The Sunset Creek Site (45-KT-28) and its place in plateau prehistory

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Report of Investigations No. 47
Washington State University
Laboratory of Anthropology
Pullman, Washington 1969
I. INTRODUCTION

The Wanapum Dam reservoir extends from a point four miles south of Vantage to Rock Island Dam, just south of Wenatchee, Washington. The Sunset Creek site, formally designated 45KT28, is located eight miles south of Trinidad on the west bank of the Columbia River, T. 19 N., R. 22 E., Sec. 12, Kittitas County, Washington. Occupying an area near the north end of Quilomene Bar,* this site is situated south of Lodged Pole Rapids and directly across the Columbia River from the Pot Holes, through which the overflow from the Quincy Basin irrigation system presently flows.

HISTORY OF THE FIELD WORK

In 1956 four coinciding circumstances led the Washington Archaeological Society to conduct a survey of both banks of the Columbia River between Vantage and Trinidad (see Fig. 1). First the society had been conducting excavations at the Hermit's, a site located a few miles downstream from Vantage (see Massey and Nelson 1958). Thus there existed a developing curiosity in the archaeological resources of the area. Second, there was growing concern over the impending construction of Priest Rapids and Wanapum dams and the potentially important sites which they would inundate. Third, Earl Swanson's (1956) doctoral thesis introduced new ideas about the area's prehistory and served as an impetus for further research. And fourth, Swanson's (1956; 1958) work at Schaake Village, slightly north of Vantage, had stimulated an interest in structural house remains of which little was known at the time. Thus the 1956 survey had as its object locating a site which would be inundated by Wanapum Dam, was areaely extensive with a deep surface deposit of midden, and displayed evidence of extensive house building.

The northern end of Quilomene Bar offered such a site, and preliminary testing was conducted in the fall of 1957. This demonstrated the high potential of the site and seven- to ten-day expeditions were sponsored each spring and fall from that time until the completion of Wanapum Dam in 1963. Between 1957 and 1960 the extensive surface midden at the site was explored, special emphasis being given to determining the nature of house structures. Then in the fall of 1960 a whole series of early components were unearthed below the main deposits at the site. The next two years were spent in excavating these early deposits, which eventually yielded approximately 650 artifacts.

THE PROBLEM

By the time the preparation of this report began seven cultural components had been defined which, it appeared, would provide a nearly complete cultural sequence dating back to 4000 or 6000 B.C. Moreover, the most recent component had yielded 3,950 artifacts, many of which were in association with a stratified sequence of three house types. The problem thus shifted from one of salvage archaeology to the integration of an important site within a still-emerging picture of Plateau prehistory.

ORGANIZATION OF THE REPORT

Such an integrative effort poses special problems, for it makes the site report serve two ends: (1) the minute description of large quantities of primary field data, and (2) the comparative analysis and integration of this data on a broad regional basis. In order to accomplish these two functions this report has been divided into five parts and three appendices. Part I is the introduction. Part II defines areal and temporal terms such as phase, component, subcomponent, Upper Columbia Region, Vantage locale, and the like. Part III relates the site to the Plateau and discusses general features of climate, ecology, physiography, and ethnography. Part IV describes site's archaeology, organizing it in terms of historical phases; it is thus both descriptive and comparative in nature. Part V is a general essay about Plateau prehistory. Appendix A describes the material culture in detail. Appendix B deals with field and laboratory methodology. Appendix C, by Carolyn Osborne, describes a collection of perishables from rockshelters around Quilomene Bar. A more detailed idea of the organization of the report may be gained by consulting the table of contents. The purposes and organization of each section and major subsection of the report are also set forth in

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*Quilomene Bar has never before received a formal title, although it has been known by numerous names over the past 100 years. Some time in the latter part of the nineteenth century it was purchased or homesteaded by a man named Collins. Later he sold the property to a man by the name of Booth, who built a ranch in its north-central section. In the meantime a man by the name of Osborn had settled a ranch near the mouth of Brushy Creek, a tributary of Quilomene Creek which empties into the Columbia at the south end of the bar. As a result the bar is presently known as Booth Bar, Osborn Bar, Collins Bar, and Quilomene Bar, while some prefer to call the south half Osborn Bar and the north half Booth Bar. The situation is further complicated by the use of the term "The Quilomene" to refer to an area around the mouth of Quilomene Creek and adjacent to Quilomene Rapids.

The name Quilomene Bar has been settled on for two reasons. First, Clarence Scammon, a resident in the area who is familiar with local history, informs me that Quilomene was the name originally applied to it. Second, the name Quilomene relates to the established terminology for Quilomene Creek and Quilomene Rapids.
II. DEFINITIONS

In order to maintain a measure of conceptual clarity it will be necessary to define both general areal terms such as Plateau, Upper Columbia, and Vantage locale, and more specialized archaeological concepts such as component, phase, and subphase. Whether or not these definitions correspond in detail to generally accepted views is largely beside the point since each has been designed as an heuristic device in the organization of data both from the Sunset Creek site and the Plateau as a whole.

AREAL TERMINOLOGY

The Plateau. What is the Plateau? To the general geographer and cartographer the Plateau often designates that area between the Cascade and Rocky mountain and north of the Great Basin. It is thus a large triangular area roughly equal to the Columbia-Snake river system. In addition the cartographer frequently uses the term Columbia Plateau to refer to that area between the Okanagon Highlands on the north and the Blue Mountains on the south, and between the Columbia River on the west and the eastern margin of the Palouse Hills.

The physiographer (see Freeman et al., 1945), on the other hand, has a somewhat more restricted and better defined idea of what the Plateau should and should not be. Thus the Columbia Intermontane Province is said to extend from the Waterville Plateau, the Channeled Scablands, the Palouse Hills of Washington southward to the Harney-High Desert, the Malheur-Boise Basin, and the Owyhee Upland of central Oregon and southern Idaho, with a finger extending up the Snake River Plain nearly to Yellowstone.

The ethnographer (see Ray 1939; 1942) thinks of the Plateau as a culture area including groups as far north as the Carrier and Sekani of central British Columbia, as far south as the Umatilla and Nez Perce, as far west as the Lillooet and Chilcotin, and as far east as the Kutenai and Flathead. Ethnographically speaking, then, the Plateau extends far northward into the Cascade Mountain system of British Columbia and eastward into the Rocky Mountains, while elsewhere it corresponds roughly with the physiographer's Plateau.

Archaeologists have never settled on a definition of the Plateau for archaeological purposes, although comparative studies in Plateau archaeology invariably take into account all the available data within the ethnographically defined Plateau. Such a one to one correlation is useful at the late prehistoric level of analysis, although sequences in the Fraser River valley clearly indicate that this area has not always been closely related to cultural developments in the rest of the Plateau (Borden 1962; Sanger 1963). This concept of what the Plateau constitutes has been used in this report only when discussing certain ethnographic relationships or when making archaeological comparisons on the late prehistoric level. Unless it appears in such a context, the term Plateau is used to refer to the semiarid or nuclear portion of the Plateau, an area roughly equivalent to the Columbia Basin Subprovince of the Columbia Intermontane Province (Freeman et al., 1945). This definition serves to limit the areal extent of what we call the Plateau to an area which is roughly equivalent to our archaeological knowledge and ecologically similar throughout.

Areal Divisions within the Plateau. Because it would be virtually impossible to create areal divisions which were meaningful in every period of Plateau prehistory, the divisions used here are matters of convenience largely reflecting geographically limited areas in which field work has brought to light large amounts of data. There are three such regions: the Middle Columbia, the Lower Snake, and the Upper Columbia.

The Middle Columbia region extends from The Dalles, Oregon, to Priest Rapids. In this area salvage archaeology in three major reservoirs in addition to some highway and pipeline salvage work has provided extensive quantities of field data. The major published sources for this area are presented in Figure 1.

The upper Columbia region extends along the Columbia River from Priest Rapids to the Canadian border and also includes the Sun Lakes-O'Sullivan Reservoir area (see Fig. 1). Salvage archaeology in six major reservoirs plus work for the state parks at Sun Lakes and Fort Spokane has made available a great amount of data to which this report is a contribution.

Within the Upper Columbia region we may single out the area in which the Sunset Creek site is located, giving it the title the Vantage locale. The Vantage locale extends along the Columbia River from Priest Rapids to Wenatchee. Sometimes the phrase, the greater Vantage locale, is used to include the additional area around Sun Lakes and O'Sullivan Reservoir.

The Lower Snake region extends from the mouth of the Snake River to its junction with the Clear-water...
ARCHAEOLOGICAL CONSTRUCTS OF TIME AND SPACE

The four terms to be discussed here are phase, subphase, component, and subcomponent. The concepts of phase, subphase, and component are adapted from Willey and Phillips (1958) and are in keeping with the precedent set by Swanson (1958; 1962a) for the Vantage locale. The term subcomponent has been adopted in order to sort out some of the complex cultural and stratigraphic units within one of the components at the site.

Phase and Subphase. Enlarging on the definition of Kidder (Kidder et al., 1946:9), Willey and Phillips (1958:22) offer a very encompassing definition of the term phase, saying that it is "an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time." The subphase is thought of by these authors as a more refined unit, primarily temporal in character and often reflected in changes in trait frequencies rather than trait occurrences. As Willey [4] and Phillips point out, where the line between the phase and subphase distinction is to be drawn will depend upon the researcher's analysis and may at times be rather arbitrary.

Although well within the limits of this definition, the systematic use of phases to describe events and periods in Plateau prehistory suffers from a basic liability. The defining criteria for phases in the Plateau are often weak, frequently being limited to stylistic changes in projectile points. This is true of four of the five recognized phases in the Vantage locale and the vast majority of phases elsewhere in the Plateau. This has led some archaeologists to discard the concept of phase and speak only of specific traditions and more loosely defined periods.

This unfortunate situation is due largely to sample sizes which tend to be quite small for all periods except the late prehistoric. It is also a function of sampling error, for the bulk of our knowledge comes from the riverside encampments. We know, however, that bands operating in the Plateau had a varied yearly economic round producing different kinds of sites and tool assemblages in different ecologic settings. This is clearly demonstrated by ethnographic and archaeological data (see below, comments on the Frenchman Springs Phase and the origin of the Cayuse Phase). As a result we can only reliably compare assemblages for a single such setting, the river bank.

The basic assumption which underlies the use of phases to organize Plateau prehistory is that changes in projectile point types are reflections of more basic changes in artifact inventory and/or ecological adaptation. These changes, it is further assumed, will become apparent as we accumulate more data. These assumptions are based in part upon emerging patterns not yet clearly defined in sequence but nevertheless strongly suggestive of sequential change. Thus the only Frenchman Springs Phase burials (represented at a single site) are extended rather than flexed as is characteristic of Cayuse Phase burials. However, we do not know what burial forms existed during the Quilomene Bar and Vantage phases. Therefore we cannot state that extended burials characterize the Frenchman Springs Phase and distinguish it from immediately earlier and later phases even though it is very possible that they do.

Cultural Component and Cultural Subcomponent. A cultural component is a manifestation of a phase or a subphase at a specific site and does not necessarily correspond to a geological stratum or stratigraphically defined subdivision thereof. The use of the term component is cultural and not geological in nature. The concept of the subcomponent has been developed in order to deal with a special problem in dealing with stratigraphic relationships within a specific component. At the Sunset Creek site the upper cultural component is contained in a thick layer of midden associated with sporadic pit house building. These pit houses and other stratigraphically bounded areas within the component can be arranged in a sequence, but areas not so bounded cannot because house building has produced extensive stratigraphic inversions. When the component as a whole is a unit of comparison these inversions are meaningless; but when we wish to examine change through the duration of component occupancy it is important that we distinguish the series of stratigraphically bounded subcomponents from the amorphous body of the component itself. It should be added that the analysis of the sequence of subcomponents proved of value in defining a series of subphases.

III. THE SETTING

An archaeological site is not simply a sequence of assemblages at a defined place in time and space, for each of its components records a particular cultural adaptation to the local physical and ecological environments. Moreover, it is possible to discern relationships between and within societies and cultures by relating many components in both time and space. Therefore, it is not enough to look at a site only in terms of itself; the broad cultural and ecological patterns of which it is a [5] part must also be considered. Although the fourth part of this report (The Cultural Record) is devoted to this kind of an analysis to an important degree, a few comments at this time will
serve to introduce the reader to some of the ecologic and ethnographic factors with which any student of Plateau prehistory must come to grips.

ECOLOGY AND PHYSIOGRAPHY

Because the Sunset Creek site is located along the Columbia River, it is situated in an area which is transitional between both ecologic and physiographic zones. As Swanson (1962a:2) has aptly noted, drainage and altitude are the keys to the differences between these zones. To the east lies the most depressed area within the Columbia Basin, the Central Plains section (Freeman et al., 1945). It receives between five and ten inches of rain per year (Landes et al., 1912:24; Piper 1906) and is very poorly drained. Indeed the most significant bodies of water in the area are a series of small lakes, some fresh and others saline, which are strung out in the Grand Coulee, a seafloor channel of Wisconsin age. The only continuously flowing stream in the area is Crab Creek.

This general lack of water is strongly reflected in the ecology and the availability of potential food resources for aboriginals who were hunters and gatherers. According to Dice (1943:42-44) the area is characteristic of the sagebrush lifebelt of the Palusian biotic province. Thus the ground cover is typically that of a semiarid area. The most important food resources are edible roots such as camas, wildfowl, and deer.

To the west of the Columbia River lies the Yakima Folds section, an extensive area characterized by narrow upfolds of basalt alternating with broad downwarped valleys which are oriented primarily in a northeast-southwest direction (Freeman et al., 1945). It is essentially a foothills area to the Cascade Mountains and is characterized by the bunchgrass and montane lifebelts of the Palusian biotic province, the climax of which is the Ponderosa pine (Dice 1943). On the average the area receives between ten and fifteen inches of rain per year. This rainfall coupled with discharge out of the Cascade Mountains, provides the area with numerous streams.

Some of the area's most important economic resources are great runs of steelhead trout and silver, blueback, and Chinook salmon. Deer, elk, wildfowl, and edible roots are also abundant, while bear, cougar, and mountain sheep are found in lesser numbers and berries become common as the Cascades are approached. Smaller game animals include badger, fox, marten, beaver, muskrat, mink, raccoon, porcupine, and bobcat.

It is obvious then that the Yakima Folds section has been of greater economic importance than the Central Plains section, a fact attested to by our ethnographic knowledge (e.g. Ray 1932). In fact, essentially the same kind of situation has prevailed since the beginning of the Alithermal, some 7,500 years ago. Prior to that time, however, cooler, moister, conditions prevailed (see Hansen 1944; 1947), and grasslands throughout the Central Plains section could have supported large herds of grazing animals such as bison. Such conditions are strongly suggested by the remains of bison at the Lind Coulee site (Daugherity 1956a).

Although this statement of physiographic and ecologic relationships is specifically designed to be applied to the greater Vantage locale, similar trends would be seen if we were to consider transects originating in the Central Plains section and terminating in areas such as the Blue Mountains to the south, the Okanagon Highlands to the north, or the foothills of the Rocky Mountains to the east. In other words, those areas which are peripheral to the central portion of the Columbia Basin have tended over the last seven or eight millennia to be ecologically most favorable to hunting and gathering societies, a tendency evident in archaeological, ethnographic, and early historic documents.

ETHNOGRAPHY

General ethnographic descriptions which are particularly useful to the archaeologist include works by Ray (1932; 1936; 1939; 1942), Teit (1900; 1906; 1909; 1928; 1930), Spinden (1908), Spier and Sapir (1930), and Suttles and Elmendorf (1962). These and other works are used hereafter in the discussion of specific problems, three of which may be profitably outlined at this time.

1. Can the origin or development of ethnographically recorded Plateau culture be discerned in the archaeological record? The answer to this question is closely related to winter village patterns which are characteristic of historic Plateau culture. These patterns may be defined in the archaeological record and, as Swanson (1962a) noted, are the key to defining the emergence of Plateau culture. This problem is discussed in some detail in comments on the origin of the Cayuse Phase.

