L	W	T
8.5cm	6.0cm	0.7cm

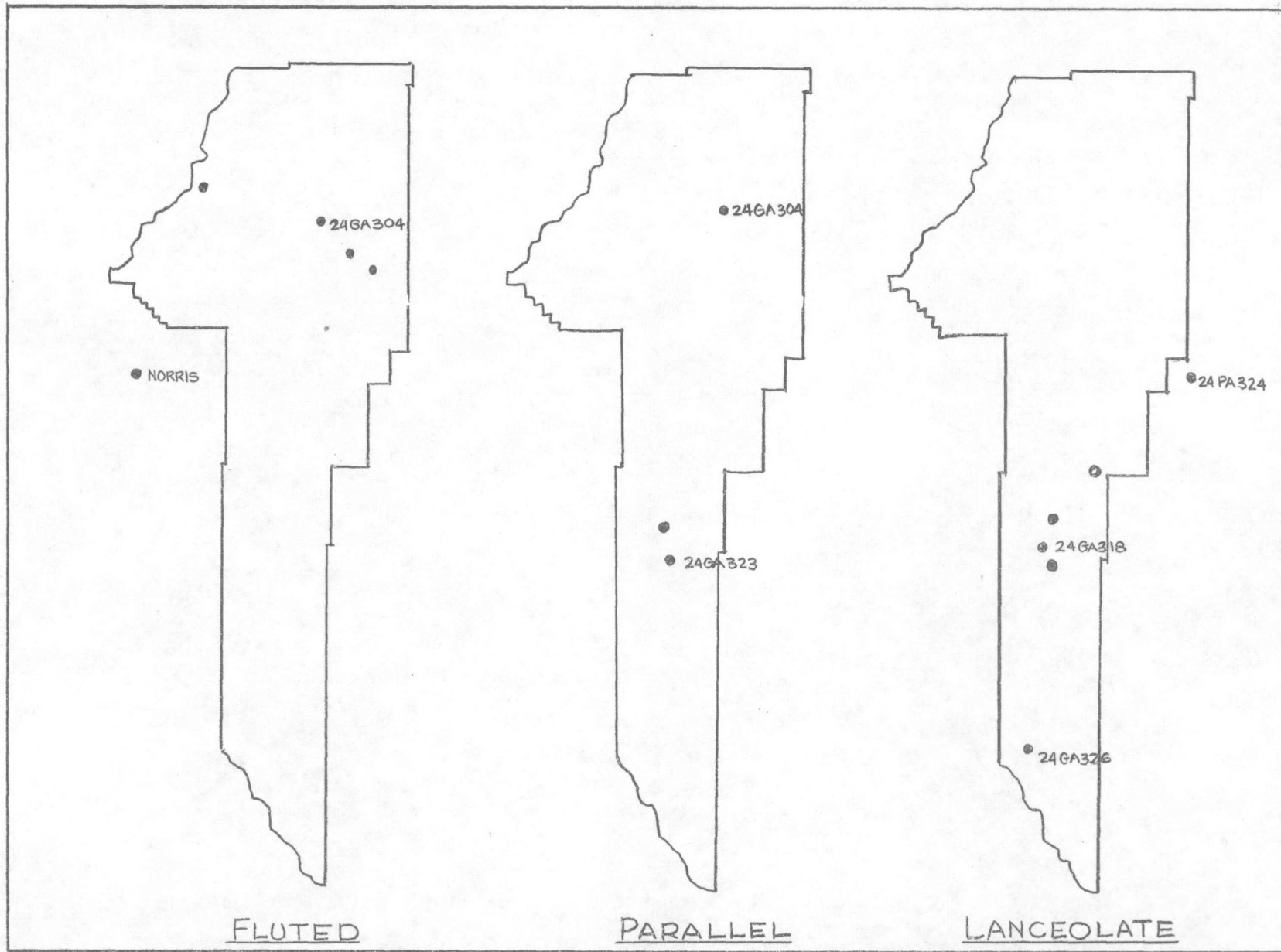
<u>Specimen:</u>	<u>Site</u>	<u>Number</u>	<u>Figure</u>	<u>Material</u>
24	GA 326	S-118-25	26	Very hard, dense black stone, unidentified

Comments: The function or purpose of this artifact is obscure. It could have been used as a "porcupine quill-flattener" (Cf. Neuman 1960: 99-102). Perhaps the artifact was discarded when the functional edge became too deeply

concave. The specimen is smaller, thinner, and generally dissimilar to "edge-ground cobbles" found in the survey area and in the Montana Western Region (Napton 1957).

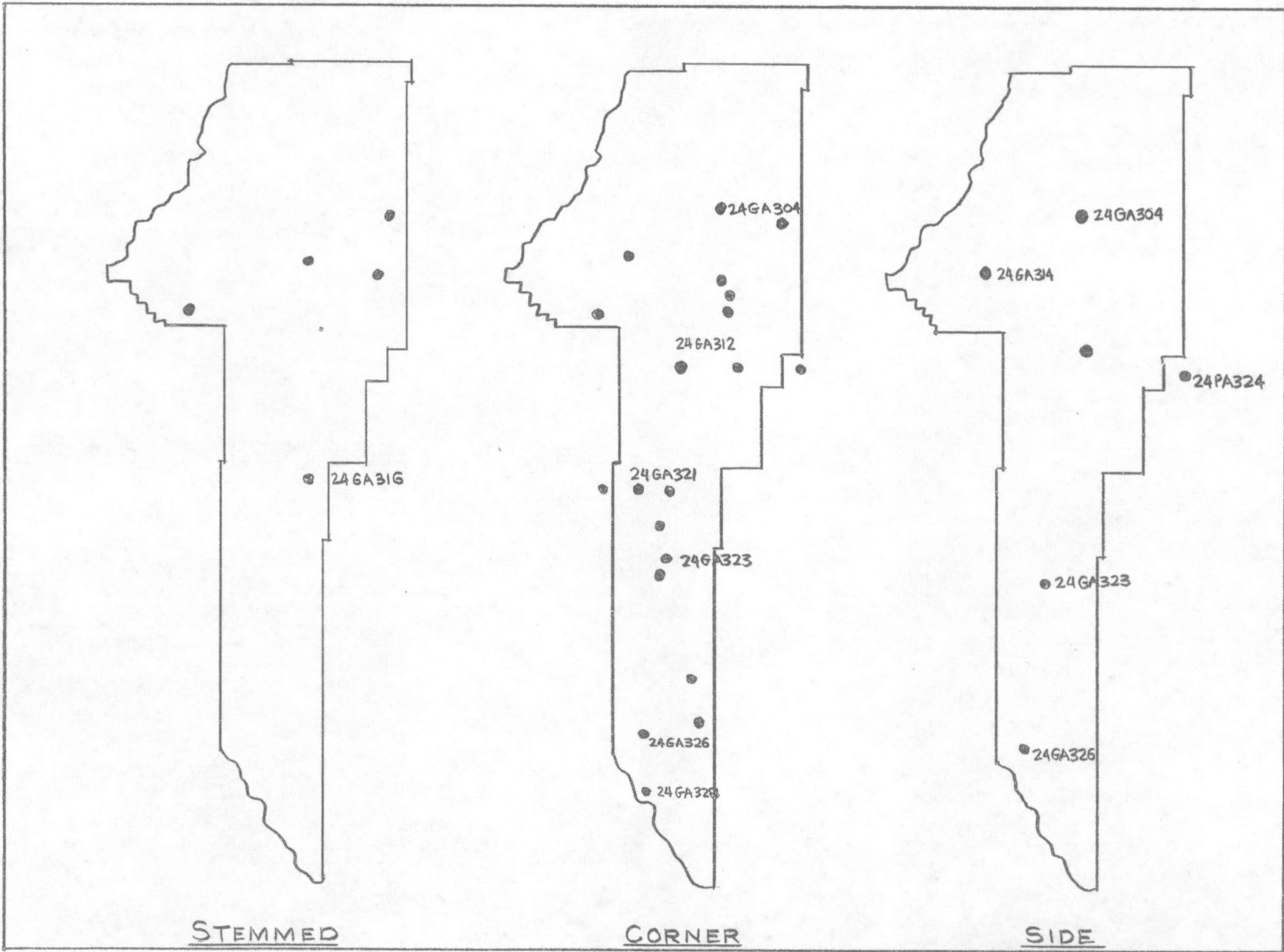
Comparable Specimens: At present, reasonable facsimiles are unknown.

- FIGURE 39 -



PROJECTILE POINT FORM DISTRIBUTION I

- FIGURE 40 -



PROJECTILE POINT FORM DISTRIBUTION II

CHAPTER VIII

THE ARCHAEOLOGY OF THE GALLATIN AREA:

GENERAL DISCUSSION

Culture: The archaeological sites found in the survey area indicate that the cultural tradition (Willey and Phillips 1958: 37) of the prehistoric inhabitants of the Gallatin area was based on hunting, supplemented by unspecialized gathering. This fundamental economic pattern seems to have persisted at least eight to ten millenia--from the time of man's arrival in the Gallatin area until the time of Caucasian contact.

Technology: The material culture found on the sites recorded in the Gallatin area was composed, without significant exception, of percussion and pressure flaked artifacts used in hunting. Cultural continuity is implicit in the material culture, however, there are local variations in economic emphasis. The absence, in the material culture, of implements used in the preparation of vegetal foods might be more apparent than real, and could be due to the fact that extensive portions of the central Gallatin Valley were not thoroughly investigated. However, the sites which were recorded did not exhibit prima facie evidence of food collection; that is, as might be indicated by discovery of

numerous metates, manos, pestles, mortars, handstones, and like implements (Cf. Mulloy 1954: 432-60). The material culture of the surveyed sites consisted almost entirely of artifacts used in hunting; therefore, one might conclude that vegetal foods were not exploited, or were an unimportant, minimal component of the prehistoric Indians' diet. Nevertheless, it is possible that a large portion of the prehistoric diet consisted of vegetal foods. The point, of course, is that if lithic implements were not used in gathering or preparing vegetal foods, there would be no way to demonstrate archaeologically that the prehistoric inhabitants of the Gallatin area were omnivorous. Refined analysis of the ecological and geological context of stratified sites might provide a more representative spectrum of prehistoric food resources in the Gallatin area.