2. Students of ethnographic Plateau culture have long since noted the great influence of Plains horse culture on Plateau peoples and concluded that it dated from a recent prehistoric period. Is this influence detectable in the archaeological record? This problem is considered in a discussion of the Cayuse III Subphase.

3. With the exception of some Athabascan and Kutenai speakers in the far north, the Plateau is divided between two massive linguistic blocks, interior Salish and Sahaptin. The Sahaptin area coincides roughly with the
dry, unforested southern portion of the Plateau, while Salishan speakers occupy the vast timbered regions north of the Columbia and Spokane rivers, penetrating the semiarid Plateau only as far south as the Saddle Mountains, a few miles down the Columbia River from the Sunset Creek site. We may ask, then, if any dialogue between the Salishan and Sahaptin portions of the Plateau can be discerned in the archaeological record. Speculations regarding this problem are presented in comments about the significance of the Cayuse Phase.

These three problems entail an archaeological approach to rather broad ethnographic patterns and say little of the specific ethnography or early history of the Vantage locale in which the Sunset Creek site is located. To the extent that such information is pertinent it has been incorporated at advantageous points in the text of the report, especially in the discussion of the Cayuse Phase and the description of the material culture of the site (Appendix A). Gunkel (1961:1-38) has summarized ethnographic information for the Upper Columbia and reviewed the local archaeological research prior to 1960.

IV. THE CULTURAL RECORD

The major purpose of this section of the report is to organize and present the site's cultural record as it reflects and is a part of the prehistoric record of the Plateau. The greatest emphases are placed on presenting and organizing field data, defining archaeological phases, and tracing historical relationships. However, questions are also asked which deal directly with the processes of change and the significance of certain archaeological phenomena. Where discussions are speculative or hypothetical they are labeled as such and should be treated with appropriate caution.

On a more particular level of analysis, this section of the report has been divided into three subsections which are designed to present the cultural record in a cogent and comprehensive fashion. In the first of these the reader is introduced to the site and its stratigraphy, the cultural components, and the various archaeological phases which these represent. This foreshadows the next subsection, organizing it in the mind of the reader, and thereby allowing him to evaluate and more easily assimilate the considerable amount of data which it contains.

In the second subsection two distinct levels of data integration are simultaneously presented. On the one hand primary field data are technically evaluated and described through a presentation of cultural components which are treated in the order of their historical occurrence at the site. On the other hand, these components are organized and presented in terms of the archaeological phases which they represent. In other words, for any particular phase a series of components is described in detail and then these are compared with one another and to related components recognized elsewhere in the Plateau. By discussing the significance of components in terms of the phases which they represent, significant questions are automatically asked regarding historical relationships and the significance of the data recovered form 45KT28.

In the third subsection some important trends in the cultural record are documented in terms of the distribution and changes in artifact and pit house types. Here the emphasis is upon defining continuity within the sequence of phases in the Vantage locale.

THE SITE AND ITS STRATIGRAPHY

The Site. The Sunset Creek Site, 45KT28, is situated at the north end of Quilomene Bar where Sunset Creek empties into the Columbia River. It extends southward from this creek's mouth in a long, narrow ribbon which flanks the Columbia (Figs. 1 through 4). Directly across the river, to the east, a huge scabland channel flood bar marks the entrance to the Pot Holes, a scabland channel remnant dating from late Wisconsin times. A short distance to the south this steeply faced bar terminates against rugged cliffs which plunge vertically into the Columbia River. To the north it gradually loses its steep scarp, intersecting and covering a series of low basalt benches and projecting westward in a gently sloping tongue which forms a shallow bend in the Columbia River and marks the white water known as Lodged Pole Rapids. Directly across from this tongue of land a sheer cliff 600 feet in height towers above the river, sealing off the north end of Quilomene Bar. One-half mile to the south this cliff is broken by a deep, V-Shaped canyon carved into the basalt bedrock by Sunset Creek whose alluvial fan spills around the end of the cliff and forms the northernmost portion of Quilomene Bar.

The site is located along the southwestern margin of this fan and on the adjacent river flood plain. To the south, Quilomene Bar extends for three miles, terminating in a high, steeply faced scabland channel floodbar whose surface is deeply pocked with giant kettles. Quilomene Rapids is adjacent to the end of this ancient bar, and Quilomene Creek, the largest stream in the immediate area, cuts through the aeolian and floodplain deposits at its base.

In addition to the Sunset Creek Site, two other pit house sites and at least three separate burial sites are
located on Quilomene Bar. In the high, terraced basalt cliffs which rim the bar there are also a series of storage shelters. The survey of these shelters is reported in Appendix C.

Site Stratigraphy. Interpretation of the stratigraphic sections at 45KT28 has been done with the aid of Mr. Roald Fryxell, who has visited the site and prepared a geological map of the northern part of Quilomene Bar. This information will be published at a later date.

The geological section at the site reveals interbedded floodplain and alluvial deposits which are frequently altered by aeolian processes. These deposits were tested to a depth of nineteen feet in two separate locations and to depths of between six and eleven feet at six other stations within the confines of the site (see Fig. 4). On the basis of these excavations six major strata have been recognized. The earliest of these are apparently Altithermal in age and consist of alluvial gravel associated with the Sunset Creek alluvial fan (Stratum 1), a brown-yellow beach sand (Stratum 2), and a more finely textured, grey-brown sand (Stratum 3). The stratigraphic relationships between these strata may be seen in Figures 5, 6, and 10.

The tests in these deep strata, which ranged from twelve to nineteen feet below the present ground surface, were not extensive. Nevertheless, they revealed several cultural assemblages, one of which was sufficiently large to be assigned to the earliest phase currently defined in the Vantage locale.

Mantling these early deposits is a thick layer of sand and floodplain loess roughly equivalent to the first half of the Medithermal. Designated Stratum 4, this deposit varies from seven to ten feet in thickness and contains many culture-bearing lenses. The earliest of these represent the Frenchman Springs Phase and the more recent the Quilomene Bar Phase.

Stratum 5 is a deposit of midden, house fill, and floodplain loess which varies from four to six feet in thickness and is coextensive with Cultural Component VII. The cultural assemblage from it represents the Cayuse Phase at the site.

Stratum 6 is a thin mantle of fully historic deposits including the flood silts of the 1896 and 1948 floods. It contains a variety of historic artifacts as well as a few secondarily deposited aboriginal items.

THE CULTURAL CONTINUUM

Seventeen lithologically bounded culture-bearing units yielded seven definable cultural components representative of four of the five phases known to be present in the Vantage locale. The following is a list of these phases and the number of components which represent each: (1) two cultural components representing the Vantage Phase, (2) the Cold Springs Phase which is net represented at the site, (3) three components representing the Frenchman Springs Phase, (4) one component representing the Quilomene Bar Phase, and (5) one component representing the Cayuse Phase. There phases are shown in Figure 34 in relationship to the site stratigraphy, their representative components at the site, and the development of projectile points in the Vantage locale. By studying this figure the reader will be able to anticipate the organization of this subsection in which each component and each phase is considered in detail.

The Vantage Phase

The designation "Vantage Phase" is being reapplied from Swanson (1962a:39). Because the samples which he and I have procured are both quite small, it is not surprising that there is not a duplication of diagnostic artifact types. This may be partly explained by the nature of the deposits at Cedar Cave, Duck Cave, and 45KT28. At the former sites about fifteen specimens were recovered, the most diagnostic of which was an edge ground cobble (Swanson 1962a:42-43, 70). At 45KT28 the sample was considerably larger, but housed in redeposited sands which were water laid by a current too weak to move cobbles and other large objects. Consequently the most diagnostic artifacts recovered from this site are knives and projectile points. Thus the assemblages which Swanson and I separately characterize as deriving from the Vantage Phase cannot be positively shown to be culturally coeval. They do, however, occupy comparable positions both stratigraphically and in the cultural continuum of the Vantage locale.

Unlike Swanson's model, the Vantage Phase shall not be subdivided in this report. Although the two Vantage Phase components at 45KT28 display apparent cultural differences, they have not been characterized as subphases because the sample from each is far too small and incomplete. However, each component will be described separately.

CULTURAL COMPONENT I

Stratigraphy. Cultural Component I, encountered in the excavations at House Pit 15 (Fig. 4), was contained in two lenses of coarse sand located in the upper portion of Stratum 3 just above a small, alluvial-filled stream channel
associated with the development of the Sunset Canyon Fan (Figs. 5 and 6). Although both lenses were culture bearing, the deeper of the two, where it intersected and crossed the channel fill, was particularly productive. This fact is easily explained by the mode of deposition. During a sheet flood or period of high water, a culture-bearing deposit was eroded somewhere to the north and west of the excavations, whisking the smaller artifacts, flakes, pebbles, and other cultural debris down the inclined bank of the river. The debris moved freely along this surface, except at the place where the (gravel) channel fill had been exhumed during a period of erosion. At this point the gravel of the channel fill lessened the slope and provided an irregular surface on which flakes and artifacts might naturally accumulate.

Two test excavations, beneath House Pits 7 and 28 (Fig. 4), failed to reveal the source area for the cultural materials of Cultural Component I. Lack of time and insufficient funds prevented further testing.

Artifact Assemblage. Although small, the assemblage of 62 artifacts contained several fragments of leaf-shaped points and knives. Two of the point bases which were recovered are slightly shouldered (Fig. 7, c-d). They resemble specimens recovered by Borden from the early levels of DjRi3, near Yale, British Columbia (Borden 1957), and occasional specimens which occur in Olcott assemblages along the Puget Sound littoral (Butler 1961). Other characteristic artifacts are illustrated in Figures 7 and 8.

The following is a complete catalogue of the artifacts recovered from Cultural Component I. Bone artifacts were not present because bone was not preserved. Stone detritus was common, several hundred flakes of cryptocrystalline silica having been recovered. Ten basalt flakes were also recovered, suggesting that cobble implements may have been used. In Cultural Component III, where cobble implements were recovered, the percentage of basalt flakes was also quite low.

Artifact Catalogue.

Chipped stone artifacts (61)
   Stemmed projectile points (1)
      (1) Form 11 (Fig. 8, e)
   Leaf-shaped Points and knives (4)
      (4) Type 1 (Figs. 7, a-d; 43, d, f, h-i)
   Fragments of points or knives (2)
   Knives (12)
      (2) Type 1 (Fig. 7, g-h)
      (2) Type 2 (Fig. 7, e-f)
      (1) Style 10 (Fig. 7, i)
      (1) Form 8 (Fig. 7, j)
      (6) Form 9
   Core tools (6)
      (3) Type 1 (Figs. 7, k-l; 53, e)
      (2) Type 2
      (1) Form 2
   Scrapers (14)
      (2) Type 1 (Figs. 8, b; 54, b)
      Type 2 (4)
      (4) Type Variant 2D (Figs. 8, a; 56, a)
      Type 3(1)
      (1) Type Variant 3A (Fig. 8, c)
      (1) Style 1
      (1) Style 3
      (3) Style 4 (Fig. 56, k)
      (2) Form 3
   Utilized Flakes
      (19) Utilized flakes
      (2) Micro blades (Fig. 61, e)
      (1) Possible crescent fragment (Fig. 8, d)
   Stone percussion tools (1)
      Hammerstones (1)
      (1) Style 1

Total number of artifacts (62)
CULTURAL COMPONENT II

**Stratigraphy.** Cultural Component II is situated in the lowest portion of Stratum 4 between six inches to one foot above the uppermost lens of Cultural Component I (Figs. 5 and 6), and is characterized by scattered, discontinuous lenses of compact yellow-brown silt or clay. Though shown in the profiles as directly underlying Cultural Component IV, this component exists elsewhere, where it underlies Cultural Component V. Because the lenses are water deposited, we are faced with the problem of redeposition, probably from a nearby source.

**Artifact Assemblage.** Although only eight artifacts were recovered, several of these proved to be diagnostic (Fig. 8, f-j). These specimens included three leaf-shaped points, a rudimentarily stemmed point, and a large, leaf-shaped knife whose base is stemmed. Since simply stemmed points are present in Cultural Component III, it is likely that Cultural Component II represents the end-point of the Vantage Phase. This is also indicated by one of the leaf-shaped points (Fig. 8, h), which is much smaller than the other points from the Vantage Phase, and correspondingly like those of the Frenchman Springs Phase.

The following is a complete catalogue of the artifacts recovered from Cultural Component II. In addition, only a handful of cryptocrystalline flakes and a few basalt pebbles were recovered.

Artifact Catalogue.

Chipped stone artifacts (8)
- Stemmed projectile points (1)
  - Type 1 (Fig. 8, j)
- Leaf-shaped points and knives (3)
  - Type 1 (Fig. 8, f-g)
  - Style 1 (Fig. 8, h)
- Knives (2)
  - Form 8 (Fig. 8, i)
  - Form 9
- Scrapers (1)
  - Type 1
  - Utilized flakes

Total number of artifacts (8)

FLAKES AND ARTIFACTS FROM BENEATH CULTURAL COMPONENT I

One point base and twenty-three cryptocrystalline silica flakes were recovered from beneath Cultural Component I. They were housed in pockets of brown clay and on iron-stained surfaces of sand stratigraphically more recent than the gravel channel fill beneath Cultural Component I (Figs. 5 and 6). The flakes coming from each of these lenses were usually struck from the same piece of material. There were only two exceptions to this. One lens contained five flakes of one material and two flakes of another material. Another contained six flakes of one type of agate, and a point base of differing material (Fig. 8, m). Though all of the lenses in question are water deposited, it is doubtful that the cultural materials which they contain could have been moved far and yet remain so perfectly segregated according to material. They are thus of about the same age as the deposits in which they are housed, probably more recent than Cultural Component I and possibly of about the same age as Cultural Component II.

CULTURAL MATERIALS RESTING ON CULTURAL COMPONENT I

A total of 30 artifacts, 80 cryptocrystalline silica flakes, and 3 "bolas stones" were found resting on the lower sand lens of Cultural Component I. The enamel of a beaver or muskrat tooth and two river cobbles were also recovered. The diverse nature of these specimens, ranging from minute flakes to a core weighing three pounds (Fig. 9), the survival of the tooth enamel, and the fact that flakes struck from the same core were often found side by side all suggest that these are the earliest in situ deposits in the House Pit 15 area.

Artifact Assemblage. Unfortunately, the most diagnostic artifacts recovered from these deposits were cobble scraping planes (Fig. 65, a-c) similar to those of Cultural Component III. Thus it is difficult to assign the assemblage to either the Vantage or Frenchman Springs phases.

Artifact Catalogue.

Chipped stone artifacts (25)
- Fragments of points or knives
DISCUSSION

Because the assemblages from both of the vantage phase components have been redeposited, it is not possible to estimate accurately their age on the basis of geological information alone. The strata in which they occur are estimated to have been deposited between 1000 and 3000 B.C., a minimal date for the age of the cultural assemblages themselves.

Indeed, based on the few comparisons of material culture that can be made. Cultural Component I is probably no more recent than ca. 4000 B.C. and very possibly as old as 7000 B.C. The large leaf-shaped points which characterize this component are comparable to specimens which Borden has reported from the early components at DjRi3, a site on the Fraser River in British Columbia (Borden 1957). Based on geological estimates and a series of Carbon 14 dates, these components at DjRi3 span the period between 5000 and 7000 B.C. Although there are no other dated occurrences, such points are characteristic of many early assemblages from the Puget Sound littoral (Butler 1961; Thomson 1961). Moreover, the large, slightly shouldered leaf-shaped points from Cultural Component I also find counterparts in both these assemblages.

Based on the assemblages at hand, Cultural Component II appears to be substantially more recent than Cultural Component I, possibly in the neighborhood of 2000 to 3000 B.C. This estimate is based on the occurrence of a Type 1 stemmed point and a Style 1 leaf-shaped point, both common in the early Frenchman Springs period.

Although the slightly shouldered leaf-shaped projectile points and the large leaf-shaped knives from Cultural Components I and II suggest that there is a close typological link between the Vantage Phase and the earliest assemblages from the Puget Sound littoral and the Fraser River valley, the flaking techniques employed in tool manufacture are basically like those recorded from other Anathermal and Altithermal sites in the Plateau.

The flaking detritus from Cultural Components I and II reveals that low angle cores with faceted striking platforms were used to produce many of the flakes from which tools were subsequently manufactured. Although smaller in size, these flakes and flake tools are otherwise very similar to those from the Lind Coulee site (Daugherty 1956a; 1965: personal communication) and the Lind-Coulee-like assemblage at Thorn Thicket (45WT36), a site on the Lower Snake River (Roderick Sprague 1966: personal communication). Platform-faceted flakes and blades of a slightly different type also have been reported from more recent Altithermal components along the Lower Snake River (C. M. Nelson 1965a; 1966) and the Middle Columbia River (Butler 1959:13), and evidence for various kinds of platform faceting exists from every component at the Sunset Creek site.

Although flakes with faceted platforms exist in surface collections from the Fraser River valley, they are more recent than the Anathermal and Altithermal specimens from the Columbia Plateau. Moreover, platform faceting has not yet been reported from the early materials in the Fraser River valley or the Puget Sound littoral.

THE VANTAGE PHASE AND THE OLD CORDILLERAN CULTURE

Introduction. The Vantage Phase components are two of the many early occurrences of leaf-shaped projectile points and knives in the Pacific Northwest. Recently, Butler (1958c; 1961; 1962a; 1965) has used the distribution of such
projectile points, associated artifacts, and ecological information to postulate the existence of an Old Cordilleran Culture.

As Butler (1965) himself has pointed out, the Old Cordilleran Culture concept was developed as a tool for visualizing Northwest prehistory in terms of itself rather than an extension of Great Basin or Plains patterns of prehistoric development. The fact that Butler recognized the fundamental ecological unity of early archaeological assemblages in the Pacific Northwest represents a major contribution to our understanding of archaeological sequences in the area. However, accumulating archaeological data now suggest that the Old Cordilleran Culture concept may not account for these fundamental similarities. It is my purpose to review the relationship between the archaeological content of the Old Cordilleran Culture concept and the known archaeological data, and to demonstrate that alternative hypotheses can be developed which are simpler and account for the known data more completely.

In 1961 (64-65), Butler stated that the only highly diagnostic tool type characteristic of the Old Cordilleran Culture was the leaf-shaped Cascade projectile point. Relying heavily on information obtained from a single site near The Dalles (Butler 1959:13), he further suggested that these projectile points were made on blades struck from large conical cores. In addition to Cascade Points, the Old Cordilleran Culture was characterized by the more ubiquitous leaf-shaped knives, unifacially flakes cobble tools, and unspecialized scrapers and flake tools.

Using information from the Fraser River valley (Borden 1957), the Puget Sound Littoral (Butler 1961), The Dalles (Cressman 1960; Butler 1958c, 1959, 1962), the northern Great Basin (Cowles 1959), and the Lower Snake River (Butler 1958b), Butler postulated that the Old Cordilleran Culture had developed along the foothills of the Cascade Mountains between northern Puget Sound and the northern Great Basin between ca. 12,000 and 13,000 B.P. (Butler 1961:63-64). He also speculated that it might have spread westward into the Puget Sound lowlands between ca. 7000 and 8000 B.P. and eastward across the southern Columbia Plateau after its emergence in The Dalles locale between 10,000 and 11,000 B.P.

In 1962a (77-78), Butler expanded his original thesis, enumerating the following characteristics for the Early Dalles Phase of the Old Cordilleran Culture: "a well developed bone and antler industry; blade implements, including the finely made 'willow-leaf' Cascade points and end-of-blade scrapers; the edge-ground cobble complex; hunting of such large mammals as deer and elk, and, apparently, large numbers of birds; and intensive, probably seasonal, exploitation of such riverine resources as fish." He also suggested that the Old Cordilleran Culture spread eastward from The Dalles locale into Idaho between 7000 and 8000 B.P.

In 1965 (1127), Butler extended these characteristics to the entire Old Cordilleran Culture and added unifacially beveled antler wedges to his list of diagnostic traits.

If Butler's treatment of the data is accepted without critical analysis, then the Vantage Phase may be seen as an early extension of the Old Cordilleran Culture from the foothills of the Cascade Mountains into the western margin of the Columbia Plateau prior to 7000 or 8000 B.P. Such an extension would be considered analogous to the occupation of The Dalles area. Although this point of view is superficially supported by the typological similarity between the projectile points from the western Cascades and the Sunset Creek site, a critical appraisal of all the comparative data suggests that the entire Old Cordilleran Culture concept must be revised.

Previous reviewers of the Old Cordilleran Culture concept have pointed out that there is considerable ambiguity about the specific nature of the Old Cordilleran Culture because its constituent elements and regional phases have not been clearly defined (e.g., Carlson 1962;Gruhn 1962). Although Butler's (1965) most recent reply to these criticisms has helped to clarify some of the issues, it has only complicated others. For example, prior to the reply, the Early Dalles Phase was the only well defined regional component in Butler's hypothesis (Butler 1962a). When Butler (1965) extended all of the characteristics of the Early Dalles Phase to the entire Old Cordilleran Culture, he limited the possibility of defining regional phases while adding a considerable amount of detail to the archaeological content of the Old Cordilleran Culture, itself. On the one hand, this expansion of the overall construct is clearly useful since it embodies a more specific and more easily tested hypothesis. But, on the other hand, the apparent reversal of Butler's earlier concept of regional phases makes it increasingly difficult to assess his view of the areal relationships between the northern and southern Cascades, the northern Great Basin, and the various parts of the Plateau, areas which may have been occupied by the Old Cordilleran Culture.

In the absence of large amounts of hard primary data and detailed hypotheses, arguments for and against the Old Cordilleran Culture concept have tended to revolve around each particular individual's personal ideas about which specific archaeological occurrences are considered as representative of the Old Cordilleran Culture and the applicability of the word 'culture', to archaeological data (e.g., Daugherty 1962:148-49; Butler 1962a:7-9). Although these arguments are interesting in the context of developing a meaningful research framework for archaeology, they
have been far too general in scope to provide a meaningful review of the phenomena to which the caption "Old Cordilleran Culture" actually refers. Therefore, let us begin with a review of the regional sequences for areas in which the Old Cordilleran Culture is said to occur.

Regional Evidence. There are four major Anathermal-early-Altithermal archaeological sequences in the southern Columbia Plateau. The one which Butler relies most heavily upon has been constructed around the Five Mile Rapids site at The Dalles, Oregon. As Butler notes (1961:24), the typological descriptions presented in the published report of the Five Mile Rapids site (Cressman 1960) are so general that it is impossible to make adequate comparisons, even with other assemblages in The Dalles locale. However, on the basis of personal knowledge, Butler has equated the earliest portion of the sequence at Five Mile Rapids with the earliest component at Indian Well. Since this equation forms the only basis for hard information on the age and many of the characteristics of the Old Cordilleran Culture in The Dalles locale, it is central to any evaluation of the Old Cordilleran Culture. David L. Cole (1964: personal communication) and others who have personally worked with the collections from Five Mile Rapids and other early sites on the Middle Columbia insist that Cascade projectile points, possibly the most important single criterion for identifying the Old Cordilleran Culture, only occur during the Altithermal. These conflicts will never be completely resolved until the assemblages from The Dalles locale have been properly documented and re-evaluated.

From conversations with individuals who have worked with the collections and from the published report (Cressman 1960), I would provisionally reconstruct the early part of the sequence at Five Mile Rapids as follows. The earliest component (ca. 10,000-8000 B.P.) is characterized by a variety of leaf-shaped and unstemmed lanceolate projectile points and knives; there is also one stemmed lanceolate projectile point resembling the specimens from Lind Coulee. The leaf-shaped specimens are broad and short with wide, shallow flake scars and little or no retouching; they are not Cascade points. In addition, edge-ground cobbles, girdled bolas, and antler splitting wedges are also present. Later components contain a wide variety of stemmed lanceolate, lanceolate, and leaf-shaped projectile points some of which may be Cascade points.

The three remaining early sequences occur along the Lower Snake River, at Windust Caves (H. S. Rice 1965), Marmes Rockshelter (Fryxell and Daugherty 1962; Fryxell 1963), and at Thorn Thicket (Sprague 1966). They reveal the following sequence.

1. The earliest components, which appear to be roughly coextensive with the Anathermal (ca. 10,000-8000 B.P.), and which include the Lind Coulee site (Daugherty 1956a), are heavily dominated by a wide variety of stemmed-lanceolate projectile points in association with smaller numbers of unstemmed lanceolate and leaf-shaped projectile points (Rice 1965: Figs. 11-13, 17; Fryxell and Daugherty 1962: Fig. 6; Daugherty 1956: Figs. 18-20). Flake tools are made almost completely of cryptocrystalline silica; the use of basalt is uncommon, and specimens of obsidian and quartz crystal are very rare. Information from Lind Coulee and Thorn Thicket (Daugherty and Sprague 1966: personal communication) suggests that many flake tools were manufactured on large flakes and blades detached from exceedingly low angle, conical or biconical cores with faceted and frequently edge-ground striking platforms. These flakes are typically triangular or diamond-shaped in outline, with a narrow striking platform remnant in relationship to overall body width. Both unifacial and bifacial cobble implements occur in varying quantities, and edge-ground cobbles are present at some sites.

2. The second period roughly corresponds to the first half of the Altithermal (ca. 8000-6500 B.P.), and is represented both in the major sequences and at sites which possess no Ana-thermal component, including Indian Well (Butler 1959; 1961), Hat Creek (Shiner 1953; 1961), Ash Cave (Butler 1958b; 1962a), and Weis Rockshelter (Butler 1962a). These assemblages are dominated by leaf-shaped projectile points including those most frequently referred to as Cascade Projectile points, but small numbers of stemmed- and unstemmed-lanceolate projectile points also occur. Cryptocrystalline silica is still the dominant material, but the use of basalt is more common and may dominate at some sites; though still rare, obsidian is far more abundant. Many flake tools are manufactured on blades struck from conical or biconical cores with faceted and frequently edge-ground striking platforms (C. M. Nelson 1965a; 1966; Butler 1959:13). These blades tend to be parallel sided or slightly diamond-shaped in outline. Unlike the specimens manufactured during the preceding period, they are frequently (and sometimes dominantly) of basalt, possess a less acute angle at the striking platform, are much smaller, and have physically larger striking platform remnants which more closely approximate body width. Predominantly unifacially flaked cobbles implement occur at all sites, and edge ground cobbles are common at some sites (e.g., Bryan et al., 1963: Goldendale; Butler 1962a: Weis Rockshelter) and absent or very rare at others (e.g., Marmes Rock-shelter, Daugherty 1965: personal communication).

3. The latter part of the Altithermal (ca. 6500-4000 B.P.) is characterized by the Cold Springs Phase along the Lower Snake River and the upper part of the Middle Columbia River. This phase is represented at Cold Springs (Osborne and Shiner 1949; Shiner 1961), Three Springs Bar (Daugherty 1965: personal communication), Marmes
tools. Personal knowledge of the flaking detritus suggests that a faceted platform technique somewhat different than Borden (1957; 1961; 1962). Here components with C-14 dates ranging from 7500 to 9000 radiocarbon years B.P. have yielded large leaf-shaped projectile points and knives which are typologically similar to the leaf-shaped points. These are associated with ground slate knives, ground chisels, and a variety of flake components contain contracting stemmed projectile points similar to the Rabbit Island Stemmed and long, narrow implements; edge-ground cobbles do not occur, and the faceted platform technique has not been reported. Many flake tools are still manufactured from blades struck from conical or biconical cores with faceted and sometimes edge-ground striking platforms. In contrast to the preceding period, the blades are slightly smaller and less frequently edge-ground. Although usually absent, edge-ground cobbles are found at some sites (e.g., Thorn Thicket, Roderick Sprague 1966: personal communication). Predominantly unifacially flaked cobbly implements are common at all sites, and manos, grinding slabs, and pestles occur at some sites (Butler 1962a; Nelson 1966; Daugherty 1965: personal communication).

4. In the succeeding period on the Lower Snake River (ca. 4000-2000 B.P.), the large side-notched and leaf-shaped projectile points are replaced by a wide variety of corner-notched, corner-removed, contracting-stemmed, and rectangular-stemmed projectile points. In the extreme southeast corner of the Columbia Plateau, large side-notched projectile points persist in small quantities (e.g., C. M. Nelson 1966), and leaf-shaped points and knives occur as a minor part of the assemblage everywhere in the Plateau. These leaf-shaped specimens are typologically quite different from earlier types. The use of the faceted platform technique appears to be absent or very rare along the Lower Snake River, but continues to persist along the Upper Columbia River.

In the northwestern Columbia Plateau, along the Upper Columbia River, the only major early sequence occurs at Sunset Creek. Using comparative data the following periods can be defined.

1. The earliest period, the Vantage Phase, is characterized by large and small leaf-shaped projectile points and knives typologically most similar to specimens from the early assemblages in the Fraser River valley and along the Puget Sound littoral. Flake tools are frequently made on flakes and blades similar to those from Lind Coulee and Thorn Thicket; they are only smaller in size and less frequently occur with edge-ground striking platforms. Cobble implements do not occur in the selectively sorted sediments of 45KT28, but the flaking detritus and comparative data suggest that they were probably present during the Vantage Phase. Edge-ground cobbles are probably also present (Swanson 1962a).

The relationship between the Vantage Phase and the early phases along the Lower Snake River is not yet completely clear. The most likely reconstruction would place it successive to Lind Coulee and other late Wisconsin or Anathermal sites, and contemporary with the early Alithermal sites in the southern Columbia Plateau.

2. The second clearly represented period is the Cold Springs Phase (ca. 4500-3800 B.P.). it is represented at 45YK5 and Meyer Caves (Bryan 1955), and its presence is indicated by a transitional component at Sunset Creek (Cultural Component III). It is coeval with the terminal portion of the Cold Springs Phase in the southern Columbia Plateau and is characterized by a set of similar traits, including finely made leaf-shaped and large side-notched projectile points.

3. The Cold Springs Phase is succeeded by the Rabbit Island Phase which is represented at such sites as Sunset Creek and Schaake Village (Swanson 1962a; 1962b). It is characterized by rectangular-stemmed projectile points in association with a variety of leaf-shaped points and knives similar to those from post-Cold Springs components in the southern Columbia Plateau. Unifacially flaked cobbly implements are rare or absent, but there is some evidence to suggest that implements similar to edge-ground cobbles still persist (Appendix A: Edge-Ground Basalt Spall, Daugherty 1952:382).

In the western Cascade Mountains, the sole reliable sequence comes from the Fraser River valley at DjRi3 (Borden 1957; 1961; 1962). Here components with C-14 dates ranging from 7500 to 9000 radiocarbon years B.P. have yielded large leaf-shaped projectile points and knives which are typologically similar to the leaf-shaped specimens from the Vantage Phase. These are associated with flake scrapers and unifacially flaked cobbly implements; edge-ground cobbles do not occur, and the faceted platform technique has not been reported.

The early components at DjRi3 are followed by a hiatus between ca. 7500 and 4000 B.P. Succeeding components contain contracting stemmed projectile points similar to the Rabbit Island Stemmed and long, narrow leaf-shaped projectile points. These are associated with ground slate knives, ground chisels, and a variety of flake tools. Personal knowledge of the flaking detritus suggests that a faceted platform technique somewhat different than
those used in the Columbia Plateau may be in use.

Further to the south, along the Puget Sound littoral, the oldest known assemblages are not yet dated. They are broadly similar to the early materials from DJRi3, being characterized by a variety of leaf-shaped projectile points, flake scrapers, and unifacially flaked cobble tools (Butler 1961; Thomson 1961). The leaf-shaped projectile points vary greatly in size and include some small specimens with serrated edges. Edge ground cobbles do not occur and there is no reported occurrence of blades with faceted striking platform remnants.