Ideology: Several sites found in the survey area, such as 24 JF 402, a stone circle or rock alignment, might have been ritual manifestations. Some of the extensive rock alignment sites (24 MA 303) seem to have had no practical purpose: perhaps they served some ritual or ceremonial function.

Eight pictograph sites were found in the survey area. These might pertain to the Vision Quest ritual, since there is ethnographic data supporting this assumption; however, be it so, pictograph sites afford but a mere glimpse of the

ideology of the prehistoric inhabitants of the Gallatin area.

Sociology: The size, location, and distribution of the recorded sites in the Gallatin area indicate that most of the surface sites were probably occupied by nomadic hunters, organized in small aggregations such as bands, or groups (Cf. Mulloy 1958: 208). During the Early and Middle Periods in the Gallatin area, social units might have consisted only of nuclear or extended families. Steward (1938) is of the opinion that there is a functional interrelationship between hunting in a specific territory, the male's continued residence in that area, patrilocality, and local exogamy.

The bison drive sites located in the Gallatin area and the Montana Southwestern Sub-Region seem to exhibit a gradual evolution or development from a simple, spontaneous drive to a sophisticated, premeditated community project. The social implications of the bison drive complex are discussed below.

None of the archaeological sites found in the Gallatin were fortified; few were located in positions that could have been easily defended. The absence of fortified sites does not necessarily demonstrate that warfare did not occur, yet the impression gained from an appraisal of the archaeological sites found in the Gallatin area is that the inhabitants of these sites were not greatly concerned for their

safety.

Implications: The following commentary is based on the data obtained by preliminary surface survey of portions of the Gallatin area. Archaeological survey, by nature and definition, usually provides only limited, often equivocal data. The following essentially random observations are based on data which, however incomplete, constitutes the findings of the survey project.

The few "Early Period" sites that were recorded failed to contribute very much information, other than providing an indication of the presence of "early man" in the survey area. Several Clovis, Folsom, and Scottsbluff projectile points have been found; however, discrete "early man" occupation sites, such as the Folsom component of the MacHaffie site (Forbis and Sperry 1952: 127-32), have not been reported found in the Gallatin area. Early Period artifacts will be discussed elsewhere in this chapter.

The results of the preliminary archaeological survey of the Gallatin area indicate that a great many small occupation sites are located in the foothills of the Gallatin Valley, the Gallatin Canyon, and the mountains east and west of the canyon. Many of these sites probably were occupied during the "Middle Period," since corner-notched projectile points are the predominant type found on the surface of most of these small sites. The dimensions of these sites imply

that there were few occupants, or that the social aggregations were very small. There are many more "corner-notched point sites" in the Gallatin area than there are sites representing the earlier "stemmed" point tradition. The increase in the number of sites could be indicative of a population influx into the Gallatin area, or perhaps the indigenous population grew larger as their food sources increased. The point under consideration, however, is not the significance of the stylistic change (from stemmed to corner-notched projectile points), but the numerical predominance of the latter type.

It might be possible that the evident increase in population could be attributed to an increase in food resources; however, perhaps the supply remained static, but food was more easily obtained by means of a technological innovation of some sort--not necessarily the development of bison drives--but rather by a technological improvement benefitting the individual hunter, *i.e.*, the bow and arrow.

Many of the corner-notched projectile points found on the numerous small Gallatin area occupation sites could have been fabricated and used by Indians who constituted an indigenous areal population. The side-notched projectile point types found in the bison drives in the Gallatin Valley might have been concurrently used by transient hunters who were organized in large bands or tribes.

Many of the small groups of Indians who hunted in certain restricted territories made their projectile points in

traditional forms or shapes. These projectile points might have become somewhat stereotyped, and, due to spatial isolation, certain groups could have made and used projectile point types that were outdated or "antique" in terms of the regional lithic technology. Isolated groups could have continued to make and use relic projectile point types beyond the time that the types became extinct in the general region. Mulloy (1958: 457) alludes to this general concept as "cultural lag." Some of the "recent" or Late Period projectile points (e.g., side-notched points) seem to display uniform or standardized attributes, suggesting that as the prehistoric population of the region gradually increased, contact between various social organizations became more frequent and intimate. When they acquired horses (circa 1725), their respective material cultures gradually acquired a considerable degree of homogeneity.

Triangular-shaped side-notched projectile points were numerically the most abundant type found in the Gallatin area. Most of the side-notched projectile points were found in the deposits of a half-dozen bison drives. It is difficult to estimate reliably the number of side-notched points that have been found in the deposits of these sites: the total certainly exceeds 1000: Madison=100; Eukes=100; Hot Springs=117; Emigrant=500; Story=100; others=100. In any case, the exact total of side-notched points is unnecessary; an arbitrary minimum estimate of 1000 will permit postulation of a

quantitative ratio between the areal frequency of side-notched and corner-notched projectile points. In the following ratio, the projectile points are (1) side-notched types found in the Gallatin Valley bison drives, or (2) corner-notched points found on the Gallatin Canyon sites:

$$\frac{1000}{100} \quad \begin{array}{l} \text{side-notched points (bison drives)} \\ \text{corner-notched points (occupation sites)} \end{array}$$

$$\frac{1}{10} \quad \left| \quad \frac{10}{1} \quad \begin{array}{l} \text{side-notched} \\ \text{corner-notched} \end{array}$$

Thus, in the Gallatin area, side-notched points are approximately ten times more numerous than corner-notched points, however, approximately ninety percent of the side-notched points were found on less than eight percent of the total known sites.

Approximately sixty percent of the side-notched points found in the Gallatin area bison drives are made of obsidian or ignimbrite:

Hot Springs (24 GA 311)	56% of 117 specimens
Emigrant (24 PA 309)	69% of 66 specimens

These materials are not indigenous to the Gallatin area, but are abundant in adjacent portions of Idaho and Wyoming. Perhaps some of these side-notched projectile points were fabricated in Idaho or Wyoming during the spring and summer, and were used the following autumn in the Gallatin area bison drives. This premise is supported by ethnographic data (Schaffer 1962: 29; Wissler 1910: 41) and archaeological evidence (Kehoe and Kehoe 1960: 421-23). The

Shoshone could have been the ethnic group involved. This possibility is partially confirmed by the projectile point typology in the Birch Creek Valley, Idaho (Swanson 1964), and, of course, by the fact that pottery and steatite vessels said to have been used by the Shoshone have been found in occupation sites associated with bison drives. The premise is further verified by ethnographic data: for example, on Monday, August 19, 1805, Meriwether Lewis (Devoto 1953: 209) wrote

from the middle of May to the first of September these people [Lewis refers to a band of the Northern Shoshone] reside on the waters of the Columbia [in eastern Idaho] . . . during this season the Salmon furnish the principal part of their subsistence and as this fish perishes or returns about the 1st of September they are compelled . . . to resort to the Missouri [for hunting] . . . they always return as soon as they have acquired a good stock of dried meat . . . these peoples are on the eve of their departure for the Missouri.

Lewis⁰ observation indicates that during the Late Period (if not earlier) the prehistoric inhabitants of the region were "restricted wanderers" who observed general territorial limits, but were not confined to a particular area or locality. These nomadic groups were capable of exploiting a wide variety of subsistence resources. Their economy--and their material culture--could be modified to suit seasonal requirements and variations in local ecology. Accordingly, if an archaeologist found artifacts associated with quantities of salmon bones in the stratigraphy of a site located on (for example) the Snake River in Idaho, he might conclude that

the manifestation represented a "Riverine culture." If he found projectile points in the deposit of a bison drive located in Montana, he might regard the manifestation as indicative of a discrete "hunting culture;" however, during a single annual "economic cycle," the same group of people could have serially occupied both sites.

The nomadic lifeway of the prehistoric inhabitants of the Gallatin area is exemplified by their material culture. Often the projectile points and artifacts found on the surface of occupation sites were made of materials exotic to the site locality. This situation was evident in lithic samples obtained from almost all of the Gallatin area sites. The discrepancy between the material of the artifacts and that of the flake samples was obvious because of the considerable variability, from site to site, in the composition of the available lithic material (Cf. Table 9). The "flake-artifact discrepancy" can be explained in terms of the probability that many of the projectile points found on site "A" were not fabricated at that site, but rather at site "B" located some distance away. The Indians salvaged their spent arrowshafts whenever it was possible to do so. Shafts were difficult to manufacture; however, according to Meriwether Lewis (Devoto 1953: 222), projectile points were made "with a quickness . . . that is really astonishing." Lowie (1935: 85) states: "The Indian set a high value on well-shaped arrows . . . ten arrows . . . rated as equivalent to a

horse." Salvaged arrowshafts were probably taken to an occupation site, the broken projectile points were detached and discarded, and new points were hafted to the old shafts. It is obvious that this procedure might result in the deposition --on site "B"--of projectile points made of lithic materials obtained at site "A." The Indians might have lost some of the intact projectile points found on occupation sites (Cf. Jennings 1957: 279), but it is likely that most of these points were discarded while attached to broken foreshafts (Mulloy 1958: 92, Fig. 29, Nos. 23, 24, and 25).

Fragmentary projectile points are often found in the deposits of bison drives and kill sites. Competent investigators who have tested or excavated some of these sites have reported finding "incomplete fragments" of projectile points, however, few have described these specimens. Arthur (1962: 22) states that of 275 artifacts recovered from 24 PA 309 "only 100 specimens had identifiable bases which could be utilized in establishing types." His figures suggest that of 275 projectile points, roughly thirty-two percent were proximal portions. In other words, more than two-thirds of the specimens were distal or medial fragments. Bentzen (1961) reported that at the Powers-Yonkee bison drive, of "95 . . . projectile points . . . Fifty points were sufficiently complete to be identifiable." Thus, the projectile point sample was approximately equally divided between proximal and distal fragments. The large projectile points found by C. A. Kinsey

in the lowest level of the Madison Bison Drive (24 GA 314) were distal fragments.