After a hiatus of unknown duration, the earliest known foothills components contain radically different assemblages. The earliest assemblage, from the Marymoor Site (Greengo 1965), contains side-notched projectile points similar to those from the Cold Springs Phase in the Columbia Plateau and leaf-shaped projectile points very similar to Cascade points. Of 25 illustrated leaf-shaped projectile points, none are serrated and possess easily identifiable bases. As a group they tend to be slightly larger than Cascade points from the Plateau and range from 3.48 to 6.70 cm. in length; average, 4.75 cm. They are also wider than Cascade points, ranging from 1.46 to 2.18 cm. in width; average 1.92 cm. Thickness ranges from 0.64 to 0.89 cm., and averages 0.72 cm. Length/width indices tend to be lower than those of true Cascade points, ranging from 1.81 to 3.25; average 2.47. These ranges overlap with those for true Cascade projectile points and open the possibility of expanding the type definition. Unfortunately, there is no information on base edge-retouching or on the possible association of blades with faceted striking platforms. In his commentary, Greengo (1966: 12) mentions that some of the specimens have striking platform remnants intact at their bases, a fact which suggests they may have been based on blades of some type. If these leaf-shaped and side-notched projectile points are related to their counterparts in the Columbia Plateau, it is probable that there was diffusion from the Plateau to the western Cascades during the Cold Springs Phase.

The Marymoor points are associated with a wide variety of other flake tools, including stemmed and corner-notched projectile points, and microblades. C-14 dates indicate that the site may have been occupied between ca. 3000 and 1500 B.P., but the association of these dates and the side-notched and leaf-shaped projectile points is not yet completely clear (Greengo 1966).

The second major assemblage, from the Duval site (C. M. Nelson 1962b), is characterized by large corner-notched projectile points in association with lesser numbers of stemmed and triangular projectile points; a few leaf-shaped knives also occur, but they do not have any of the characteristics of Cascade points. Associated tools include unifacially flaked cobble implements, adzes, gravers, scrapers, drills, microblades, and side scrapers based on large blades. Where platform remnants are left intact on the large blade tools, they are unfaceted; large, unworked blades have not yet been recovered. Among the flakes and flake tools there are a few specimens with faceted striking platform remnants, but none are true blades and none display edge-ground striking platforms (author's note). However, two of the microblades, both quartz crystal, do have finely faceted striking platforms (author's note 1966: specimens 799 and 801). These platforms are not edge-ground. [17/18]

Typological comparisons suggest that the Duval assemblage is more recent than the bulk of the assemblage from the Marymoor site.

The earliest marine components, from Rosario Beach (Bryan 1963) and Comet Bay (Bryan 1963; C. M. Nelson 1962a), also contain a variety of leaf-shaped projectile points which are found in association with triangular and rectangular-stemmed projectile points, barbed and unbarbed bone points, composite harpoons, adzes, wedges, and abrasive stones. Unifacially flaked cobble tools occur, but are rare. Edge-ground cobbles and the faceted platform technique are absent. These components are believed to date from ca. 1500 to 3500 B.P.

This is what we generally know of the early sequences from the Columbia Plateau and the Cascade cordillera, and it is based on these facts that the Old Cordilleran Culture must be evaluated. But what is the Old Cordilleran Culture? Recently Butler (1965: 1127) reviewed the content of the Old Cordilleran Culture concept and enumerated the following tangibles which are said to be characteristic of the Old Cordilleran Culture: (1) the Cascade projectile point, (2) a variety of oval knives, (3) generally nondistinctive cutting, chopping, and scraping implements, (4) blade tools, such as end-of-blade scrapers, (5) unifacially beveled antler wedges, (6) other unspecified tools of bone and antler, (7) the edge-ground cobble complex, (8) hunting of modern species of artiodactyla, including deer, elk, antelope, and sheep, (9) snaring or trapping of birds, (10) use of root crops such as camas and kouse, (11) fishing, and (12) use of fresh water mussels and snails. Since these are the characteristics of the Old Cordilleran Culture, we can reasonably expect them all to be found associated with one another in each of the major geographic areas in which the Old Cordilleran Culture is said to exist. These areas include the western Cascade Mountains, the southern Columbia Plateau, and the adjacent portion of Idaho (Butler 1965:1126-27). In 1961, Butler strongly inferred that portions of the northern Great Basin might also be characterized by the Old Cordilleran Culture. However, since he
does no mention this area in subsequent publications, it is by no means clear what relationship it bears to the Old Cordilleran Culture concept. Let us now review the distribution of the 12 traits listed above to see if they are found in association with one another in the areas in which the Old Cordilleran Culture is supposed to have existed. We will begin with the Cascade projectile point since it is considered the single most important characteristic of the Old Cordilleran Culture (see Butler 1961; 1962a:8).

*Definition of the Cascade Projectile Point Type.* But what is the Cascade projectile point? In 1961 Butler stated (28-29):

> When I first examined these points, they reminded me of the Lerma type illustrated in the *Handbook of Texas Archaeology* as well as the Type 11A points in the Upper Klamath Lake Region. Early in 1958 photographs of 58 of the Indian Well I specimens were sent to Krieger for identification as possible Lerma Points. Krieger recommended sending the material to MacNeish, who had originally established the type. MacNeish wrote in reply that all but the serrated specimens were "A-1" Lerma points, and he noted that points of this type were found at scattered locations along the cordilleras of the New World..... Because of the problems inherent in our limited knowledge of the distribution of these forms, Krieger has suggested that the Pacific Northwest specimens be given a separate type designation. Hereafter, these will be referred to as *Cascade* points. In addition to the specimens from Indian Well I, the Cascade type includes the Type 11A points from Kawumkan Springs, the leaf-shaped points from Fort Rock and Cougar Mountain Caves, and similar specimens from the Five-Mile Rapids site.

Butler (1961; 1962a) subsequently included the leaf-shaped projectile points from Hat Creek, Ash Cave, Cold Springs, Lind Coulee, Haller Lake, the Ockett site, DjiRi3, and Weis Rock-shelter in the newly proposed Cascade projectile point type. The type assemblage for all these [18/19] specimens is Indian Well I (Butler 1961; 1962a:36), so the fundamental question is: Are all of the projectile points which have been called Cascade points similar enough to be considered typologically identical?

A close inspection of the comparative data from the southern Columbia Plateau discloses that the assemblage from Indian Well I is beyond doubt typologically identical with the early Altithermal assemblages from Hat Creek (Shiner 1953; 1961), Ash Cave (Butler 1958b; 1961; 1962a), Windust Caves (H. S. Rice 1965), Marmes Rockshelter (Daugherty 1965: personal communication), Thorn Thicket (C. M. Nelson 1963; Roderick Sprague 1966: personal communication), and Weis Rockshelter (Butler 1962a). Each of these assemblages contains projectile points with the following characteristics. (1) They are leaf-shaped in outline and possess easily definable, retouched basal areas. (2) They are finely pressure flaked. (3) They are manufactured from blades with faceted and frequently edge-round striking platforms (Butler 1959:13; C. M. Nelson 1965a: Fig. 1). These blades tend to be parallel sided or roughly diamond-shaped in outline, and have wide platform remnants in relation to overall blade width. (4) Many are finely serrated. (5) The widest part of the point may occur at the junction of the body and the base, or anywhere within the lower one-third of the body. (6) The transverse cross section commonly varies from lenticular to rhomboidal, but plano-convex examples occasionally occur. (7) The longitudinal cross section is usually lenticular, though plano-convex specimens also occur. (8) Length most commonly ranges from 3.0 to 5.5 cm., but specimens as small as 2.5 cm. and as large as 6.7 cm. occasionally occur. (9) Width commonly ranges from 1.1 to 1.8 cm., but specimens as narrow as 0.9 cm. and as wide as 2.2 cm. are known to occur. (10) Thickness commonly ranges from 0.4 to 0.8 cm., but specimens as thin as 0.3 cm. and as thick as 0.9 cm. also occur; the average thickness falls between 0.5 and 0.6 cm. (11) Length/width indices commonly range from 2.4 to 4.0, although specimens occasionally have length/width indices as low as 2.2 and as high as 4.4.

Using even the rudimentary definition outlined above, it is obvious that the Cascade projectile point type embraces a highly distinctive set of morphological characteristics and technological practices. It is in no way a catch-all category for "non-diagnostic" leaf-shaped knives and projectile points or a term which should be applied indiscriminately to ancient assemblages dominated by leaf-shaped forms. With this in mind, let us consider those leaf-shaped projectile points to which the type name has been applied.

*Distribution of Cascade Projectile Points.* Besides the early Altithermal components which are unquestionably dominated by true Cascade points, Butler mentions three other definite occurrences in the Columbia Plateau: (1) a single projectile point from Lind Coulee (Daugherty 1956a), (2) the early leaf-shaped points from the Five Mile Rapids site (Cressman 1960), and (3) the leaf-shaped projectile points from Cold Springs (Shiner 1961). The specimens from Cold Springs as well as other Cold Springs Phase components, including those at Windust Caves, Three Springs Bar, 45C01, Marmes Rockshelter, and Weis Rockshelter, possess all of the characteristics of the Cascade type.
The possible Cascade point from Lind Coulee (Daugherty 1956a: Fig. 20, 3) is a fragmentary specimen which might be the stem of a large stemmed-lanceolate point or the base of a leaf-shaped projectile point. It is slightly edge-ground and possesses broad, shallow flake scars, traits which are not characteristic of Cascade points. Moreover, it possesses no definable retouched base and is not serrated. Like the other projectile points from Lind Coulee, it probably was manufactured from a blade with a faceted and possibly edge-ground striking platform remnant. But unlike the small blades associated with known Cascade components, this blade would have been large, diamond or triangular shaped, with a physically small striking platform remnant in relation to blade width. Conclusion: this specimen is not a Cascade projectile point. [19/20]

It is impossible to tell from the published data what the distribution of Cascade projectile points is in the Five Mile Rapids site at The Dalles. Butler cited Cascade points in the earliest component, but David L. Cole (1964: personal communication) maintains that they occur much later in the sequence. The earliest component is dominated by lanceolate and leaf-shaped projectile points which are short and broad with wide, shallow flake scars and little or no retouching. Such projectile points do not fall within the range of variation of Cascade points.

There is also a large Anathermal assemblage of stemmed-lanceolate, lanceolate, and leaf-shaped projectile points from Windust Caves (H. S. Rice 1965). One of the illustrated specimens from this assemblage (Fig. 13, d) appears to be serrated and may be a Cascade point. The Windust assemblage should be reexamined in order to determine if Cascade points are present in association with the lanceolate projectile points in the earliest components.

Butler cites the leaf-shaped projectile points from Kawumkan Springs (Cressman 1956), Fort Rock Cave (Cressman et al., 1940; Cressman 1942), and Cougar Mountain Cave (Cowles 1959), as evidence for the presence of Cascade projectile points in the northern Great Basin. The specimens from the Kawumkan Springs site vary tremendously in size and morphological form, but they do not include any which fully satisfy the definition of the Cascade point type (see Cressman 1956: Fig. 45). Moreover, there is no evidence to suggest that they are associated with the faceted platform technique. The specimens from Cougar Mountain Cave (Cowles 1959: Pl. 1) do not have readily identifiable bases and they are not serrated. The flaking is observably different from that of Cascade points and there is no report that the specimens were manufactured on blades with faceted striking platforms. Moreover, the Cougar Mountain points range from 7.6 to 13.9 cm. in length, measurements well above the range for known Cascade assemblages.

Butler (1962a:8-9) states that 44 leaf-shaped projectile points were recovered from beneath the volcanic ash at Fort Rock Cave. These specimens are described as carefully made, doubly pointed, thick, frequently serrated, between 3.8 and 8.9 cm. long and between 1.3 and 2.3 cm. wide. For his description of Fort Rock Cave, Butler cites Cressman, Williams, and Krieger (1940) and Cressman (1942). A search of these and other works (Cressman 1939; 1940a; 1940b; 1947) reveals no adequate illustrations or descriptions of these 44 specimens, so it is not possible to ascertain if any true Cascade points are present. However, there is no report of the faceted platform technique; several flake tools are illustrated which have unfaceted platforms.

Conclusion: Cascade points do not occur at the Kawumkan Springs site or Cougar Mountain Cave and their presence is doubtful at Fort Rock Cave. The presence of Cascade points in the northern Great Basin cannot be demonstrated.

Along the western Cascade Mountains, Butler cites the early material from DjRi3 and the Olcott site as evidence for the early occurrence of Cascade points along the Cascade cordillera. The specimens from DjRi3 (Borden 1961: Pl. 2), Zones E, G, and I, possess none of the characteristics of Cascade projectile points. They tend to be larger and wider; they probably are percussion flaked; they are not serrated; they do not possess the Cascade type of point base; and there is no reported evidence which suggests that they were manufactured on blades or are associated with a faceted platform technique. Conclusion: the specimens from DjRi3 are not Cascade points.

Assemblages from the Olcott and associated sites (see Thomson 1961) are dominated by projectile points very similar to those from DjRi3. However, small numbers of serrated specimens also occur which are similar in outline and size to true Cascade points. Unfortunately, there is no information of technique of manufacture or the occurrence of the faceted platform technique. [21]

In addition, Cascade-like projectile points occur in a later assemblage from the Marymoor site (Greengo 1966: Fig. 6) where they are associated with side-notched projectile points very similar to the Cold Springs Side-Notched type. It is not known if these leaf-shaped points satisfy the technological associations definitive of true Cascade points, but it is quite possible that they do. In any case, the Marymoor assemblage strongly suggests diffusion from the Plateau to the western Cascades between 5000 and 3000 B.P.
Conclusion: small numbers of possible Cascade points are found at some sites in the Western Cascade Mountains, but further work is needed to plainly demonstrate the presence or absence of the type.

In summation, Cascade projectile points are known to occur only in the southern Columbia Plateau and the adjacent portion of Idaho during the Altithermal. Unconfirmed or dubious reports exist for some Anathermal components in the Southern Columbia Plateau and components of unknown age in the western Cascade Mountains of Washington. Reports of Cascade points from the northern Great Basin are completely unwarranted on the basis of our present knowledge.

The Age of Cascade Components. Up to the present, I have referred to Cascade-point-dominated components in the Southern Columbia Plateau as Altithermal in age. What is the basis for the assignment in age, particularly in light of the evidence adduced by Butler (1962a:77-80) which suggests that such components are much older in The Dalles locale? Butler dates the Cascade point-bearing components at The Dalles at ca. 8000 to 11000 B.P., the component at Ash Cave between 8000 and 9000 B.P., and the component at Weis Rockshelter at ca. 7500 to 3500 B.P., and uses these estimates to support the idea that the Old Cordilleran Culture spread "eastward across the Columbia Plateau in early post-glacial times" (1962a:80). Let us examine these age estimates.

The two major occurrences of Cascade projectile points in The Dalles locale are at Indian Well and Five Mile Rapids. There are no C-14 or geological age estimates for the component at Indian Well, so Butler's age estimate of ca. 8000 to 11000 B.P. hinges on his interpretation of the Five Mile Rapids sequence, for which he claims that Cascade points occur in the earliest component. Cole (1964: personal communication), however, states that Cascade points do not appear in the earliest component, which is dominated by leaf-shaped and lanceolate projectile points similar to those from Lind Coulee, Windust Caves, and Marmes Rockshelter. Since such projectile points do not occur at Indian Well I, the Cascade component at this site is certainly not comparable with the earliest assemblage from the Five Mile Rapids site, where very small numbers of Cascade points may or may not occur in the context of a different tool assemblage.

The age estimate of 8000 to 11000 B.P. is based on the earliest C-14 date from the Five Mile Rapids site. This date was obtained from a composite sample taken from Stratum I and is 9785 ± 220 radiocarbon years B.P. (Cressman 1960). Since it is a composite sample, Cressman believes that the bottom of Stratum I must date from 11000 to 11,500 B.P. (1960:66). There is no way of substantiating this opinion. Thus, an age estimate as early as 11,000 years is not only undemonstrable, it is applicable only to a pre-Cascade component and does not date the association of tools which identifies the Early Dalles Phase of the Old Cordilleran Culture.

Ash Cave has a single associated C-14 date of 7940 ± 150 radiocarbon years B.P. (Butler 1962a:71). The dated sample directly underlies volcanic ash believed to be from the eruption of Mount Masama about 6500 B.P. (cf. Fryxell 1965). Since the date comes from the top of the Cascade component, Butler believes that the bulk of the component antedates 8000 B.P. [22]

At Weis Rockshelter the lower part of the Cascade sequence is dated at 7340 ± 140 radiocarbon years B.P. It has led Butler to the belief that such components date from as early as 7500 B.P. in west-central Idaho. In fact, the date only provides information on the occupation of Weis Rockshelter; older Cascade components may exist elsewhere in the region.