At Wilson Butte Cave, Idaho, Gruhn found "106 chipped stone points or classifiable fragments of points" (1961: 52). Fifty-three of 106 projectile points were of known provenience; of these, sixteen were "unclassifiable" (1961: 117-26). According to Gruhn (1961: 52), "principal criteria for classification were the form of the base, the outline and proportions of the blade, and the overall size of the point." The unclassifiable fragments--presumably mostly distal or medial fragments--constitute thirty percent of the fifty-three specimens of known provenience. Of the total population of 106 specimens, twenty-five were "broken" (1961: 183-5). All of these were not distal fragments, however, it would appear that approximately twenty-three percent of the total projectile points were broken specimens. Thus, seventy-seven percent of the projectile points were identifiable proximal portions. Wilson Butte Cave is obviously an occupation site (Gruhn 1961: 47-9), and the majority of projectile point fragments are proximal portions.

In the Point of Rocks Cave, Kay and Austin found twenty-four projectile points (Cf. Figures 28, 29), all of which were proximal portions. At the Claypool Site in Colorado, Dick and Mountain (1960: 234) found twenty-three "tips," twenty "mid-blades," and sixty-two "whole or stem" fragments of projectile points. Dick and Mountain (1960: 225)

are of the opinion that the Claypool site was a "camping location and not merely an animal 'kill' site." They suggest that the predominance of basal fragments could be attributed to the fact that the Indians retrieved some of the spent spear shafts. Thus, proximal fragments of projectile points might statistically predominate in occupation sites and distal portions in kill or drive sites. This idea is by no means original to the present author; however, interesting indeed would be a comparison of the proximal and distal projectile point fragments found in bison drive deposits with specimens found in the strata of spatially associated occupation sites: matching portions of projectile points might be found in the strata of adjacent sites. Indeed, it is not beyond the realm of possibility that matching fragments of artifacts might be found on sites located some distance apart. Refined analysis of surface survey collections could perhaps validate this supposition.

Ecological Zone Variant: The sites and artifacts found in the Gallatin area can be appraised in the light of their ecological context. In the Gallatin area it is possible to estimate, within very general limits, the probable composition of the material culture of an archaeological site located in certain ecological contexts, or within certain physiographic "zones."

(Valley) The artifact inventory of the occupation

sites located in the Gallatin Valley (4000 feet elevation) includes mauls, pestles, milling stones, edge-ground cobbles, effigy pieces, numerous drills and perforators, and side-notched projectile points.

4000-5000 feet: The archaeological manifestations in this zone include tipi rings, rock alignments, medicine wheels, and pictographs. These features occur in association with large occupation sites. Knives and scrapers are numerous; drills, awls, and other perforators are infrequently found; ground-stone implements are absent. Several typologically "early" projectile points have been found at sites situated on terraces located within this zone.

(Canyon) 5000-6000 feet: The sites located within this zone are small. Corner-notched projectile points are the most common type. Knives are the most plentiful implement; scrapers are common; drills and awls are few. The occupational debris on some surface sites includes faunal remains, probably representing "final butchering" of animals killed near the sites.

6000-8000 feet: The sites located in this zone are extremely small; many are located on high ridges or on the summits of mountain passes. Corner-notched projectile points, knives, and a few scrapers constitute the lithic inventory. High-altitude pictograph sites are occasionally associated with these small, evidently temporary or seasonal

hunting camps.

8000-10,000 feet: A few isolated projectile points and implements have been found on the ridges above timber line in this zone. Many of the projectile points are typologically referable to the Early Period. On the basis of present evidence, it would seem that occupation sites per se are virtually non-existent.

The archaeological remains found in the Gallatin area can be graphically compared in their relationship to the hypothetical areal zonation (Figure 41). The comparison is a very gross generalization; however, the configuration might be applicable over a large portion of the Montana Southwestern Sub-Region. Certain elevations were suitable for occupation only during favorable seasons, since "for every 100 feet increase in elevation, there is on the average, a decrease of approximately three degrees fahrenheit." (Montana Almanac 1958.) As a general rule, the archaeological material decreases in quantity as the elevation increases. According to Kroeber (1939: 201),

mountains or highlands . . . are likely to be avoided in settlement when valleys or low lands are adjacent, especially so long as population density is low. A range may be of the utmost importance in geographic structure, yet serve culturally for little more than a hunting territory or tribal limit.

It is evident that in the Gallatin area, most of the stratified sites and the majority of the complex serially occupied sites are located in the valley. The archaeological mani-

festations in the canyon and valley indicate that local climatological and ecological variations exert considerable influence on the character of the artifact inventory found at many sites. In Wyoming, Frison (1965: 94) noted that

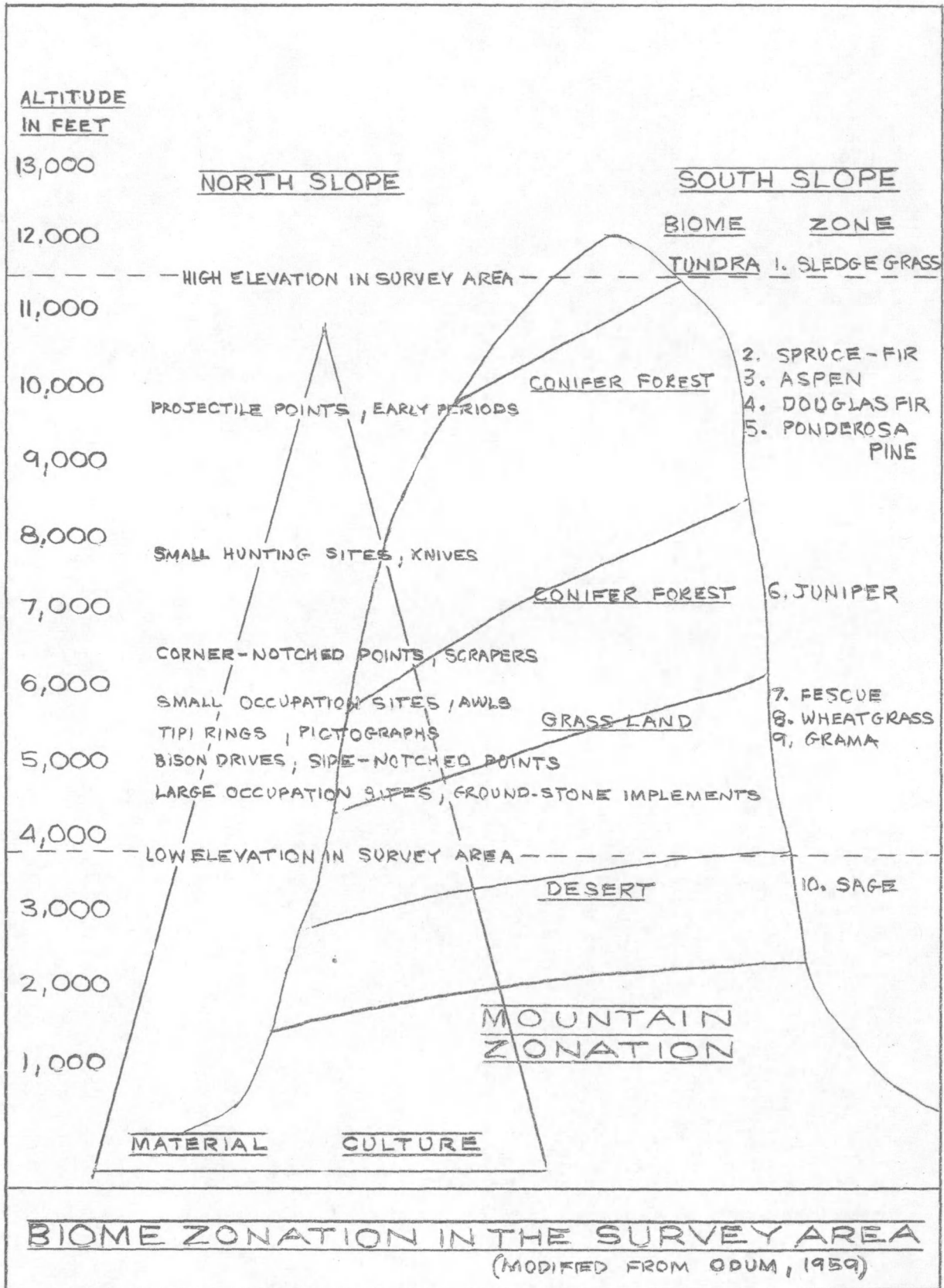
as one approaches the mountains, grinding tools decrease steadily and projectile points, knives, and scrapers become more numerous. This may represent a seasonal change in economic exploitation.

Conversely, regarding sites surveyed in the semi-desert in southwestern Idaho, Swanson (1965: 31-2) reported:

The types of sites were mapped and their distribution checked with reference to one another, to types of artifacts, and to variations in environment. The distribution showed no archaeological significance, at least in the light of present evidence.

Lifeways in the Canyon and Valley: The author has discussed the horizontal (canyon and valley) and vertical (ecological zones) relationships of the archaeological material found in the Gallatin area. Factors of cultural variation are considered in the following pages.

Valley: Some of the archaeological sites found in the Gallatin Valley are located along the meandering tributaries of the Gallatin River. Dense thickets of chokecherry brush grow along these streams. It is likely that many of the bison drives were used during the late summer or early autumn. This was the season when the Indian women picked ripe berries from the brush near the drive sites. The material culture of the occupation sites found near some of the bison drives



- FIGURE 41 -

often includes an assortment of ground-stone implements. These artifacts might have been used in the preparation of "pemmican" or similar concoctions made of berries and bison meat. Dried food constituted a small surplus that sustained the Indians during the lean winter months.

Scrapers and various types of perforators are often found in occupation sites associated with bison drives. According to Lowie (1935: 88), these implements were used in the preparation of bison-skin tipis:

The designer [of tipi covers] had as many as 20 collaborators, who she instructed in the requisite sewing together of skins and whom the tipi owners remunerated with a feast. A whole day was spent in making the sinew thread. Work on the cover was considered appropriate to the fall of the year.

It would appear that bison drives--and the mauls, pestles, drills, awls, and other types of artifacts frequently associated with these sites--could represent cyclic, seasonal exploitation of a fortuitous combination of faunal and vegetal resources. Mauls and pestles could not have been easily transported. Perhaps these implements were "cached" or temporarily abandoned from season to season when the Indians migrated to their winter camp.

There is considerable ethnographic information pertaining to the location of winter camps. According to Hawley (1950: 300):

The Plains Indians, who lived on bison, customarily organized in large hunting groups in the spring and autumn; and scattered along the small wooded creeks in the midsummer and again in the winter.

Forde (1934: 52) states:

For the winter season each band or camp group retired to a traditional tract of territory in which it had one or more favourable sites. Sheltered valleys and hollows, affording if possible some timber cover, were sought as protection against the severe gales. Group hunting played a prominent part in the winter season, although the group was smaller than in summer.

Wedel (1961: 84) discusses winter occupation as follows:

Since most of the Plains region is characterized by severe winters, it is probable that residence during that time of year was in localities selected for dependable resources of shelter, fuel, water, and game.

Teit (1930: 345) stated:

In large portion of the Plains . . . when the buffalo left there was very little game obtained; in many places, at least, not sufficient to feed a large company of people. For this reason, before the advent of the horse, portions of the great open plains were seldom visited. People who attempted to live in these places would have to follow the buffalo or starve, and they could not easily travel great distances carrying their children, old people and baggage . . . thus long ago people made their headquarters in diversified country, more or less hilly and wooded, where good shelter, firewood, poles and water were abundant, and where there was a variety of game and fish, where many kinds of root and berries were growing, and where materials for manufactures were at hand. As the places having the best conditions were in more or less hilly and partly wooded country in proximity to the Rocky Mountains, most bands made their headquarters in the country of the foothills.

The prehistoric inhabitants of the Gallatin area may not have "migrated" to a winter campsite: in many respects the Gallatin Valley was probably as favorable for winter occupation as any location in the Montana Southwestern Sub-Region. The large sites located in the central valley could be the result of semi-sedentary perennial occupation

Megafauna, as well as their human dependents, sought areas capable of providing as much food as possible. The grassland biome in the central Gallatin Valley sustained the grazing animals, and the moderate annual snowfall in the valley permitted access to winter forage. The western portion of the Gallatin Valley receives less than ten inches of precipitation per year, however, the eastern portion of the valley (near Bozeman) receives more than twice that amount. The lowland areas situated between these extremes were suitable for perennial occupation, and the sites in the lowlands seem to have been the most intensively occupied of any found in the Gallatin area.

Canyon: The material culture of most of the sites found in the Gallatin Canyon indicates that fauna constituted the major food source. The sites give the impression that the canyon was occupied during spring, summer, and autumn. Small groups or bands of hunters and their families lived along the creeks on the floor of the canyon. During the summer, individual or small groups of hunters stalked deer and elk that grazed in the high meadows in the mountains. In autumn, these animals descended to the valley in order to take advantage of more favorable grazing conditions. At present, the annual migration occurs about November first (Peek 1965: 8). Scarcity of fauna and the heavy snowfall in the mountains probably discouraged Indian

occupancy of the canyon during the winter months.

The sites found in the Gallatin Canyon could be classified in a single category--occupation sites. Stone circles or "tipi rings" have not been reported found in the Gallatin Canyon. Cultivation, destructive of these features, is minimal. If the Gallatin Canyon was occupied only during the summer months, the evident lack of stone circles might be significant, for, according to Lowie (1935: 88):

The bottom of the tipi cover was pegged to the ground; according to Bear-Crane rocks formerly weighted it down, but another informant restricts this custom to the winter season.

The majority of the lithic artifacts found on the Gallatin Canyon sites consist of three types: projectile points, knives, and scrapers. Projectile points typologically referable to the Early Period have been found at high elevations in regions adjacent to the canyon. Several early types are said to be represented among specimens found on the Beartooth plateau, an eminence flanking the plains along the Montana-Wyoming border. A very good Scottsbluff point is said to have been found at a high elevation in the mountains near Livingston, Montana. Many of the projectile points found at high elevations in the Montana Southwestern Sub-Region are typologically related to the Early Period. One might speculate that the presence of these types at high elevations could be due to the possibility that the large forms of bison extant on the Great Plains gradually withdrew

into the high mountains in response to climatic alterations: their grassland habitat might have become untenable because of extreme aridity. The surviving animals may have been hunted--perhaps into extinction--at the close of the Early Period. Several projectile points found in the Gallatin Canyon have been typologically dated to the Early Period. Side-ground points, dated circa 5000 B.C. to 3500 B.C., have been found in the canyon, as well as in the upper Paradise Valley; the Jackson Hole valley in Wyoming; the valley of the north fork of the Shoshone River, near Cody, Wyoming; and the Snake River Plain in Idaho. These localities are peripheral to the Yellowstone National Park plateau; however, only a few typologically Early Period projectile points were found on sites located within the park. The distribution of Early Period projectile points in the river canyons (such as the Gallatin) that drain the park plateau might parallel to some degree the distribution of the terminal post-Pleistocene montane glaciation.

A great variety of corner-notched projectile points are found throughout the Gallatin Canyon and Gallatin area. Their predominance in the canyon and valley sites suggests that corner-notched points were popular for a long period of time. The makers of corner-notched projectile points evidently had small social aggregations and a very generalized hunting economy, rather than an economy based predominantly on bison-hunting. Their diversified economy, representing a

local manifestation of the basic Montane cultural tradition, corresponds in temporal depth and generalized adaptive characteristics to the Desert Culture in the Great Basin. The "Forager" culture or lifeway possibly reflects regional coalescence of traits common to the Desert and Montane cultural traditions.

CHAPTER IX

PREHISTORIC POPULATION IN THE GALLATIN AREA

Introduction: The information obtained as a result of preliminary archaeological survey in the Gallatin area for the most part is not empirical data capable of supporting an exhaustive discussion of the density and distribution of the prehistoric Indian population. The available data suggests certain possibilities or implications, to be discussed in the following pages.

The data will be analyzed by means of three basic "approaches" or theoretical models: (1) "Comparison of environment." This "method" or approach will be the first to be considered, since it makes use of fundamental data. Butzer's (1964: 337-49) comprehensive discussion of the relationship of environment, subsistence, and settlement patterns is a good summary of the scope of environmental analysis.

(2) "Archaeological evidence." The physical evidence found on most archaeological sites can be studied by means of several theoretical models--at least four of which are applicable to archaeological sites and material found in the Gallatin area.

(3) "Direct ethnographic evidence." It is sometimes possible to assume that the members of certain Historic

Indian tribes who lived in a particular territory were the descendents of the prehistoric occupants of the archaeological sites found in the same region. Accordingly, if such a relationship could be demonstrated, direct ethnographic evidence could be projected into the past, and certain inferences might be made regarding intangibles such as the ideography, social structure, and demography of the prehistoric population.

These three approaches often provide at least a tentative estimate of the distribution and density of the prehistoric population in a certain area or region. ("Density" is usually expressed as the number of organisms present in a particular area; "distribution" refers to the dispersal of population elements within a finite area.) The ramifications of these "approaches" are considered in the following pages.

Comparison of Environment: An initial analytic approach can be made by comparing the environment of the Gallatin area with that of similar areas. It is possible that certain general factors function in the relationship between population and environment, e.g., according to Hawley (1950):

Environment is a generic concept under which are subsumed all external forces and factors to which an organism or aggregate of organisms is actually or potentially responsive (p. 12)

The environment of any life-form is a set of manifold external circumstances which influence, positively

or negatively, the activities of the organism (p. 17).

Andrewartha (1961: 16) has suggested that environment is divisible into four major components. The present author has revised Andrewartha's suggested categories as follows: (1) habitat, (2) food, (3) culture, (4) weather.

As Hawley (1950: 42) explains, habitat "includes a description of the place of abode of the organism, species, or association of species, solely in terms of the inorganic features present." The "inorganic features" of the environment obviously affect population density, for, as Hawley (1950: 43) stated: "The habitat [is] of major importance . . . it constitutes a set of stimuli to which organisms necessarily respond."

The Gallatin area includes a great variety of environmental zones or habitats. The archaeological material culture may reflect local ecological variations. According to Hawley (1950: 90):

Each habitat not only permits but to a certain extent necessitates a distinctive mode of life. Special problems and opportunities occasioned by the presence of certain materials, plant and animal life, climatic conditions, topography, etc., favor the development of certain habits and techniques to the exclusion of all others. In the degree to which the isolation of a unit of territory is complete the occupants acquire a set of responses peculiar to themselves.

C. Daryll Forde (1934: 464) takes a similar view:

The habitat at one and the same time circumscribes and affords scope for cultural development in relation to the pre-existing equipment and tendency of a particular society, and to any new concepts and equipment that may reach it from without.

Cognizance of the habitat is important. As J. Desmond Clark (1960: 308) observed

it is essential that the environmental and ecological setting of culture . . . be established . . . for, without this knowledge, we can hardly begin to interpret the cultural evidence. It is necessary to know the nature of faunas, of vegetation and climate, of kinds and forms of raw materials, available to man . . .

The Gallatin area constitutes a habitat, the resources of which were of paramount importance in constraining or encouraging growth of the prehistoric population. The archaeological remains found in the survey area indicate that the prehistoric population, and the regional bison population, gradually increased. The megafauna on the Northwestern Plains might have multiplied as an indirect consequence of an increase in their food supply, made possible by improved climatic conditions following the Altithermal period. Ecologist Charles Elton (1927: 68-70) postulated that 100 pounds of vegetation will support ten pounds of herbivores, which in turn support one pound of carnivores.

Evidence indicating growth of the prehistoric population in the Gallatin area is perhaps most obviously manifested in the proliferation of sites occupied during the Middle Period. The prehistoric population evidently grew larger, within circumscribed limits, as a function of the gradual augmentation of their food supply. The increase was made possible not by discovery of radical "new" methods of acquiring food (such as incipient horticulture), but

rather by development of more sophisticated mechanisms for exploiting existing resources.