Since 1962 a number of dates have become available from the Cascade component at Marmes Rockshelter. They underlie an identified deposit of Mount Mazama volcanic ash and range from 6200 to 8000 B.P. (Fryxell and Daugherty 1962; 1965: personal communication).

The available C-14 dates suggest that Cascade components first appear between 7500 and 8000 B.P., but there are not enough dated occurrences to demonstrate where they first appear or the direction(s) in which they spread. In the southern Columbia Plateau they persist until about 6500 B.P. and in adjacent Idaho the evidence suggests that they may have persisted until as late as about 3500 B.P. (Butler 1962a).

The Occurrence of Cascade Projectile Points in the Early Phases of the Southern Columbia Plateau. Although Butler treats The Dalles Cascade components as contemporaries with the stemmed-lanceolate dominated component at Lind Coulee (1961), there is now abundant evidence to show that these components represent two successive phases in the southern Columbia Plateau. The earlier phase, properly called the Lind Coulee Phase after its type site, is characterized by stemmed-lanceolate and lanceolate projectile points which frequently have ground edges. Lesser numbers of leaf-shaped projectile which may or may not include a few true Cascade points also occur. This phase is represented at Five Mile Rapids, Lind Coulee, Windust Caves, Marmes Rock-shelter, and Thorn Thicket, and corresponds roughly with the Anathermal (ca. 8000-11,000 B.P.). The second phase, properly called the Indian Well
in the Pacific Northwest, the distribution of specific types cannot be used either to support or refute the Old
hypothesis does not provide a model that can satisfy even the limited amount of data which is available. [23]
Butler (1962a: 8) replied by asking "what is the cultural significance of a projectile point tradition? Such a tradition would seem to indicate cultural continuity, historical relationships, and shared patterns of behavior. This definition can be extended to include an 'archaeological' culture…. An archaeological culture represents a temporal segment of a complex set of shared behavioral patterns expressed in an assemblage of cultural traits occurring in a geographic continuum."

Gruhn (1962) states that in actual fact there was "evidence only for the existence of a projectile point tradition, which was probably held in common by a number of distinctive cultural groups...” Butler (1962a:8) replied by asking "what is the cultural significance of a projectile point tradition? Such a tradition would seem to indicate cultural continuity, historical relationships, and shared patterns of behavior. This definition can be extended to include an 'archaeological' culture…. An archaeological culture represents a temporal segment of a complex set of shared behavioral patterns expressed in an assemblage of cultural traits occurring in a geographic continuum."

In fact, however, no projectile point tradition, which embraces shape, size, and method of manufacture, has been demonstrated outside of the southern Columbia Plateau. Even if such a tradition did exist, there is every indication there is no "complex set of shared behavioral patterns" in the large area to which Butler attributes the Old Cordilleran Culture simply because there is no complex set of cultural traits archaeologically present in that area.

At best, the only reasonable hypothesis which can be constructed is that the idea of making projectile points which had a leaf-shaped outline diffused through adjacent portions of the Great Basin, Columbia Plateau, and Cascade cordilleran at an early date. And that is the broader significance of the distribution of leaf-shaped projectile points in the Pacific Northwest.

**Oval Knives.** Butler briefly refers to oval knives in 1959 (13) and 1961 (90: Fig. 4, Ovate knives), and describes a series of "broad oval points" from Weis Rockshelter in the following terms:

This is a highly variable group comprising 41 complete and fragmentary examples. All are generally oval in outline and most are bifacially flaked. Some are well made and rather thin; others are crudely chipped and are often quite thick... The largest specimen... although bifacially flaked and elliptical in outline, may have been some sort of scraper rather than a knife. All of the specimens are made of silica minerals. Size range: 3.7-13.2 cms. in length; 2.0-6.1 cms. in width; and 0.6-2.3 cms. in thickness. Distribution: 14 in Substratum 5e; 15 in 5c; 8 in 5a; 4 in Stratum 3; and 1 in Stratum 1...

(Butler 1962a:38-39).

The internal variation in size, shape, cross section, and technique of manufacture which exists in this type render it of little use as a criterion for defining phases or archaeological cultures. As Butler indicates, oval knives are distributed throughout the sequence at Weis Rockshelter. They are distributed throughout the Plateau where they occur at every time level. They are also widely distributed in the western United States.

**Nondistinctive Cutting, Chopping, and Scraping Tools.** The tools which Butler refers to include a wide variety of unifacial and bifacial cobble and flake implements. Since tools of this general sort have an almost universal distribution at an early time level and are commonly associated with more recent hunting and gathering societies, they can hardly be considered diagnostic in themselves. Since there are no adequate descriptive studies of such implements in the Pacific Northwest, the distribution of specific types cannot be used either to support or refute the Old
Cordilleran Culture concept.

**Blade Tools.** Blade tools associated with Indian Well Phase components include Cascade projectile points, end scrapers, side scrapers, and utilized flakes. The blades, themselves, are large, tend to be roughly rectangular or slightly diamond-shaped in outline, and possess faceted and frequently edge-ground striking platform remnants (C. M. Nelson 1965a). [24]

These blades are known to occur in components of the Indian Well and Cold Springs phases in the southern Columbia Plateau. They do not occur in the sequence from 45KT28 and they have not been reported from other sites in the northwestern Columbia Plateau, the western Cascades, or the northern Great Basin. The fact that they are a part of a sequence of blade forms in the Columbia Plateau strongly suggests a local development rather than transmission from surrounding areas such as the Cascade cordillera.

**Unifacially Beveled Antler Wedges.** Butler bases this trait on specimens from Weis Rock-shelter and Five Mile Rapids, which include specimens of problematical use as well as true wedges. Some of the specimens from Five Mile Rapids (Cressman 1960) may be associated with the Lind Coulee Phase component there. Antler splitting wedges are also known from the Cold Springs Phase (e.g. C. M. Nelson 1966), as well as the Rabbit Island, Quilomene Bar, and Cayuse phases. Although bone and antler are not commonly preserved in the foothills sites of the western Cascade Mountains, antler splitting wedges in the earliest known coastal components suggest that they may have been important at an earlier period in the foothills. The only published evidence for antler splitting wedges in the northern Great Basin comes from sites in the Klamath area such as Kawumkan Springs (Cressman 1956). They do not occur at Fort Rock or Cougar Mountain caves.

Conclusion: although antler splitting wedges are wide spread in the Pacific Northwest at almost all time levels, they are absent in the more arid portions of the northern Great Basin and their existence cannot be conclusively demonstrated or refuted for the early period in the western Cascades due to the preservation problem.

**Edge-Ground Cobble Complex.** Edge-ground cobbles occur in the southern Columbia Plateau in association with Lind Coulee, Indian Well, and Cold Springs phase components such as those at Five Mile Rapids (Cressman 1960), Goldendale (Warren et al., 1963), Marines Rockshelter (Daugherty 1965: personal communication), 45C01 (C. M. Nelson 1966), Thorn Thicket (Sprague 1966: personal communication), and Weis Rockshelter (Butler 1962a). Edge-ground cobbles also occur on the Upper Columbia River at an early date (Swanson 1962a). However, there are no known occurrences in the western Cascade Mountains or in the northern Great Basin.

The edge-ground cobble complex of which Butler (1962a:44-46; 1963; 1965) speaks consists of the association of edge-ground cobbles with circular, well rounded river cobbles which have slightly convex, highly polished faces. This association occurs at Weis Rockshelter, the only site at which the cobble bases are known to occur. However, since the bases are easily mistaken for unaltered cobbles, it is possible that they have been overlooked at many other sites.

**Use of Root Crops.** Butler's comment that roots such as kouse and camas were an important part of the subsistence pattern is based on the equation of the edge-ground cobble complex with the grinding of soft food crops. The following facts are pertinent to this hypothesis. (1) The association of edge-ground cobbles with polished cobbles is known from only one site. In order to establish a functional relationship between these tools it will be necessary to establish their archaeological relationship at many more sites. (2) Butler notes that the distribution of edge-ground cobbles is limited to areas in which camas and kouse are present and to sites which could have been used as camas or kouse gathering bases. Almost every site which exists within the geographic area from which edge-ground cobbles are known is sufficiently close to camas and kouse producing areas to qualify as a possible root gathering station. Moreover, there are areas, in which camas and kouse occur and were ethnographically utilized where edge-ground cobbles do not occur, including the Puget Sound littoral and the Fraser River valley. (3) The highly polished, nearly flat facets which occur on edge-ground cobbles and the highly polished, convex surfaces of the possible cobbles are functionally poorly suited to the preparation of roots which are easily pulverized but ground only with difficulty. [25]

The function of edge-ground cobbles and the use of root crops during the Indian Well Phase cannot be demonstrated with the existing evidence.

**Hunting of Modern Artiodactyla.** The hunting of animals such as deer and elk was undertaken by hunters and gatherers and formative horticulturalists wherever such animals occurred. In itself, this trait cannot be considered distinctive of any phase, period, or archaeological culture in the Plateau.
Snaring or Trapping of Birds. Butler bases this characteristic primarily on the occurrence of bird bones and girdled "bolas" from the Five Mile Rapids site (Cressman 1960). Since the presence of an Indian Well Phase component is in question at this site, the extension of bird trapping from it to the Old Cordilleran Culture is a very doubtful procedure. Moreover, there is no evidence for extensive bird trapping at any other Indian Well Phase component, though occasional bird bones do occur. It is also uncertain that the birds represented in the fauna from Five Mile Rapids were trapped instead of hunted since the associated girdled pebbles might have been weights for fishing nets or atlatls.

As bone is not preserved in the acid soils of the western Cascades, there is no faunal evidence to substantiate or refute bird hunting at DjRi3 or the Olcott assemblage sites, but girdled "bolas" do not occur. Bird bones are relatively common in Great Basin assemblages, but girdled "bolas" are not found.

Fishing. Like the trapping of birds, Butler relies heavily on the Five Mile Rapids sequence to demonstrate the importance of fishing in the Old Cordilleran Culture. Since Butler's basic interpretation of the sequence is questionable, the importance of fishing in the Old Cordilleran Culture is an open question.

Elsewhere, at Indian Well Phase components, fish bones are absent or uncommon.

Utilization of Fresh Water Mussels. The remains of fresh water mussels occur throughout the Columbia Plateau during every period of prehistory. Poor preservation makes it impossible to know whether they were in use at an early time period in the western Cascades. Cressman (1956:387) reports that they were commonly used in the Klamath area but are rare in the Great Basin proper.

Conclusion. Of the twelve activities and items of material culture considered characteristic of the Old Cordilleran Culture (Butler 1965:1127), the snaring or trapping of birds, the use of roots such as kouse and camas, the edge-ground cobble complex, and the association of the edge-ground cobble complex or of edge-ground cobbles with food grinding are conjectural, speculative traits which cannot be demonstrated for any early phase or component in the Pacific Northwest, including the Lind Coulee and Indian Well phases in the southern Columbia Plateau. The first clear evidence which can be used to support the utilization of root crops is the introduction of mortars and pestles during the Cold Springs Phase.

Oval knives, nondistinctive cutting, chopping, and scraping tools, unspecified tools of bone and antler, and the utilization of modern artiodactyla, birds, fish, and fresh water mussel shells are characteristics so general that they apply to virtually all phases of prehistory in Columbia Plateau and adjacent areas. Although important for reconstructing economic organization, they cannot be used to define archaeological cultures or phases on the simple basis of presence or absence.

This leaves Cascade projectile points, a specific type of blade with a faceted platform, and edge-ground cobbles, three items of material culture whose association can be traced in time and space. And these traits occur together only in the southern Columbia Plateau and the adjacent portion of Idaho in the Indian Well and Cold Springs phases. However, the Cold Springs Phase is also noted for Cold Springs or Bitterroot Side-Notched projectile points, manos, grinding slabs, hopper mortars, and pestles, items which do not occur in Indian Well Phase components and are not said to be characteristic of the Old Cordilleran Culture. Therefore, if the Old Cordilleran Culture corresponds to any set of hard data which actually exists in reality, it is the assemblages and components of the Indian Well Phase. It follows that the Old Cordilleran Culture concept can be used as a hypothetical model to explain the Indian Well Phase and to propose meaningful research which will help to clarify the meaning of the Indian Well Phase. Obviously, such research should be conducted in the eastern and western foothills of the Cascade Mountains adjacent to the southern Columbia Plateau. If work in these areas reveals Indian Well Phase components which are demonstrably older than their counterparts in the Columbia Plateau, there will be important evidence to support the Old Cordilleran Culture concept as it applied to the Indian Well Phase.

Since the archaeological content of the Old Cordilleran Culture does not correspond to any set of archaeological data in the Northwest except the Indian Well Phase components, it cannot be used as an explanation or model for the prehistory of the northern Cascades, the northern Great Basin, or the northern Columbia Plateau.

Alternative Hypothesis. The Indian Well Phase may be explained in terms of an internal development within the southern Columbia Plateau. With the exception of the Cascade projectile point and the associated blades with faceted striking platforms, archaeological sequences at Five Mile Rapids, Windust Caves, Marmes Rockshelter, and Thorn Thicket demonstrate that the characteristics of the Indian Well Phase were present in the southern Columbia Plateau prior to its emergence. Also a variety of leaf-shaped points was present out of which Cascade projectile points could have developed. The blades from which Cascade projectile points were made also have antecedents in the
blades and flakes of the Lind Coulee Phase. In addition, lanceolate projectile point types characteristic of the Lind Coulee Phase survive in small quantities.

The continuity in the Anathermal-early-Altithermal archaeological sequence in the southern Columbia Plateau strongly suggests an internal development, an hypothesis which would be supported by work in areas adjacent to the southern Columbia Plateau which revealed no Indian Well Phase components or the presence of such components at a more recent date.

Addenda. Newman (1966) reports the existence of an Indian Well Phase component on the western slopes of the Cascade Mountains in the Willamette Valley of Oregon. A date of 7910 ± 280 radiocarbon years B.P. is associated with the earliest occupation of the site and indicates that the Indian Well Phase was well established west of the Cascades at a time comparable to its expression in the southern Columbia Plateau. As the date is neither older nor younger than comparable dates from the Columbia Plateau, neither hypothesis reviewed above is confirmed.

The Cold Springs Phase

Introduction. This phase takes its name from Cold Springs (35UM7), a site located on the south bank of the Columbia River approximately 13 miles downstream from the mouth of the Walla Walla River (Shiner 1961:179-91). No phase designation was applied to the early component at this site until Butler (1961:30-36) used the term Cold Springs Horizon to designate components, like that at Cold Springs, which were about 4000 to 6500 years old and characterized by large side-notched projectile points in association with Cascade projectile points. Recent work at Three Springs Bar (Daugherty 1965: personal communication), Windust Caves (H. S. Rice 1965), Marmes Rockshelter (Fryxell and Daugherty 1962), 45C01 (C. M. Nelson 1966), Thorn Thicket (Roderick Sprague 1966: personal communication), and Weis Rockshelter (Butler 1962a), indicates that this horizon is a widespread phenomenon deserving of the phase designation.

Although no Cold Springs Phase component was encountered at the Sunset Creek site, its presence at the Sourdough Creek site (45YK5; Greengo 1963: personal communication) and at Meyer's Caves (Bryan 1955) indicates that it is an important part of the Vantage sequence. Moreover, Cultural Component III (see below) contains some traits which document the influence of this phase in Vantage locale.