The bow and arrow and large types of corner-notched projectile points evidently came into use during the latter portion of the Middle Period, and the prehistoric population grew larger, perhaps in response to the increased amount of food made available by means of this efficient mechanism. As DeLaet (1957: 114) states "for every period of rapid economic progress there is a corresponding noticeable increase in population."

Corner-notched Emigrant and Besant projectile points are found in the lowest levels of many Montana bison drive sites. It seems evident, however, that the drive or "stampede" hunting technique was in use long before Bison bison appeared on the Northwestern Plains. Drives became of major importance when large herds of bison became available. The drive technique enabled the Indians to "harvest" bison en masse, but they could preserve only part of the dried meat. Nevertheless, this small surplus was instrumental in helping the Indians to survive the lean winter months. The bison drive had the potential to provide large amounts of food--that is, if the Indians could have devised more efficient means of preserving the meat. The accumulation of surplus is a major factor in the development of culture, for, as Baumhoff (1963: 135) remarks, "subsistence efficiency has important effects on population size, density,

and aggregation."

The great bison herds certainly represented a vast potential food source. According to estimates made by Ernest Seton (Roe 1951: 493) "it will appear very safe to put the [continental] primitive buffalo population at from 50,000,000 to 60,000,000." The drive technique enabled the Indians to make great assessments upon this supply. Braidwood (1964: 291) is of the opinion that "The classic 'salmon-reapers' on the Northwest Coast of British Columbia represent the ultimate in intensified food collection." The communal bison drive probably represents the ultimate in intensive, specialized food collection by nomadic hunters.

Lowie (1935: 73) mentions that a Crow chief showed Zenas Leonard "a site at which a single recent drive had destroyed seven hundred buffalo." The presence of millions of bison--and the development of a hunting technique capable of yielding vast harvests--might have encouraged growth of a large human population. Indeed, Meriwether Lewis (Devoto 1953: 207) observed that the Shoshone had "many more children among them than I expected to have seen among a people who procure subsistence with such difficulty." (One wonders, of course, about the average life expectancy of these children.)

Perhaps the problem cannot be resolved in terms of "potential" food resources: other factors might tend to minimize or nullify the significance of potential food sources. Andrewartha (1961: 135) states that

the usual condition of most herbivorous animals and that of many carnivorous ones also [is that] some component of environment other than food presses on them so heavily that they are quite unlikely to become numerous enough to press on their stocks of food.

The average amount of food obtainable during the most difficult season may have been a crucial factor in constraining or stabilizing the growth of the prehistoric population. According to Hawley (1950: 151):

The population-carrying capacity of land is only partially determined by resources, climate, and other physical conditions. It is also effected by the manner in which the population is organized to use the resources. Thus populations living in terms of a hunting and fishing economy can not on the average be . . . numerous.

Haury (1956: 4) makes much the same point:

Mobility, demanded by a hunting economy, suggests small loosely knit family, or at most, band units . . . The archaeological record shows that . . . stationary existence, related to an improved food supply was characterized by larger and more population groups than was the case earlier.

Sears (1956: 48) remarks:

First, the earliest and simplest settlements, the camps, reflect in their small size, impermanence, and lack of organization into complex patterns the hunting-gathering economic basis otherwise demonstrated in the thin, scattered midden deposits. The type of site then affords direct evidence for a type of social system somewhere near the ultimate in simplicity.

Turning again to Hawley (1950: 198):

The Blackfoot tribes, having a total population of approximately ten thousand at one time in their history, were each composed of a number of more or less self contained bands each of which included several families and possessed a territory of its own. Throughout most of the year the band was the unit of life, but in the summer months the bands

came together in tribal gatherings for mass buffalo drives which required a larger population and higher degree of organization than was possible in a single band.

According to Claude Schaffer (1962: 29), "the bison drive was a communal enterprise carried on by members of a band." However, the point Hawley wished to illustrate is well taken: efficient social organization usually increases efficiency in food-gathering (as well as in food-producing).

The bison drive, as operated by pedestrian Communal Hunters, probably became increasingly productive as the bison herds grew larger, and, in a large measure, because of the gradual sophistication of the drive technique. At first the necessary managerial and ritual positions might have functioned only during the actual execution of the drive. Eventually, rituals and positions of authority became institutionalized. It might be that development of the communal drive virtually required concomitant development of an efficient social organization. The drive lines at 24 PA 308, for example, are several thousand yards long. While these might not have been built in a single effort, they certainly manifest communal planning and cooperation. Perhaps the success of a bison drive--in other words, the difference between feast or famine--depended upon efficient planning, organization, and cooperation (as well as upon observance of appropriate rituals).

In the Gallatin area there are several bison drives

that could have been efficiently managed by a small group of people (Cf. Malouf and Conner 1962: 48). Very few people indeed could have operated the Madison Bison Drive (24 GA 314) --and this site may have been one of the oldest drives in the Gallatin area.

The bison drive complex probably began with spontaneous or fortuitous drives, developed into premeditated, organized drives (e.g., the Madison Drive), and culminated in intricate communal drives such as the Emigrant drive and Hot Springs bison fall. (The latter is probably an example of the most recent, highly evolved manifestation of the drive complex.) Sophistication of the bison drive probably represents much more than a mere technological advancement: communal drives were an important sociological development. As the social aggregations increased in size, their organization probably became more complex, for, as Hawley (1950: 197) states:

Each increment in size is accompanied by an advance in the complexity of organization. Among the Paiute . . . who live in groups of twenty to thirty persons, organization is cast almost exclusively in terms of age and sex differences . . . In larger groups . . . of fifty to one hundred persons, greater differentiation appears in the form of a chieftain and perhaps also a shaman or priest. When the local group numbers as many as two hundred persons . . . specialized . . . bow-makers . . . and potters appear.

Steward, in Basin-Plateau Aboriginal Sociopolitical Groups, states that because the Indians of the Great Basin experienced great difficulty in gathering food, they were

unable to form large social aggregations; accordingly, most of the occupation sites found in the Great Basin are small. Steward observed that the Shoshone Indians had a nominal routine, but their movements through their territories were often quite erratic: food was obtained fortuitously, and at irregular intervals.

Therefore, the density and distribution of population aggregations dependent on an economy based on hunting and gathering is limited or constrained by certain conditions imposed by environment. The dynamic interaction of society, culture, and environment is so intimately linked on the fundamental level of hunting and gathering traditions that cause and effect are virtually indiscernible; for example, Deevey (1956: 112) states:

Most authorities would guess that the size of the hunting-gathering population was related to the size of the catchable food supply. Certain rough calculations show, however, that food supply can not have been the whole story, for the population did not approach the numbers that the wilderness might have supported. If food did not limit their numbers, what did? The answer, probably, is "social forces" --vague as that may sound.

Braidwood and Reed (1957: 19-31) considered the Star Carr site (located in England) in terms of the ramifications of environment, habitat, food, and weather:

At 420 pounds of dressed meat per adult red deer (Clark 1954: 15) which is probably an under estimate; 25 people (if 15 of them were children) could theoretically have survived on 50 deer a year (daily requirement of 25 people = 60.5 pounds lean meat, on the basis of a need of 11,400 calories per day per family; (Clark 1954: 16) . . . the main point here

is that the population of a primary hunting and collecting culture is not limited by the potential amount of food, but by man's ability to get it during the leanest season . . . that no hunting and gathering culture ever approached [the] . . . population optimum . . . is an indication of the human technological level of the hunting-collecting level.

Some of these observations are applicable to the Gallatin area. The average weight of a bison, according to estimates made by Wedel (1961: 42), is 1,700 pounds. Thevenin (1963: 52) estimates that an average male bison weighs 1,750 pounds; a female 1,300 to 1,500 pounds. The carcass of a 1,700 pound bison might provide at least 600 pounds of dressed meat. If 60.5 pounds of meat was enough to sustain twenty-five people for one day, they could have survived for ten days on the dressed meat of a single bison. Accordingly, if 700 bison were killed in a single drive, the dressed meat would total 420,000 pounds; enough (if it could have been preserved) to feed 1,000 people for one year. Obviously, their techniques of food preservation were inadequate. According to Hawley (1950: 154):

Insulation from frequent intergroup meetings leaves the population with a rudimentary technology. Producing techniques are usually too crude to yield much in the way of a surplus product. Even if there is a surplus . . . the methods of storage . . . are no more efficient than its other methods . . .

Baumhoff (1963: 161) states that the

lean time of the year for most aboriginal Californians was the early spring . . . It was then that the threat of starvation was most serious. Thus the quantity of stored food that could be carried over the winter would have been a crucial factor in determining population size.

It would appear that hunting and gathering societies in general are limited to a certain size. Braidwood and Reed (Heizer 1959: 176) concluded:

An overall examination of the evidence leads to the conclusion that a general figure of five persons per 100 sq. km. (=13 per 100 sq. mi.) is probably an overestimate of the population density of a primitive hunting-collecting people who must depend on a forest environment for survival throughout the winter.

The prehistoric population of the Gallatin area was limited not so much by "social forces" as Deevey (1956: 105-112) states; or by "technological limitations" as Hawley (1950: 198) indicates; or even by "culture history" as Forde (1934: 466) postulates; but perhaps, as Braidwood has suggested, by the amount of food that could be obtained during the most difficult hunting season. Snow falls in the Gallatin area during at least six months of the year. It is possible to conclude that the rigors of the lengthy winter (and the privations involved in cyclical nomadicism) were major factors in the dynamic system of "checks and balances" which constrained the growth of the prehistoric population in the Gallatin area.

Archaeological evidence: Estimates of population density and distribution have been calculated by means of several theoretical models based on data obtained through archaeological research. Among the more obvious of the analytic approaches are: (1) estimates based on the quantity of subsistence remains found in the site middens (Clark 1954;

Ascher 1959: 168-78); (2) tabulation of the total artifacts, flakes, and other specimens collected at the site (Cf. Oakley in Heizer 1959); (3) measurements of the physical dimensions of the sites, interpolated to provide an estimate of the number of occupants (MacNeish 1956: 146) or an indication of the order of magnitude of fluctuations in population (Hack 1942: 78-80); (4) computations based on the quantity of skeletal material (Howells 1960: 158-80); and (5) estimates of the number of dwelling places found on each site (Heizer 1960: 93-142).

The first of these approaches, based on an assessment of food remains, enabled Clark (1954: 15-6) to posit:

Possibly four, probably not more than five, family groups lived at Star Carr at any one time; considering the known high infant mortality and short life expectancy of primitive peoples, each family would usually have consisted of two parents and three children, with a minimum group of elders. The total group then was probably not in excess of 25, of whom some five were adult men who could hunt large game.

This approach is not very useful in the Gallatin area because of the paucity of faunal and vegetal debris in the middens of most of the occupation sites.

Approach number two is based on calculation of a "density-value" obtained by determining the spatial dimensions of a given site, and tabulating representative samples of the artifacts and flakes found on the site. The density value obtained is compared with archaeological sites known to have been occupied by a certain number of persons. The

potential of this approach is qualified by various conditions --for example, Mr. Don Crabtree generously provided the author with samples of flakes that he produced in the process of making a single artifact. In this particular instance, percussion-flaking of but one artifact from a small core produced 126 flakes of the size usually collected by members of the survey party--that is, flakes larger than one centimeter in length and width:

Table 11: Lithic Material; Modification

<u>Core</u> (Ignimbrite)	<u>Flakes</u>
Length: 15.0cm	8 cm to 3 cm 21
Width: 5.0cm	3 cm to 1.5cm 30
	1.5cm to 1.0cm 75
<u>Artifact</u> (Knife)	(126)
Length: 7.6cm	Less than 1.0cm 90
Width: 3.2cm	316
Thickness: 0.8cm	

The total lithic inventory of many of the Gallatin area surface occupation sites could have been produced by a single individual as he fashioned a single artifact! Therefore, population estimates based on the density or quantity of archaeological material found on the surface of Gallatin area occupation sites might be invalid, due to the fact that most of these sites were serially occupied over a very long span of time. Howells (1960: 159-60) states the problem succinctly:

A constant and major problem in archaeology is to know, from all the evidence, how many people were

present at one time, not simply how many contributed to all the rubbish.

Many archaeological sites occupied by semi-sedentary people provide empirical data applicable to population analysis, e.g., Vogt (1956: 174) states that settlement patterns can be calculated by:

(1) the nature of the individual domestic house type or types; (2) the spatial arrangement of these . . . within the community unit; (3) the relationship of domestic house types to other special architectural features, such as temples, palaces, and so on; (4) the over-all village plan; (5) the spatial relationships of the villages . . . to one another over as large an area as is feasible.

Vogt regards the individual domestic house structure as the key to such studies:

In a general way, however, one can state that the interpretation of the relationships of prehistoric settlement patterns to ecology and to socio-political and ceremonial organization proceeds on the basis of two kinds of inference: (1) from living peoples of an area who are presumed to be cultural descendents and hence provide living models of what went before and (2) from universal properties of culture that are applied to a particular case.

In general, the confidence with which an archaeologist can proceed in his inferential interpretations depends upon the amount and nature of archaeological data that remain to be studied and upon the closeness in time and in basic patterns that a specific historic or living culture bears to the prehistoric remains.

The population of a site may be estimated by counting the number of family dwelling units (Cf. Hack 1942: 78-80). The family was probably the basic unit in the Gallatin area. An average family might have consisted of five or six persons. The population of certain occupation sites in the Gallatin

area could be estimated if each family occupied a single archaeologically discernible dwelling (Cf. Butzer 1964: 434). Since many sites were serially occupied, all of the identifiable dwelling units might not have been occupied at the same time.

The prehistoric population of some of the archaeological sites located in California has been estimated by means of the application of a formula based on ethnographic data; *i.e.*, the number of villages located in a certain area, plans or maps of these villages, and the location and number of dwelling units found within the villages. According to Heizer (1956: 32):

The data required for the development of the formula (log population = constant x log area) were secured from ethnographic accounts of central and northern California native groups containing plans of villages, number of houses, and population.

Application of a similar statistical formula to the data provided by survey surface of the Gallatin area is difficult, since the population density observed by the first Caucasian explorers probably was not representative of the prehistoric population in the area. Moreover, the Indians were nomads, and very little is known of the size or arrangement of their temporary villages. They lived in brush structures, pole lodges, or bison-skin tipis. The latter could be quite commodious. Various ethnographers who observed some of the Plains Indian tribes estimated that the number of persons living in a single tipi varied from one individual

to more than forty persons (Roe 1961: 874-76), however, the average seems to have been approximately five or six persons per tipi. The Late Period inhabitants of the Gallatin area probably lived in skin tipis, or, as during the preceding Middle Period, in lodges made of poles or brush. Neither type of dwelling leaves much indication of its location-- that is, unless the ubiquitous stone circles are "tipi rings."

The subsurface remains of a prehistoric dwelling were discovered in Empty Gulch, near Pictograph Cave (Mulloy 1958: 77-81). This site exhibits several features usually found in dwelling sites, *i.e.*, post holes (or "postmoulds"), a central firehearth, a discernible entrance, and a definite floor level. Also, various implements were found in situ on the floor level. One might speculate that if stone circles are indeed tipi rings that mark the site of dwellings, the population of tipi-ring sites could be estimated.

It would appear, on the basis of present evidence, that northern Montana and the Canadian provinces constitute the geographical center of the stone circle complex. Some archaeologists believe that these features indeed represent tipi rings. Nevertheless, investigation of stone circle sites located on the periphery of the Northwestern Plains has convinced many archaeologists--notably William Mulloy--that most of the stone circles are not tipi rings. Mulloy (1958: 212) stated: "The vast bulk of the stone circle complex has nothing whatever to do with tipis or any other

kind of habitation site." He has since modified this conclusion (Personal communication, 1965).

It seems that some of the confusion regarding the possible function of stone circles stems from the fact that some investigators (i.e., Mulloy and the author) have examined sites that evidently lie on the periphery of the geographical center of the stone circle complex. Thus, many of the stone-circle sites in the Montana Southwestern Sub-Region, Wyoming, Idaho, and Nevada might be atypical, or, as Wedel suggests, these sites might be functionally or temporally unlike those found in northern Montana and the adjacent Canadian provinces.

In order to validate the widely-held opinion that stone circles are tipi rings, it will be necessary to demonstrate that at least some of these manifestations exhibit unequivocal, prima facie evidence of domestic occupation. Malouf (1961b: 388) believes that many stone circles are indeed "domestic." His opinion is shared by Kehoe (1958: 871; 1960: 459-60) who states "only that those [rings] . . . from the Blackfeet Reservation vicinity were used as lodge-cover weights, or 'tipi rings.'" According to Wedel (1961: 264),

the rock circles, so freely designated as tipi rings wherever they occur, include structures or alignments that served different purposes and perhaps at widely differing periods of time despite their general similarity.

Rock alignments resembling the stone circles found in

Montana have been reported found in Nevada (Tuohy 1963: 132, 133, Figs. 1 and 2). In Wildrose Canyon, California, Wallace and Taylor (1955: 359) found "house circles" on several "camp-sites:"

The remains of dwellings were encountered at 17 sites, mostly consisting of "house circles," small cleared spaces of earth banked around with roughly piled boulders. The clearings were made either by picking out each individual stone or by raking the larger stones outward to form the enclosing rim, thus leaving a sandy or gravelly surface. The floors were flat and in a few cases depressed. The circles normally had an entryway on one side; these were not consistently oriented. In diameter the circles ranged from 6 to 15 feet, averaging between 8 and 9 feet . . . fireplaces containing charcoal and ash were observed in or near the center of 10 circles.

In any case, in the light of present evidence, remains of domestic dwelling units have not been discovered in the survey area; therefore, estimates of the prehistoric population density cannot be based on tabulation of dwelling units.

It is possible to form a tentative estimate of the distribution of sites found in the survey area: there is at least one site per five square miles in the Gallatin Valley, and an average of one site per five linear miles in the narrow confines of the Gallatin Canyon. A striking contrast is provided by archaeological survey in Mesa Verde National Park, Colorado. On Chapin Mesa "in an area of approximately four square miles, 472 sites have been surveyed" (Lancaster et.al.; 1950: 2). In the Birch Creek Valley, Idaho, Swanson (Personal communication 1965) found 135 sites in an area of approximately thirty-five square miles. In the Canyon Ferry

Region, located some forty miles northwest of the Gallatin area, Malouf found fifty-nine sites (1950: 6) in an area of 33,000 acres (1950: 8)--in other words, approximately sixty sites in fifty square miles.

The physical or spatial dimensions of the survey area sites seem to indicate an increase through time in both the quantity and size of the sites:

Table 12: Archaeological Sites; Population Density

Period	Gallatin area site-size.(1) Average in square ft. ↓ Maximum Population		Artifact-flake ratio per control sample(2)	Number of sites, each culture period(3)	Estimated culture period, 100 sites
Historic	143	150	2	3	7
Late	50,000	500	12	5	16
(late)	30,000	300	3	12	48
Middle (early)	11,000	80	2	-	25
Early	2,000	20	1	4	4
Total				24(45)	100
(1) Estimating 400 square feet per person. (2) Five square feet of most heavily concentrated material. (3) Based on a sample of 24 of 45 sites.					

The Historic Period site-area estimate of 143 square feet is of course based on the total area of but three sites (two caves and one pole lodge) known to have been occupied

sometime after 1800. This estimate is much too low; obviously many occupation and bison drive sites were used during the years between 1800 and 1880. The site-area total and estimated population of the Late Period should be projected into the Historic Period (Figure 42).

The twelve sites attributed to the Middle Period might have been occupied concurrently by 6.7 persons ($6.7 \times 12 = 80.4$); on the other hand, perhaps each of the twelve sites were occupied at different times by a single social aggregation consisting of 80.4 persons. A likely possibility is that the twelve sites were serially occupied by several groups of intermediate size. Obviously, at present, neither the size or density of occupation sites provides a particularly accurate impression of the distribution of prehistoric population in the Gallatin area.