Definition of the Cold Springs Phase. The Cold Springs Phase is most easily defined by the presence of Cold-Springs Side-Notched projectile points (Butler 1962a: Fig. 9, ss; Shiner 1961: Pl. 35b; H. S. Rice 1965: Fig. 10, b, d; C. M. Nelson 1966: Fig. 9), also known as the Bitterroot Side-Notched projectile point in parts of the southern Columbia Plateau and Idaho. Cascade, other leaf-shaped, and unstemmed lanceolate projectile points are also found in small numbers in most Cold Springs components. Evidence from 45C01 suggests that the faceted platform technique is retained and that some artifacts are manufactured on blades with faceted striking platforms (C. M. Nelson 1966). Other characteristic features include manos, conical pestles, grinding stones or mortars, atlatl weights like the Type II specimens of Butler and Osborne (1959: Fig. 1, g, i), and cairn burials placed in rockshelters. Antler wedges and projectile points, eyed bone needles and metapodial awls, Olivella beads, shaft smoothers, burins, and a wide variety of flake tools are also present. Unifacially flaked cobble tools are very common. Basalt is more frequently used in the manufacture of flake tools than during any other period of Plateau prehistory, and obsidian becomes common for the first time.

In the southern Columbia Plateau, Cold Springs components are frequently found immediately overlying deposits of volcanic ash attributed to the eruption of Mount Mazama approximately 6,500 years ago (cf. Pryxell 1965). Although this provides a limiting date on the appearance of the Cold Springs Phase, there are as yet no firm dates on its termination. Rough geological estimates and a single C-14 date from the Vantage locale in the northwest Columbia Plateau suggest a terminal date of ca. 4000 B.P.

In the Vantage locale there is a C-14 date of ca. 4200 B.P. from the Sourdough Creek site (Greengo 1963: personal communication). Since Cold Springs components are very rare along the Upper Columbia River and extremely common along the upper part of the Middle Columbia and Lower Snake rivers, it is probable that the phase spread northward through the Columbia Plateau and is more recent in the Vantage locale than in the southern Columbia Plateau.

Origin of the Cold Springs Phase. The Cold Springs Phase is important in interpreting Plateau prehistory because it marks the introduction of the basic food grinding complex which is characteristic of the Great Basin. Manos, conical pestles, and food-grinding stones first appear in Cold Springs components and are accompanied by other traits such as large side-notched projectile points which also probably originated in the Great Basin and spread northward into the Columbia Plateau. The probable northward spread of the phase within the Plateau further supports
this interpretation.

Since the Cold Springs Phase is a mid-Altithermal phenomenon, it is possible that it represents an out
migration from the northern Great Basin into the southern Columbia Plateau. It is also possible, however, that under
the stress of the Altithermal climatic episode, Great Basin forms of adaptation diffused northward into the Plateau.
The retention of Cascade projectile points and the faceted platform technique may be interpreted to support this
view. In any event, the Great Basin flavor of Plateau prehistory about 6500 and 4000 B.P. almost certainly
derives from Great Basin influences during the Cold Springs Phase. The routes along which this influence might
have traveled are still unknown, pending much more detailed work in the northern Great Basin and the southern
Columbia Plateau.

Until larger samples are analyzed and their contents shown to be generally distributed among Cold Springs
Phase components, the definition of the phase as an historically significant entity must necessarily rest with the large
side-notched points. A few other characteristic traits may also be tentatively suggested. These are based principally on
the preliminary analysis of cultural materials from Mamies Rockshelter (Fryxell and Daugherty 1962), and include the
dominant use of basalt in the manufacture of chipped stone artifacts, flexed cairn burials, and long slender atlatl
weights.

The Frenchman Springs Phase

The Frenchman Springs Phase designation is reapplied from Swanson (1962a:39), who has subdivided it into
three subphases. Since they are based largely on perishables, pit houses, and other site features not duplicated at
45KT28, no attempt will be made to make a detailed correlation between these subphases and the three Frenchman
Springs components reported here. The phase as a whole may be easily correlated on the basis of projectile point
types, particularly on the basis of what Swanson terms rectangular stemmed points and which I prefer to call Rabbit
Island Stemmed points (Swanson 1962a; 1962b Beds D1 and B3).

CULTURAL COMPONENT III

Cultural Component III was first located beneath House Pit 7 (Figs. 4 and 23), about seven feet below the
surface of the ground. Subsequently it was located along the beach in the area of House Pits 8, 12, and 13 (Fig. 4),
where it was overlain by several components belonging to the Quilomene Bar Phase. Several test pits were then
excavated in the region of House Pit 13 (Fig. 4), where seven culture-bearing strata were encountered (Fig. 10). The
next to the earliest of these was Cultural Component III.

Stratigraphy. Cultural Component III resides on a windblown surface which marks the junction between
Stratum 3 and Stratum 4. Since it may be argued that cultural debris could have been accumulating on this surface for
a long period of time, there is some doubt as to whether the entire component assemblage is of the same general age.
The tremendous productivity of the surface, which yielded up to 300 flakes per square foot, and the great variety of
projectile points represented in the assemblage tend to support this view. However, the first of these points, that of
productivity, is mitigated because the bulk of chipping detritus represents comparatively few cores. Thus, in one case,
almost 900 flakes, all struck from a core or cores of the same cryptocrystalline silica material, were found in an area
of less than fifteen square feet. Commonly such assemblages contained from 150 to 400 flakes. Other facts also
suggest that the bulk of cultural materials was deposited shortly before the surface became inactive. Bone, although
rare, showed no signs of weathering when it was recovered. Rock piles and alignments of granite cobbles were found
resting on the surface; the action of the wind had not excavated depressions for any of these.

Despite these facts, it cannot be denied that a small portion of the material could antedate the deposition of
the majority of the flakes, the bone, and the rock alignments. Even if this is the case, the artifact assemblage suggests
that all of the cultural materials represented derive from the Frenchman Springs Phase. [29]

Artifact Assemblage. The artifact assemblage from Cultural Component III was fairly large and quite diverse.
Its 199 artifacts include several point types, as well as knives, core tools, scrapers, gravers, possible blades and cores,
drills, and cobbles scraping planes. In addition there were about fifty specimens similar to those called 'bolas stones' by
Cressman (1960: Fig. 47b).

Projectile points, of which there were eighteen, form the most important part of the assemblage. Besides many
leaf-shaped specimens, Cold Springs Side-Notched, Rabbit Island Stemmed, and rudimentary stemmed and corner-
notched points are represented. Three of these specimens, a stemmed point (Fig. 11, o), and two rudimentary corner-
notched points (Fig. 11, p, r), are of basalt, a material which at this time level is characteristic solely of the Cold
Springs Phase. However, both of the Cold Springs Side Notched points associated with this component are of
cryptocrystal-line silica. Looking at the component in terms of these associations, and assuming that the associations
have been correctly made, the only artifact which might be considered out of place is a Rabbit island Stemmed point (Fig. 11, s). Again considering the assumption we have made to be true, this point could not be earlier than the rest of the assemblage, though it could easily be of the same age or of a slightly later period.

Thus, as a calculated guess, I would place Cultural Component III in the early Frenchman Springs period, transitional in some measure between that phase and the Cold Springs Phase.

Artifact Catalog.

Chipped stone artifacts (191)

Stemmed projectile points (8)
- (3) Type 1 (Fig. 11, m-o)
- (1) Type 2 (Fig. 11, l)
- (1?) Type 2 (Fig. 37, p)
- (1) Type 3 (Fig. 11, s)
- (3) Type 4 (Fig. 11, p-r)

Leaf-shaped projectile points (6)
- (3) Type 1 (Fig. 11, a-c)
- (3) Style 1 (Fig. 11, e-g)

Triangular projectile points (1)
- (1) Form 4

Semi-triangular projectile points (1)
- (1) Type 2 (Fig. 11, h)

Lanceolate projectile points (2)
- (2) Form 1 (Fig. 11, i-j)

(11) Fragments of projectile points and knives

Knives (40)
- (2) Type 1 (Fig. 11, d)
- (5) Type 2 (Figs. 12, i-j; 48, a-b)
- (1) Style 7 (Fig. 12, e)
- (1) Style 10
- (1) Miscellaneous knife (Fig. 52, f)

(30) Knife fragments

Core tools (16)
- (6) Type 1 (Figs. 12, f-g; 53, d)
- (4) Type 2
- (1) Form 1 (Fig. 53, j)
- (5) Form 2 (Fig. 53, k-l) [30]

Scrapers (56)
- (9) Type 1 (Fig. 12, h)

Type 2 (16)
- (1) Type Variant 2B (Fig. 12, k)
- (1) Type Variant 2C
- (14) Type Variant 2D

Type 3 (4)
- (3) Type Variant 3A (Fig. 12, c)
- (1) Type Variant 3B (Fig. 12, d)

(5) Style 1
(3) Style 3
(5) Style 4
(4) Fragments of end or side scrapers
(10) Fragments of other scrapers

Gravers (2)
- (1) Type 1
- (1) Style 1 (Fig. 12, b)

(5) Micro-blades (Fig. 61, a-b)
(2) Micro-blade cores (Fig. 62)
(3) Drills (Fig. 11, k)
(4) Cobble scraping planes (Fig. 65, d)
(4) Miscellaneous cobble implements (Fig. 66, a)

Total number of artifacts (199)

FLAKES FROM BENEATH CULTURAL COMPONENT III

Approximately two to three feet below Cultural Component III alluvium from the Sunset Canyon fan was encountered. It contained flakes of cryptocrystalline silica numerous enough to leave no doubt but that they derived from cultural deposits. As only the surface of the gravel was tested, it is difficult to determine whether these flakes were a part of the gravel deposit or whether they were deposited on top of the gravels. In any event, being overlain by Stratum 3, they are at least late Altithermal in age. As no artifacts were recovered, nothing can be said of cultural affinities.

CULTURAL COMPONENTS IV AND V

Although they are designated differently and their assemblages catalogued as discrete groups, it is very probable that Cultural Components IV and V are really only one component, a portion of which has been altered slightly through weathering and erosion. Accordingly, they will be dealt with in the same discussion.

Stratigraphy. Cultural Components IV and V were encountered in the lower portion of Stratum 4 in the House Pit 15 excavations (Figs. 4, 5 and 6). They are underlain by Cultural Component II of the Vantage Phase and overlain by several components of the Quilomene Bar Phase. Cultural Component IV is stratigraphically earlier and consists of scattered lenses of midden in which artifacts, bone and chipping detritus, fine flecks of charcoal, and a hearth were encountered. Cultural Component V directly overlies Cultural Component IV, but unlike the latter was distributed over the entire area of the excavation. It is not characterized by any stain. The only thing which distinguished it from the matrix sand is a concentration of cultural debris. [31]

Because of the odd distribution of Cultural Component IV and the way it is blanketed by Cultural Component V, it is probable that the latter is merely the weathered surface of the former.

Artifact Assemblages. (Figs. 13 and 14). In a general way the artifact assemblages bear out this conclusion, although a few minor differences might possibly suggest a very slight time gap between the two. Each component contains Rabbit Island Stemmed points, small leaf-shaped points, ground and drilled steatite, scrapers, knives, bone and chipping detritus, and the like. However, Cultural Component V also contained Quilomene Bar Base-Notched points, incised bone, and graphite pendants. Although the presence of a characteristically later point type might suggest that Cultural Component V was indeed more recent, it should be pointed out that the assemblage from this component (124 artifacts) is four times that of Cultural Component IV (28 artifacts). Thus, such inequities of distribution might easily occur.

For these reasons Cultural Components IV and V are best treated as a single component. However, the artifact catalogs will be presented separately.

The Artifact Catalog for Cultural Component IV.

Chipped stone (26)
Stemmed projectile points (1)
(1) Type 3 (Fig. 13, c)
Leaf-shaped projectile points (2)
(2) Style 1 (Fig. 13, a-b)
(2) Projectile point or knife fragments
Knives (6)
(1) Type 2 (Fig. 13, c)
(1) Style 9 (Fig. 13, d)
(4) Knife fragments
Core tools (1)
(1) Type 1 (Fig. 13, g)
Scrapers (5)
Type 2 (1)
(1) Type Variant 2D
Type 3(1)
  (1) Type Variant 3A
  (1) Style 1
  (2) Scraper fragments
Gravers (1)
  (1) Style 1 (Fig. 13, f)
  (8) Utilized flakes
Stone tools of percussion (1)
Hammerstones (1)
  (1) Style 1
  (1) Ground and drilled steatite (Fig. 13, h)

Total number of artifacts (28)

Artifacts which Derive from Cultural Components IV or V. The following artifacts occurred at the contact between Cultural Components IV and V, and in material at the bottom of Cultural Component V which was very lightly stained. [32]

Chipped stone artifacts (34)
  Stemmed projectile points (3)
    (3) Type 3 (Fig. 13, l-m)
  (4) Projectile point or knife fragments
Knives (6)
  (1) Style 8 (Fig. 13,i)
  (5) Knife fragments
Core Tools (2)
  (1) Type 1 (Fig. 13, k)
  (1) Type 2
Scrapers (7)
  (3) Type 1
  (2) Fragments of end or side scrapers
  (2) Fragments of other scrapers
Gravers (1)
  (1) Style 1
  (11) Utilized Flakes
(1) Basalt spall scraper
Stone tools of percussion (1)
  Hammerstone (1)
  (1) Style 1

Total number of artifacts (36)

Artifact Catalog for Cultural Component V. Cultural Component V was much more extensive than Cultural Component IV and, expectedly, yielded many more artifacts.

Chipped stone artifacts (113)
  Stemmed projectile points (10)
    (7) Type 3 (Fig. 14, a-f)
    (1) Type 4 (Fig. 14, g)
  Type 5 (2)
    (1) Type Variant 5A (Fig. 14, i)
    (1) Type Variant 5B (Fig. 14, h)
Leaf-shaped projectile points (1)
  (1) Type 1 (Fig. 14, j)
(15) Projectile point or knife fragments
Knives (12)
  (1) Type 1
  (1) Style 1
  (1) Form 4 (Fig. 14, 1)
(1) Miscellaneous knife (Fig. 14, k)
(8) Knife fragments
Core tools (3)
(3) Type 1 (Fig. 53, b)
Scrapers (30)
 Type 2 (6)
 (6) Type Variant 2D
 Type 3 (2)
 (2) Type Variant 3A (Fig. 14, n) [33]
(6) Style 1
(2) Style 3
(1) Style 4
(2) Fragments of end or side scrapers
(11) Fragments of other scrapers
Gravers (2)
 (2) Type 1 (Fig. 14, m)
(40) Utilized flakes
(1) Edge-ground basalt spall
(2) Miscellaneous flaked cobble tools
Beads and pendants of stone (3)
 (3) Style 2 (Fig. 14, r-t)
(1) Piece of ground and drilled steatite (Fig. 14, o)
Bone and antler artifacts (4)
 Projectile points (1)
 (1) Style 1 (Fig. 14, p)
Beads and pendants (2)
 (2) Fragments of incised bone objects
(1) Fragmentary bone artifact (Fig. 14, q)

Total number of artifacts (124)

Discussion. By comparing Figures 11 and 12 with Figures 13 and 14 it will become obvious that some potentially important differences exist between the assemblages from Cultural Component III on the one hand and Cultural Components IV and V on the other. Can such diverse assemblages from the same site represent the same phase? The curious fact is that neither of these assemblages is especially representative of the Frenchman Springs Phase. The Cultural Component III assemblage may be interpreted as transitional between the Cold Springs and Frenchman Springs phases, while the assemblages from Cultural Components IV and V are transitional between the Frenchman Springs and Quilomene Bar phases. It should be added, however, that the projectile point assemblage from Cultural Component III is so marginal to normal Frenchman Springs assemblages that it may actually prove to be the representative of an as yet unidentified phase of short duration which fits in between the Cold Springs and Frenchman Springs phases.

Based on a C¹⁴ date of about 2250 B.C. from a Cold Springs component at a site (45YK5) north of Priest Rapids, it is estimated that Cultural Component III dates from between 1600 and 2000 B.C. Cultural Components IV and V appear to be significantly more recent, geological estimates and typological comparisons placing them between 800 and 1200 B.C.

Shortly after these estimates were made, Dr. Greengo of the University of Washington obtained a C¹⁴ date from a more typical Frenchman Springs component at Schaake Village, a site located a few miles south of 45KT28 (American Antiquity 1964: Notes and News). This date, 1450 B.C., falls between and confirms the inferential age estimates for Cultural Component III and Cultural Components IV and V.