Direct Ethnographic Approach: The applicability of the direct ethnographic approach depends upon the availability and accuracy of descriptive data pertaining to the archaeological area; and, of course, upon the validity of the assumption that the members of a tribe existing in a certain area at the time of Caucasian contact were descendents of the Indians who occupied the archaeological sites found in the same area. The accuracy of any observations that might be made on the basis of such an assumption depends upon the proposition that the archaeological "past" and

ethnographic "present" form a continuum. The problem, in reference to the Gallatin area, is compounded by the apparent scarcity of ethnographic data pertaining to this area.

The relevance of ethnographic data to archaeological manifestations is subject to the following qualifications: (1) that the area under investigation has been more or less continuously occupied since man first entered the region; (2) that the prehistoric population was sustained by an economy that remained essentially unchanged over a long time-span; (3) that although the aboriginal material culture changed rapidly upon exposure to Caucasian culture, their sociology and ideology altered very slowly; and (4) that the postulated cultural continuum in the Gallatin area is reflected in the lifeway of the Indians residing in the region at the time of Caucasian contact.

Ethnographic knowledge of the aboriginal inhabitants of the Gallatin area extends less than 150 years into the past, however, this is a sufficient amount of time to provide an overlap of the ethnographic present and archaeological past. Unfortunately, it is difficult to correlate prehistoric sites and artifact types with specific "historic" ethnic groups. Sometimes it is profitable to investigate the possibility of such relationships (Eggan 1952: 39-40; Swanson 1964: 114; Wedel 1961: 289).

Several Caucasian ethnographers made estimates of the population of various historic tribes. It might be possible

to average these estimates and predict the density of the prehistoric population. The success of such an inquiry in the Gallatin area--indeed, in Montana--is doubtful because of the fact that a great many Indians--or entire Indian tribes--were driven from the mid-west into the Northern Plains by the inexorable Caucasian westward expansion. Many of these "displaced persons" entered Montana at least a century before the arrival of the first Caucasian explorers.

The first Caucasians known to have visited the Gallatin area were members of the Lewis and Clark Expedition. Clark (Thwaites 1905) estimated that one of the tribes found in the Montana Southwestern Sub-Region consisted of "900 souls." Lewis (Devoto 1953: 207) made several estimates of the aboriginal population, circa 1805: "The Shoshonees may be estimated at about 100 warriors, and about three times that number of women and children." According to Lewis (Hanna 1961: 841):

The Shoshonee nation resides in spring and summer on the west fork of Lewis's river, a branch of the Columbia, and in the winter and fall on the Missouri. 60 lodges and 300 souls.

Clark (Devoto 1953: 233) estimated that among the Flathead-- there were "33 lodges . . . about . . . 80 men, 400 total." (Approximately twelve persons per tipi.) Lewis (Hanna 1961: 841) states:

Ootlashoot tribe of Tushshepah nation reside in spring and summer in the Rocky Mountains on Clark's river, and in winter and fall on the Missouri and its water. 33 lodges 400 souls.

The "permanent" or indigenous population of the Montana Southwestern Sub-Region probably did not exceed 300 - 400 persons, if the estimates made by Lewis and Clark are valid. The Montana Southwestern Sub-Region is some 15,000 square miles in extent; therefore, according to the estimates made by Lewis and Clark, the aboriginal population density was approximately one person per forty-two square miles. This estimate is probably much too low.

Julian Steward (1938: 46) calculated aboriginal population density on the basis of estimates derived from three sources of information:

Informants' censuses, informants' estimates (which usually are guesses of varying worth), and estimates of early writers, including several rough censuses by the Indian Office. The first is probably the most accurate, but for about 1870 to 1880, a time when the population had been reduced by war and disease and, in some areas, seriously dislocated from its former habitat.

Steward (1938: 264-8) estimated the population of various Shoshone tribes living in Montana, Idaho, and northern Utah; and cited ethnographic data pertaining to the hunting territory claimed by the Shoshone; e.g., according to Hall (1866: 200) "The Shoshones . . . range about the headwaters of the Yellowstone, Gallatin, Madison, Snake, and Green Rivers."

Much of the pertinent ethnographic data seems to support the implications of the archaeological data recorded in the survey area, viz., that the Shoshone lived in Idaho and adjacent territories, but made annual or semi-annual excursions to the Northwestern Plains. Steward (1938: 47, Fig. 6)

estimates that the prehistoric population density of a large portion of the Montana Southwestern Sub-Region (and a small segment of the Gallatin area) was approximately one person per 22.5 square miles. Accepting this figure, the aboriginal population of the Gallatin area, circa 1880, was approximately 150 persons. Steward (1938: 48) states:

The average density for the entire area was probably near Kroeber's estimate of one person to 15.6 square miles . . . there was, however, a striking local variation which correlated with the fertility of the natural environment.

Population Estimates: The prehistoric population of the Gallatin area might best be estimated by means of a combination of the several "approaches" that have been discussed; bearing in mind, of course, the limitations imposed by the unconscionable absence of empirical data. A tentative estimate of the prehistoric population could be based on the physical dimensions of the recorded sites, for, according to MacNeish (1956: 143):

The area covered by the Lerma refuse ranged from 50 to 250 sq. ft. From this it may be estimated that groups were small, consisting of one or two nuclear families (four to ten people?).

Assuming that four people occupied an area of fifty square feet; each person had available approximately twelve square feet. On the other hand, if ten people occupied an area of 250 square feet, then approximately fifteen square feet were available to each person. The present author suggests that the optimum amount of occupation area or

lebensraum per person averaged 400 square feet: this amount of space could be considered analogous to the "social density" of the aggregation. If each person living on a site required or had available some 400 square feet of lebensraum, then an approximate estimate could be made of the maximum population of a given site.

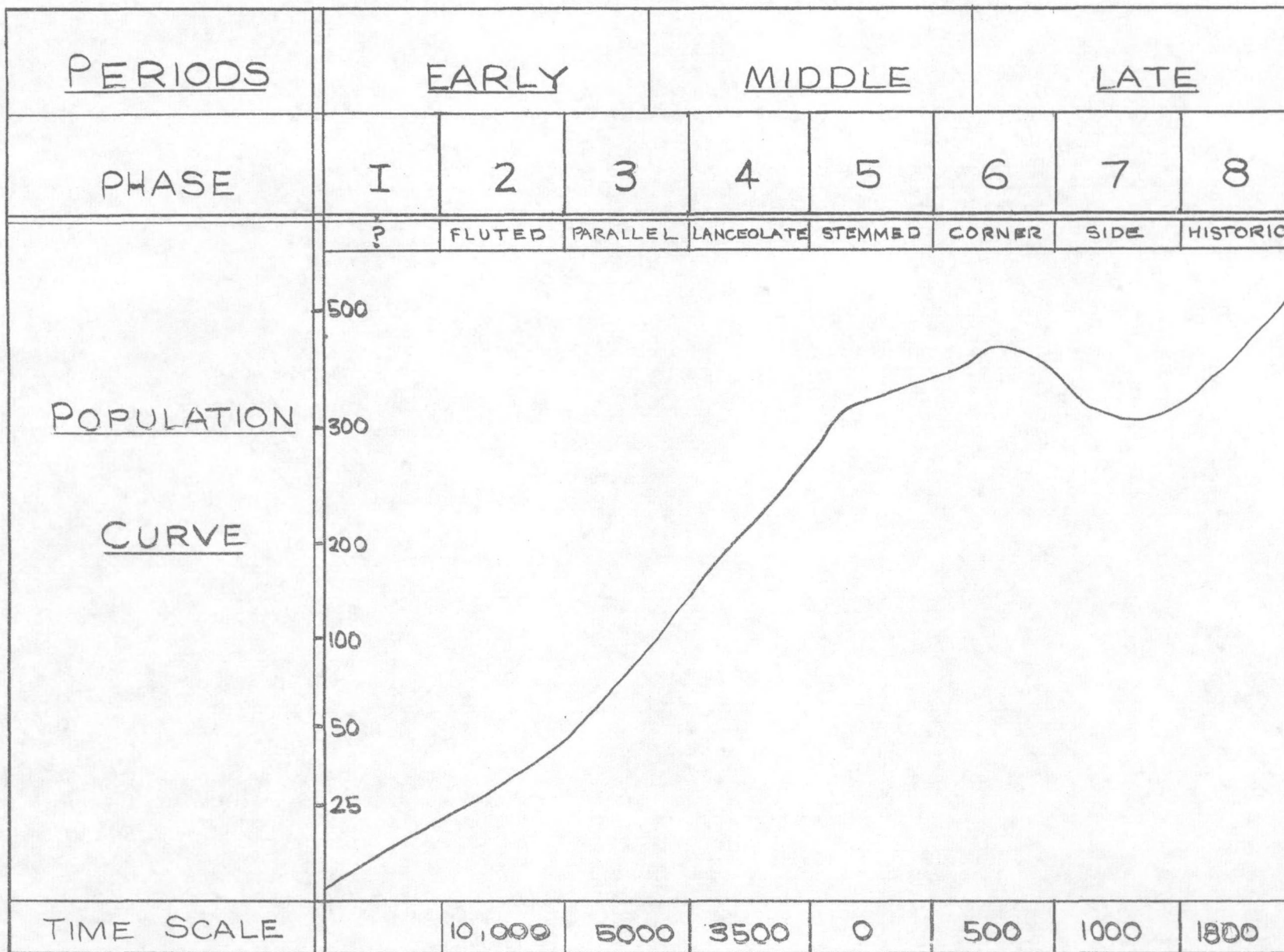
During the Early Period (prior to 5000 B.C.) the population of the Gallatin area might have been less than thirty-five persons. MacNeish (1956: 146) estimates that there were only four to ten people in comparable hunting groups. "Class One" defined by MacNeish(1956: 143) is widespread in North America. "Class One" consists of

a people with a hunting subsistence pattern, a nomadic way of life, who lived in small groups in temporary camps . . . and had a series of crude tools, such as choppers, plano-convex scrapers, square-based knives, stemmed and snub-nose end scrapers, and large, thick, lentoid projectile points.