The Areal Distribution and Characteristics of the Frenchman Springs Phase. Frenchman Springs Phase components appear to be widespread in the western Plateau south of the Okanogan Highlands, but as yet remain unreported from much of the nuclear and all of the eastern portions of the Plateau. The most northerly, well-documented occurrences are confined to 45KT28, Schaake [34]
Village (Swanson 1962a; 1962b), Cedar Cave (Swanson 1962a), and 45GR27 (Daugherty 1952). Moving further south, we find only one well-documented occurrence of the Frenchman Springs Phase, Rabbit Island I (Crabtree 1957). The early levels of another site, located at the confluence of Wenas Creek and Yakima River, have also been described as closely related to the Frenchman Springs Phase (Warren 1959; Swanson 1962a), but the early artifact assemblage from this site is not duplicated elsewhere in the Plateau and its age and relationship to the Vantage sequence are therefore equivocal.

As with all of the earlier phases represented in the Vantage locale, it is most difficult to define adequately the discriminating characteristics of the Frenchman Springs Phase. The single best characteristic artifact type is the Rabbit Island Stemmed Point (see Type 3). Unfortunately artifact assemblages for the Frenchman Springs and other phases adjacent to it in time and space are too small to point to very many other categorical differences. In the Vantage locale flaked cobble choppers and scraping planes evidently disappear at the beginning of the Frenchman Springs Phase, while leaf-shaped points disappear at the beginning of the Quilomene Bar Phase. Other implements in use during the Frenchman Springs Phase include semi-triangular projectile points or knives, gravers, scrapers of virtually all varieties, both round and elongate core tools, pestles, edge-ground cobbles, grinding slabs, bone points, antler splitting wedges, bone projectile points, and awls(?). More exotic artifacts which have been recovered include an antler comb, a quartz crystal pendant, graphite pendants, mussel shell disc beads, ground and drilled steatite, a tubular pipe, incised bone objects, and a ground slate tabular object.

Though documented Frenchman Springs components are very few, they nevertheless reflect a variety of site types and ecological environments. Vantage Cave was, at least in part, used for purposes of storage, the 45KT28 and Schaake Village components evidently represent hunting stations, 45GR27 was centered around a large roasting pit surrounded with hopper mortars and probably represents a camas roasting station, and Rabbit Island I was a burial site. These sites and their respective assemblages clearly reflect seasonal hunting and gathering patterns designed to utilize most of the resources which Plateau peoples considered important in early historic times. However, the absence of winter villages indicates that the economic round was organized differently from that of ethnographic times.

Although there is presently no evidence to suggest that fishing played a role in the economy, it would be hazardous to assume that such a potentially important resource remained totally unutilized. Further research, particularly along the tributaries of the Columbia River, may bring to light fishing stations.

The Quilomene Bar Phase

The Quilomene Bar Phase is a wholly new designation, never before proposed for any area in the Plateau. It is being offered here primarily on the strength of data from 45KT28, and is thought to have existed between 800 B.C. and the beginning of the Christian Era.

CULTURAL COMPONENT VI

Stratigraphy. Cultural Component VI, the only Quilomene Bar Phase component at the site, is identified with numerous interfingering lenses of cultural debris found in the upper three-fourths of Stratum 5 and concentrated at the northern end of the site, between House Pit 2 and House Pit 26 (Fig. 4). Two separate series of these lenses were tested, one at House Pit 15 and one in the vicinity of House Pit 13. In each area four distinct culture-bearing deposits were encountered. The four subcomponents which were found in the excavations beneath House Pit 15 were restricted to the upper three feet of Stratum 5. The stratigraphically earliest and most extensive of these covered a

† *A fifth possible Frenchman Springs component is embodied by the Shalkop Site where two pit houses were encountered which Swanson (1962b) has assigned, respectively, to the early and late Frenchman Springs period. The artifact assemblage from the earlier pit house is too small to be of comparative value, but the projectile points from the more recent pit house may be logically interpreted as diagnostic of a late Frenchman Springs assemblage, at least in the absence of other data which would tend to support a more recent date for the site. Because the projectile point types recovered from the site also occur in small quantities in the Cayuse III Subphase, such confusing data might include Columbia Plateau Comer-Notched Points, Wallula Rectangular-Stemmed Points, Columbia Plateau Side-Notched Points, or a number of other stemmed and shouldered varieties common in late prehistoric times. Although the total artifact sample is small, the fact that such point types were not recovered strongly supports Swanson's interpretation of the age of the Shalkop assemblage. Until we have more data bearing on this problem I am hesitant about assigning the Shalkop Site to any cultural period or phase.
roughly triangular area of about 90 square feet (Fig. 5). Near its center there were two distinct hearths which were separated from one another by a distance of three feet. They were filled with fire-cracked rock and sand which had been oxidized to a brilliant brown-orange. Bone detritus, probably all of deer, was abundant. Five cervical vertebrae were found fully articulated; other bones were split and scattered. One fish vertebra and a small fragment of freshwater mussel shell also were recovered. Artifacts were especially plentiful near the central hearth area and included end scrapers, core tools, knives, and utilized flakes. Two chipped stone projectile point fragments were recovered; both were Quilomene Bar Base-Notched points (Fig. 15, c). In addition the tip of a biconical antler projectile point (Style 1) was recovered (Fig. 16, b).

The remaining three lenses occurred in the upper eighteen inches of Stratum 5 and were little more than the telltale remains of small hearths (Fig. 20 and 21). One contained a large antler wedge, some bone detritus, several flakes, and four fragments of freshwater mussel shell. Another yielded only a stemmed point of aberrant form (Fig. 15, n). The third lens likewise contained but a single artifact (Fig. 15, m), a later variety of The Quilomene Bar Base-Notched point, characteristic of the Cayuse Phase and also in a morphological line between earlier forms of the Quilomene Bar Base-Notched point and the Columbia Plateau Corner-Notched point (Type 6). In some ways, then, the uppermost Quilomene Bar subcomponents resemble components of the Cayuse Phase, though broadly considered they appear to be more representative of the Quilomeme Bar Phase.

In the House Pit 13 area, four Quilomeme Bar Phase subcomponents were encountered in the upper three-fourths of Stratum 5. Like the three small lenses described above, the most recent of these subcomponents was located only fourteen inches below the surface of Stratum 5 and consisted of a hearth remnant about six feet in diameter. It contained split deer bone, flakes, and a small quantity of artifacts, including an unusual form of pentagonal knife (Fig. 15, l).

The three deeper subcomponents extended throughout the test area (Fig. 10), and unlike their more recent counterparts were not characterized by a dark midden stain. In fact the only thing which set them physically apart from their sandy matrix were layered concentrations of bone detritus, waste flakes, fire-cracked rock, and artifacts. These items were essentially the same in each subcomponent, deer being the major or possibly only animal represented in the faunal assemblage. No fish vertebrae were recovered, and only one minute fragment of freshwater mussel was encountered. Artifacts included Quilomene Bar Base-Notched points (Type Variant 5A), triangular points (or point blanks), knives, gravers, scrapers, core tools, utilized flakes, and cut bone detritus.

Three features were noted, two of them, a post mold and a hearth, coming from the earliest of the four subcomponents. The hearth, which was about three feet in diameter, was marked by charcoal-stained sand and contained a large amount of fire-cracked rock. The post mold was located about fifteen feet away; it was marked by a light midden stain which was one-half an inch in diameter and extended four inches below the surface of the subcomponent. The third feature, located in the next to the earliest subcomponent, was a cache or unusually high concentration of artifacts, including four gravers, two end scrapers, a side scraper, three knife fragments, a core tool (Type 2), and six utilized flakes.

Artifact Assemblage. As the discernibly important differences between the artifact assemblages from the various subcomponents have been described above, individual subcomponent catalogs would take up more space than they are worth. Therefore, all of the subcomponent assemblages have been unified into the following catalog. [36]

Artifact Catalog.

Chipped stone artifacts (193)
Stemmed projectile points (8)
  Type 5 (7)
    (6) Type Variant 5A (Fig. 15, a-d)
    (1) Type Variant 5C (Fig. 15, m)
    (1) "Type" 7 (Fig. 15, n)
Triangular projectile points (2)
  Type 1 (2)
    (2) Type Variant 1C (Fig. 15, e-f)
Semi-triangular projectile points or knives (2)
  (1) Type 1 (Fig. 15, 1)
  (1) Type 2 (Fig. 15, g)
Pentagonal knives or projectile points or knives (2)
  (1) Form 1 (Fig. 15, 1)
(9) Projectile point or knife fragments
Knives (30)
(4) Type 1
(2) Type 2
(24) Knife fragments
Core tools (9)
(2) Type 1 (Fig. 17, a-b)
(7) Type 2 (Fig. 17, c-e)
Scrapers (50)
(14) Type 1 (Fig. 16, f-j)
Type 2 (15)
(9) Type Variant 2C (Fig. 16, k-n)
(6) Type Variant 2D
Type 3 (1)
(1) Type Variant 3A
(2) Style 1
(1) Style 2
(2) Style 3
(2) Style 4
(6) Fragments of end or side scrapers
(7) Fragments of other scrapers
Gravers (5)
(5) Type 1 (Fig. 16, d-e)
(1) Drill or awl (Fig. 15, i)
(4) Possible micro-blades (Fig. 61, d)
(72) Utilized flakes
(1) Basalt spall scrapers
(2) Miscellaneous flaked cobble tools
Stone tools of percussion (2)
Hammerstones (1)
(1) Style 1
Crushing implements (1)
(1) Style 1
Bone and antler artifacts (9)
Projectile points (1)
(1) Style 1 (Fig. 16, b) [37]
(1) Spatulate scraper
(2) Antler splitting wedges (Fig. 16, a)
(1) Fragmentary antler artifacts
(1) Fragmentary bone artifacts
(3) Cut bone detritus (Fig. 16, c)

Total number of artifacts (207)

DISCUSSION

Because 45KT28 is the only site at which the Quilomene Bar Phase has been adequately defined, our overview of the phase as a whole must necessarily be quite limited. Based on estimates for the end of the Frenchman Springs Phase and the beginning of the Cayuse Phase, it is thought to have lasted from ca. 800 B.C. to about the beginning of the Christian Era.

Published comparative data are almost nonexistent, being limited to material from Bed B3 at Schaake Village (Swanson 1962b) and possibly from the earlier deposits at Sam's Cave, a rock-shelter opposite Steamboat Rock in Grant County (Osborne 1959).

As of the writing of this report, the single reliably diagnostic artifact type is the Quilomene Bar Base-
Notched projectile point (Type 5), which is also of minor importance very late in the Frenchman Springs Phase and the Cayuse Phase. During the Quilomene Bar Phase it appears to be restricted largely to Type Variant 5A, a particular variation characterized by deep base-notches and large, square barbs. However, at the beginning of the Cayuse Phase a whole new series of variants appear to develop out of this early form.

Quantitative differences may include the abundant use of well-made end and side scrapers, though it must be emphasized that this apparent trend may be a function of inadequate sample size or the site's particular position in the yearly economic round. Similarly, other distinguishing features may include the introduction of chopper-like implements which were used for crushing rather than cutting (see stone implements of percussion).

THE CAYUSE PHASE

Introduction

The Cayuse Phase is abundantly represented in the archaeology and literature of the Upper Columbia, although it remained for Earl Swanson (1956; 1958; 1962b) to identify it as a phase and suggest what its significance might be in the prehistory of the Columbia Plateau. Due to the lack of well defined sequences elsewhere along the Upper Columbia, there has been no previous attempt at a detailed examination of Swanson's proposed Cayuse Phase. Fortunately, stratigraphic relationships and the large quantity of artifacts from 45KT28 allow a detailed analysis of the local manifestation of the Cayuse Phase, while recently published evidence from other parts of the Columbia Plateau permits a more inclusive comparative analysis.

The Cayuse Phase assemblages from 45KT28 contain 3,983 tools, tremendous quantities of bone and flaking detritus, and numerous site features, including many pit houses. In order to cope with the many lines of inference which these data suggest, the analysis of the Cayuse Phase has been divided into six sections which deal with (1) the age, duration, and characteristics of the phase, (2) implications of the phase for the prehistory of the Columbia Plateau, (3) stratigraphic interrelationships between the Cayuse Phase subcomponents at 45KT28, (4) the three local Cayuse Phase sub-phases, their respective subcomponents, characteristics, and significance, (5) the development of pit house types in the Vantage locale during the Cayuse Phase, and (6) comments on Swanson's identification and interpretation of the Cayuse Phase and its various subphases.

Characteristics of the Cayuse Phase

INTRODUCTION

The Cayuse Phase is represented in the archaeological record throughout the Columbia Plateau as well as in many immediately adjacent areas, including the eastern foothills of the Cascade Mountains, the Okanogan Highlands, and the westernmost foothills of the Rocky Mountains. Although it appears to have begun approximately at the beginning of the Christian era everywhere it occurs, it is not a monolithic archaeological entity devoid of significant internal variation. On the contrary, it is divisible into a series of regional geographic variants each of which is composed of more or less unique temporal subphases. While regional variation is still poorly understood, the general characteristics of the Cayuse Phase can be specified in some detail.

GENERAL CHARACTERISTICS OF THE CAYUSE PHASE

The Site Complex. The emergence of the Cayuse Phase is not characterized as much by the appearance of an obviously different material culture as it is by the apparently abrupt emergence of a dramatically new configuration of site types which occur in particular relationships both to one another and to the topographic and ecological zones of the Columbia Plateau. The most basic feature of this change is the appearance of identifiable site complexes in topographically protected locations in the peripheral portions of the Columbia Plateau.

"Site complex" is a term which has been utilized by Nelson and Rice (1966) to describe geographically associated sites which are of the same general age, which are functionally diversified, and which could have been utilized concomitantly for different purposes by a single group of people. The late prehistoric, Cayuse Phase site complexes which were located on the Snake River at the southeastern margin of the Columbia Plateau by Nelson and Rice (1966) are composed of extensive open sites in association with well defined burial areas. The open sites frequently contain the remains of house structures which indicate they were used as winter villages or camps, and storage shelters, storage pits, pictographs, petroglyphs, and fish walls frequently occur at sites within the site complex. This basic configuration, having a nucleus of large open sites and burial areas containing or closely associated with a variety of other special features, is characteristic of the Cayuse Phase throughout the Columbia Plateau.
The distribution of such site complexes is difficult to define with absolute certainty primarily because Plateau archaeologists have never before dealt with such a unit or specifically attempted to demonstrate its presence or absence. Nevertheless, there is sufficient information contained in survey and site reports to state that site complexes are distributed along the fringes of the Columbia Plateau and in the adjacent Canadian Plateau.

A survey in the east Kootenay region of the Canadian Plateau has revealed several concentrations of sites, especially at the northern ends of Columbia and Windermere lakes (Borden 1956). Although the sites are not individually described, structural remains are said to be common and there is at least one large burial area present at each one of the large site clusters. Further to the west, a survey of the Okanogan Highlands (Caldwell 1953-54) revealed large numbers of sites along the shores of Lake Okanogan and in the Similkameen Valley. Similar concentrations were found somewhat further to the south on the Okanogan River. Although descriptions of the individual sites have not been published, the high frequency of structural remains and the presence of burial areas, rockshelters, and pictograph sites indicate that site complexes are very common in the sheltered valleys of the area. Moreover, along the southern skirts of the Okanogan Highlands and in the northernmost portion of the Columbia Plateau, both survey and excavation have established the presence of site complexes (Osborne 1949; Osborne, Crabtree, and Bryan 1952; Sloan 1963; Grabert 1966; Collier, Hudson and Ford 1942).

On the western margin of the Plateau, surveys of the Vantage locale have revealed abundant evidence for the presence of site complexes (Shiner 1951b; Lee 1955). Excavated examples include 45KT28 with its adjacent burial areas and rockshelters, a series of pit house, rockshelter, burial, and petroglyph sites in the vicinity of Schaeke Village (Swanson 1962a; Kidd 1964; Osborne 1956-57), and a small association of pit house sites, burial areas and petroglyph sites south of Vantage (Massey and Nelson 1958).