According to Wedel (1956: 84):

Early hunters were essentially nomadic . . . local groups of limited size . . . of small bands or family groups. Bison hunting, however, is most productive when pursued on a cooperative group basis . . . The total population . . . was small and sparse.

It would appear, pending intensive study of appropriate sites, that thirty-five persons was the maximum Early Period population of the Gallatin area. Approximately eighty "Foraging Hunters" lived in the Gallatin area during the Middle Period. McKean projectile points, a characteristic artifact of this period (Mulloy 1954: 432-60), seem to be



--FIGURE 42--

scarce in the Gallatin area; however, it is likely that more will be found. "Communal Hunters" numbering approximately 300 persons occupied the Gallatin area during the latter phases of the Middle Period. "Communal Hunters" may be equated with Beardsley's "Restricted Wandering" communities (Beardsley et.al. in Wauchope 1956: 136-38). Corner-notched projectile points are typical of the late Middle Period. In the terminal phase of the Late Period, that is, during "Phase Two" (Malouf 1960: 13), "Mounted Hunters" occasionally occupied the Gallatin area. They used side-notched projectile points. The Gallatin area was probably included in the hunting territory of two or more social aggregations (or tribes) consisting of 300 - 500 persons.

These estimates seem to be reasonably consistent with other, more general estimates. Kroeber, in Cultural and Natural Areas of Native North America, states that the aboriginal population density of the continental United States was 4.0 persons to 100 square kilometers (K2).

$$100 \text{ K2} = 38.51 \text{ square miles (M2)}$$

$$(36.00 \text{ square miles equals one township})$$

The Gallatin area is some 3,000 M2 in extent; or thirty-eight townships. Therefore

$$38 \times 4 = 332$$

persons per square mile: assume 300 persons.

$$3,000 \text{ M2} \div 300 = 1.00 \text{ person per 10 M2}$$

Thus, the Gallatin area might have had a prehistoric popula-

tion of one person per ten square miles.

The statistics presented in Table 13 are derived from estimates prepared by Kroeber (1939: 134-9). The table lists the estimated population of several tribes whose hunting territory may have included the Gallatin area.

The prehistoric population density of Montana might have averaged 2.70 persons per K2, or 1.00 person per 13 M2. According to the estimates made by Lewis and Clark (Thwaites 1905) in Montana there were

Shoshone	3,000
Crow	4,000
Blackfoot	3,000
Flathead	<u>2,800</u>
	12,800

Montana covers 147,138 M2. Therefore

$$147,138 \div 11.5 = 1.00 \text{ persons in } 11.5 \text{ M2}$$

in Montana.

$$(1.00 \text{ persons in } 10.0 \text{ M2})$$

in the Gallatin area.

These figures indicate that during the Christian era, the prehistoric population in the Gallatin area might have averaged approximately 300 persons.

Table 13: Aboriginal Population Density, Montana

	Total	Unit 100(2)K	Density 100(2)K
Shoshone Bannock Paiute	3,000	2,886	1.04
Crow	4,000	1,527	2.61
Blackfoot	15,000 (5,000)	3,464	4.33
Kalispel Coeur d' Alene Pend d' Oreille Flathead	2,800	1,861	1.50
Total	14,800	9,738	--
Average	3,700	2,434	2.70
(Gallatin)	300	83	3.60
(Continental)			4.00

CHAPTER X

CONCLUDING SUMMARY

This chapter consists of (1) an outline of the salient points of the preceding nine chapters, (2) an evaluation of the survey project hypothesis, and (3) the concluding summary.

Outline: I. Montana includes a portion of two major physiographic regions bisected by the Continental Divide. These regions are (1) the mountainous western third of the State, and (2) the broken plains of the eastern two-thirds of the State. The physiographic and climatic dichotomy may be reflected culturally, as well as archaeologically. East of the Continental Divide, the prehistoric economy was based on bison hunting; west of the divide the Indians depended on a diversified hunting and gathering economy. This situation is demonstrated, on a small scale, by the archaeological remains found in the canyon and valley portions of the Gallatin area.

II. The material culture of some of the archaeological sites located in the Gallatin area exhibits the influence of traits which emanated from the Plateau, "Plains-Woodland," and Desert cultural traditions. These traditions were extant in major physiographic provinces contiguous to the Montana Southwestern Sub-Region. The latter is a

discrete archaeological territory located east of the Continental Divide, but geographically differentiated from the plains by a series of mountain ranges. Approximately 15,000 square miles in extent, the sub-region includes several large intermontane valleys. The archaeological remains found in this region are characterized by a unique combination of cultural traits.

III. The Gallatin area, which covers more than three thousand square miles, includes Gallatin County, the drainages of the east and west branches of the Gallatin River, and portions of the Madison, Jefferson, and Yellowstone River valleys. The survey area is composed of two major units: the Gallatin Canyon and the Gallatin Valley. The canyon is ecologically similar to the montane biome of the Montana Western Region; the valley is ecologically affiliated with the Northwestern Plains region.

IV. This chapter consists of an outline of the prehistoric and historic Indian and Caucasian occupation of the Gallatin area. The commentary is based on available ethnographic data, pioneer journals, and other documentary material.

V. The survey project model and field procedure is summarized in this chapter and the archaeological sites are arranged in spatial, chronological, and typological relationships.

VI. Forty-five sites recorded by archaeological

survey in the Gallatin area are described in this chapter.

VII. The lithic materials and artifacts found in the survey area are discussed in this chapter, and the artifact typology is systematically described.

VIII. The archaeological sites and materials reported in the preceding chapters provide a basis for tentative observations regarding the archaeological, ecological, and cultural implications of the data obtained by surface survey. The archaeological sites are assessed as manifestations of the Montane cultural tradition. The available evidence suggests definition of at least two prehistoric lifeways; (1) perennial occupation based on subsistence obtained by means of communal bison drives, and (2) an older, generalized hunting culture based on individual or small-group pursuit of a variety of megafauna.

Comparison of the artifact inventories of the archaeological sites found in the canyon and valley indicates that ecological factors exert profound influence on the character of the material culture.

IX. The prehistoric population density in the Gallatin area is estimated by means of data derived from various sources. Chapter IX includes numerical estimates of the aboriginal population of the survey area during various culture periods.

Evaluation of the Project Hypothesis: The material

culture of the Gallatin area archaeological sites reflects the influence of the Plateau and Plains traditions. Minor traits of the Desert Cultural tradition are represented in the Gallatin area and in southwestern Montana. These archaeological traits are believed to be sufficiently distinct to warrant cognizance of the "Montana Southwestern Sub-Region" as a discrete archaeological territory. The validity of this concept will be tested by future investigation.

Conclusion: The West Gallatin River begins in the remote mountains in Wyoming. It flows through a narrow canyon, into a great valley, and down to the wide Missouri. Through the canyon and valley has flowed a vigorous mainstream of prehistoric culture: the complexity of this tangled current is indicated by the archaeological remains found in the Gallatin area.

The sites recorded by preliminary archaeological survey in the Gallatin area were for the most part occupied by small "Restricted Wandering" social aggregations. Their economy was based on the cooperative hunting of several species of megafauna (primarily bison) and the unspecialized gathering of various vegetal resources. Growth of the indigent prehistoric population might have been constrained by their nomadic lifeway; their economy, which produced uncontrolled extremes of plenty and paucity; and the rigors of the winter climate. These circumstances militated against

cultural development beyond an unsophisticated, essentially upper Paleolithic or early Mesolithic culture.

The highly generalized Montane cultural tradition evidently persisted in the Gallatin area from the time of man's arrival on the eastern slopes of the Rocky Mountain cordillera until the time of Caucasian contact some 8,000 to 10,000 years later. The Gallatin area may have been but slightly affected by the Altithermal, a period of aridity on the Great Plains. It would appear that the Gallatin and adjacent montane areas were suitable for continuous occupation, viz., in comparison to portions of the Montana Western Region and the Northwestern Plains.

The Gallatin area was favored for winter or perennial occupation, judging from the archaeological material and the ecological context of several sites found in the central valley. The material culture of most of the archaeological sites found in the Gallatin Canyon indicates local manifestation of a symbiotic hunting-band hunting-territory lifeway that was fundamental to the Montane cultural tradition.

The author wishes to call to the reader's attention three published reports describing archaeological surveys made in localities adjacent to the Gallatin area. These are: The Archaeology of the Canyon Ferry Region, Montana (Malouf 1950); A Report of Preliminary Archaeological Investigations in Yellowstone National Park, Wyoming (Taylor 1964); and The Birch Creek Papers (Swanson, et.al. 1963, 1964). (The

Canyon Ferry region is immediately north of the Gallatin area, Yellowstone Park is to the southeast, and the Birch Creek valley is located some 100 miles southwest of the Gallatin area.)

A comprehensive survey of archaeological sites found in Alberta, Canada, written by H. M. Wormington and Richard Forbis, is to be published by the Denver Museum of Natural History. This report will be germane to the Gallatin area, since it is likely that a large portion of the archaeological manifestations found in Alberta and Saskatchewan are analogous to those found in Montana--particularly to that portion of Montana located on the Northwestern Plains. The archaeological manifestations found in the latter region are summarized in reports by Mulloy (1958) and Wedel (1961).

The immediate and perhaps most enduring value of preliminary archaeological survey in the Gallatin area rests in the collection, recording, and preservation of archaeological material. In the passage of but two decades, more than one-third of the recorded sites have been destroyed by construction, vandalism, and erosion. Subsequent archaeological endeavor in the Gallatin area should include vigorous efforts to preserve archaeological sites for future study. Intensive investigation of unsurveyed localities should be carried forward, in spite of--or more to the point, because of--the considerable damage suffered by the archaeological resources found in the area.

This report of preliminary archaeological survey in the Gallatin area constitutes a basis for subsequent study, but represents only a small portion of the research that will be necessary before our knowledge of the archaeology and culture of the canyon and valley will be reasonably complete.

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