Survey work (Smith 1910; Weeks 1962) and the excavation of a village and adjacent burial yard at the mouth of Wenas Creek make it clear that site complexes are common in and around the Yakima Valley (see Warren 1959). Both site survey and excavation documents the presence of numerous site complexes along the Middle Columbia and on the Snake River near its mouth (e.g., Shiner 1950a, 1952b; Cole and Newman 1958; Cole and Leonhardy 1964). Outstanding examples where there has been large scale excavation include the Wildcat Canyon site complex (Cole 1963; 1964; 1965) and the Wakemap Mound site complex (Strong, Schenck, and Steward 1930; Caldwell 1956; Butler 1958a).

Site complexes are present but infrequent along much of the Lower Snake, a feature which appears to be correlated with a low frequency of identified structural remains and ethnographically reported winter villages, facts which will become more significant as the discussion of the Cayuse Phase unfolds. Nevertheless, well documented examples occur at the mouth of the Palouse River (Fryxell and Daugherty 1962; Nance 1966; Osborne 1948), the mouth of the Tucannon River (C. M. Nelson 1966), and at the mouth of Dry Gulch, near Ridpath (C. M. Nelson 1965b:45C011; Sprague and Combes 1966). Local site surveys suggest that still others exist (see Osborne 1948; C. M. Nelson 1965b).

Further to the east, the presence of site complexes has been well established for the southeastern periphery of the Columbia Plateau by Nelson and Rice (1966). Unfortunately, our entire knowledge of the eastern margin of the Columbia Plateau comes from two preliminary surveys around Coeur d'Alene and Pend Oreille lakes (Shiner 1950b, 1953b; Miller 1959). However, several sets of associated burial areas and open sites do indicate that site complexes did exist in the Coeur d'Alene area (Miller 1959:41).

This brief discussion of the distribution of site complexes has been designed to illustrate the range of their distribution and is not meant to be an exhaustive list of known occurrences. Those interested in compiling such a list will find evidence for well over 100 site complexes in the archaeological literature of the Columbia Plateau.

From everywhere there are reasonable samples of artifacts in association with site complexes, assemblages are dominated by projectile point types known to be characteristic of the Cayuse Phase, and there is no known site complex associated with tool types which antedate the Cayuse Phase. One of the best dated Cayuse Phase site complexes is located at Wildcat Canyon, where C14 dates (see below) indicate that it appeared in the first century B.C. and at the very beginning of the Cayuse Phase.

Structural Remains. The remains of pit houses and other semi-permanent dwellings are associated closely with distribution of site complexes and the Cayuse Phase itself. And, as the proceeding discussion has already indicated, they are very frequently constituent parts of site complexes.
There are only two known occurrences of house remains which might antedate the appearance of the Cayuse Phase in the Columbia Plateau. The earliest is at Cold Springs (Osborne and Shiner 1949; Shiner 1961), where house floors have been reported in association with projectile points characteristic of the Cold Springs Phase. The stratigraphy at Cold Springs is simple, but difficult to interpret archaeologically. Volcanic ash, probably from the eruption of Mt. Mazama about 4500 B.C. (cf. Fryxell 1965), is overlain by a light, undifferentiated midden (probably floodplain loess) the lower portion of which is said to be sandy in many areas. Within the midden local stratigraphy can be defined on the basis of lenses of fresh water mussel shells, but precise lateral correlations over large distances are impossible. The presence of Cascade and Cold Springs Side-Notched projectile points immediately above the volcanic ash demonstrate the presence of a Cold Springs Phase component. However, the bulk of the overlying midden, which is approximately four feet thick, contains so few diagnostic artifacts that it cannot be assigned to any phase. Yet the presence of historic artifacts in the upper portion of the midden make it clear that terminal occupation occurred in the early historic period.

A large number of pit houses have been excavated from the uppermost portions of the midden at Cold Springs. Very few artifacts were recovered from these structures and no diagnostic projectile points were found in direct association. However, on the basis of two large, crude, leaf-shaped knives, Shiner correlates one of the house structures with the Cold Springs Phase component at the site. More recent excavations in the southern Columbia Plateau have shown, however, that such knives are not especially diagnostic of any phase. For example, fragmentary specimens have been reported from Cayuse Phase components which are clearly stratified above components of the Cold Springs and later phases and in association with a C14 date of 230 ± 165 A.D. (C. M. Nelson 1966:43, Fig. 28, m).

On the other hand, there is a good deal of circumstantial evidence to suggest that the house structures at Cold Springs are protohistoric in age. The protohistoric and early historic structures which are best known from the Cold Springs locale are saucer-shaped with sloping side-walls, possess indistinct floor areas, contain no evidence for superstructural members, and are typically associated with very few diagnostic tools (Osborne and Shiner 1951; Osborne 1957). These are the precise characteristics of the structures at Cold Springs.

A more substantial case can be made for pre-Cayuse structural remains at the Shalkop Site, a small open site in the Vantage locale. Here there are two house pits associated with a total of five diagnostic projectile points, including four simple stemmed examples and one leaf-shaped point or knife, the presence of which prompted Swanson (1962a) to interpret the site as a Frenchman Springs Phase component. The projectile point types found at the Shalkop Site are also characteristic of the protohistoric Cayuse III Subphase, where they occur in association with other late prehistoric point types. Although the absence of these later projectile point types suggests a Frenchman Springs Phase association, certain features of the five stemmed projectile points are not typical of Rabbit Island Stemmed points, the type most closely associated with the Frenchman Springs Phase. For example, two of the specimens are slightly barbed and two are serrated, characteristics which do not appear in the published Rabbit Island Stemmed specimens (see Type 3; Swanson [41] 1962a: Figs. 45, m-n 36, a-f; Swanson 1962b; Crabtree 1957: Plate 8), but which are common features in the Cayuse III Subphase. Therefore, the possible association of house structures with the Frenchman Springs Phase should be treated with skepticism until corroborative evidence is found.

In contrast to their dubious association with earlier phases, the structural remains of semi-permanent dwellings are very numerous during the Cayuse Phase. They first appear at the very beginning of the phase and remain common features until well into the historic period (see discussion of the age of the Cayuse Phase).

The distribution of house remains coincides with the distribution of site complexes. Each occur in areas marginal to the Columbia Plateau and in the adjoining Canadian Plateau.

In the Canadian Plateau, Borden (1956) reported numerous house structures from the east Kootenay region and linked them with the known ethnographic settlement pattern of the area. To the west Caldwell reports the presence of structural remains at at least 24 sites along the Okanagan and Similkameen valleys (Caldwell 1955-54). They include circular and rectangular subterranean structures as well as stone and log lined structures. Although the exact age of these dwellings is not known, the presence of wooden structural members at some and the absence of trees from the depressions of many others suggest that a substantial percentage are protohistoric in age. Structural house remains are also common along the southern fringes of the Okanagan Highlands and include the remains of several early historic mat lodges (Osborne 1949; Osborne, Crabtree, and Bryan 1952; Sloan 1963; Grabert 1966; Swanson 1958-59). It is interesting to note, however, that Collier, Hudson, and Ford (1942) do not note the presence of structural remains in the Grand Coulee Dam reservoir. Nevertheless they (1942:37) state that a large number of saucer-like depressions were tested on the Columbia and lower Spokane rivers, and that none proved to be house remains. However, since closed, circular depressions are not likely to occur naturally along the floodplain of a river.
such as the Columbia, it is possible that they were pit house depressions and that testing was simply not extensive enough to verify this fact. Along much of the Upper Columbia pit house depressions have been filled with up to four feet of sterile overburden through post-occupational flooding. Many of the largest and most recent house structures have very little occupational fill and floors which are very difficult to define in the absence of extensive testing. In such cases, simple shovel testing to a depth of two or three feet will provide no evidence of structural remains.

Along the western margin of the Columbia Plateau, house remains are extremely common both along the Columbia River (Shiner 1951b; Lee 1955; Swanson 1958, 1962a; Osborne 1956-57; Kidd 1964) and in the Yakima Valley (Smith 1910; Warren 1959; Weeks 1962). Excavation has consistently revealed that they are associated with Cayuse Phase components.

This pattern is continued along the Middle Columbia, where surveys and site excavations have revealed large numbers of structural remains in association with Cayuse Phase components and tool assemblages (Strong, Schenck, and Steward 1930; Shiner 1950a, 1952b, 1961; Cole 1963, 1964, 1965; Cole and Cressman 1959, 1960, 1961; Cole and Leonhardy 1964; Cole and Newman 1958; Caldwell 1956; Cressman and Cole 1962; Butler 1958a; Osborne 1957; Osborne and Shiner 1949, 1951).

Both survey (Osborne 1948; Drucker 1948a) and excavation (Kenaston 1966) demonstrate that the downstream portion of the Lower Snake also contains a number of sites at which structural remains occur. Excavations at the Harder (Kenaston 1966) and Three Springs Bar (Daugherty 1965: personal communication) sites have revealed such dwellings are associated with Cayuse Phase projectile point assemblages. East of Three Springs Bar site surveys have revealed very occasional pit house sites as far upstream as the mouth of the Palouse River. A recent resurvey of the Snake River between the mouths of the Palouse and Clearwater rivers has revealed an almost total absence pit house depressions. The single site reported by C. M. Nelson (1965b: 45GA5) has been found to be a series of pumping pits excavated by a local farmer. The absence of identifiable structural remains in this portion of the Lower Snake correlates with low site densities, a general lack of well defined site complexes, and a low density of ethnographically reported winter villages.

Further up the Snake River, near the town of Lewiston, over twenty sites have been located which contain more than 100 house depressions (Nelson and Rice 1966). To the east of this area Butler (1966) has also reported on a pit house site which was first occupied in the first century B.C.

Our archaeological knowledge of the eastern margin of the Columbia Plateau is very limited. A site survey which concentrated on Coeur d'Alene and surrounding lakes revealed no house depressions (Miller 1959). However, Miller notes that local collectors have reported house depressions from neighboring river valleys, an observation which agrees well with the ethnographic distribution of winter villages in the area (see Ray 1936: Fig. 3).

Further to the north there was some limited testing and survey work done by the Smithsonian near the northern end of Lake Pend Oreille, but no house remains were found (Shiner 1950b; 1953b).

Although site complexes appear to be rare or absent in the coulee area of the west-central Columbia Plateau, pit house remains are relatively common (Drucker 1948b; Osborne 1959; Daugherty 1952). Excavations at five of these sites have shown that the house structures are associated with projectile point assemblages characteristic of the Cayuse III Subphase. The fact many site complexes have not been identified from this area is partially a function of site size and the protohistoric nature of the winter occupation sites. It will be more fully examined in the discussion of the Cayuse III Subphase.

*Increase in the Number and Density of Sites.* In those geographic areas in which site complexes are distributed, both site surveys and excavations demonstrate that there is a dramatic increase in the frequency of sites at the beginning of the Cayuse Phase. For example, a thorough survey of one area at the southeastern margin of the Columbia Plateau revealed 155 archaeological sites (Nelson and Rice 1966). Of these, 37 are Cayuse Phase burial areas, 17 are Cayuse Phase storage shelters, and 97 are open sites of which 91 contain late prehistoric, Cayuse Phase components. Only 9 sites contain components which are known to antedate the Cayuse Phase, and while excavations will undoubtedly produce more pre-Cayuse components, the topographic position of most of the known sites suggests that they never will be found nearly as numerous as Cayuse Phase components. The extremely lopsided distribution of Cayuse and pre-Cayuse components in this portion of the Columbia Plateau may be partially due to the high local density of site complexes. However, if we examine the situation further westward on the Snake River, where site complexes are uncommon, similar situation will be found (e.g., C. M. Nelson 1965b; Sprague and Combes 1966). Known Cayuse Phase components always outnumber the combined totals for all other proceeding phases. This is not only true for the Lower Snake, it also holds for the Middle Columbia, the Yakima Valley, the Upper Columbia, the coulee area of the west-central Columbia Plateau, the Okanogan Highlands (viz. Caldwell 1953-54; Swanson 1958-
Although conditions of preservation and sampling procedures generally favor a more comprehensive knowledge of recent prehistoric events, these factors do not entirely account for the disparity between the numbers and densities of Cayuse Phase and pre-Cayuse Phase components throughout the Columbia Plateau. This disparity looms ever larger as we consider (1) that the percentage of pre-Cayuse Phase components has not risen greatly as increased research has provided more primary data, (2) that pre-Cayuse Phase components do not outnumber Cayuse Phase components in areas where there has been intensive survey and excavation, (3) that Plateau prehistorians have searched for early sites more diligently than they have for recent ones, and (4) that the pre-Cayuse occupation of the Columbia spans at least 8,000 years, while the Cayuse Phase persists something on the order of 2,000 years. Therefore it seems reasonable to conclude that larger numbers of sites and greater site densities are actually characteristics of the Cayuse Phase. These conclusions apply particularly to the topographically protected areas where winter camps and villages were maintained. Cayuse Phase sites lying outside these areas also may be more numerous, but there are not yet enough archaeological data to state this with certainty.

Increase in Site Size. Throughout the Columbia Plateau the areal extent of Cayuse Phase components tends to be greater than that of pre-Cayuse Phase components. Along the Upper Columbia at sites such as 45KT28, pre-Cayuse Phase components frequently cover less than 25 square yards and rarely have areas in excess of 500 or 1,000 square yards, while Cayuse Phase components commonly cover areas ranging from 5,000 to 30,000 square yards and reach maximum dimensions in excess of 50,000 square yards. Although this pattern generally seems to be consistent throughout the Columbia Plateau, small numbers of early components have been reported which may cover considerable areas. One such early terrace site on the Lower Snake River (C. M. Nelson 1965a; 1965b; 45GA3) traverses over 100,000 square yards. However, it is important to note that this site, and others like it, are composed of localized concentrations of camp debris separated by extensive areas in which only occasional flakes and tools are found. These local concentrations normally cover areas ranging from 50 to 1,200 square yards. Perhaps one of the largest well documented early occupations which is characterized by continuous concentrations of debris in the Cold Springs Phase component at 45C01 (C. M. Nelson 1966: Assemblage 2A), which is estimated to extend over an area of between 1,600 and 2,500 square yards. Early components of comparable dimensions also may exist at Thorn Thicket (Sprague and Combes 1966).

Thus, although there are probably a few pre-Cayuse Phase components which approach the magnitude of the more representative Cayuse Phase components, their geographic density is extremely low both in absolute terms and in comparison with the density of large Cayuse Phase components. Therefore, both the tendency towards increased site size and the far greater density of large components may be considered characteristics of the Cayuse Phase.

The Topographic Setting of Sites. Along lakes and trunk streams and their major tributaries, and other topographically sheltered areas, archaeological sites tend to be concentrated in such places as the mouths of small streams and canyons, the ends of large floodplain bars, places where the floodplains of rivers are narrow, and other highly protected portions of the local landscape (e.g., Nelson and Rice 1966: Fig. 1). This feature appears to be related to the necessity of establishing winter camps and villages in climatically favorable microenvironments near reasonably large winter food supplies, especially game animals such as deer and elk. Moreover, it is a pattern that apparently existed during all periods of Plateau prehistory, although it is difficult to generalize for periods antedating the Cayuse Phase.

However, there is a subtle change within this pattern that corresponds to the beginning of the Cayuse Phase. It is recorded only at floodplain sites, such as 45KT28 and 45C01 (C. M. Nelson 1966), where there is more or less continuous occupation across the boundary marking the emergence of the Cayuse Phase, and it involves the specific part of the site being utilized prior to and after the beginning of the phase. [44]

At such floodplain sites it is possible to distinguish two major geomorphic subdivisions: (1) the active beach zone that is seasonally inundated at periods of normal high water, and (2) the adjacent floodplain that is inundated only at times of serious flooding. The subdivisions are usually separated by a cut bank approximately two meters high. The floodplain is characterized by very fine fluvial sands and silts deposited during occasional periodic floods, floodplain loess, and fine-grained alluvial deposits around the margins of alluvial fans. On the other hand, the active beach zone is characterized by a variety of fluvial and aeolian deposits that are dominated by medium sands.

Although ethnographic information makes it clear that both geomorphic zones were utilized during the Cayuse Phase, recent erosion and active back-cutting of the cut bank make it difficult to archaeologically assess the specific roles which the beach zone may have played. On the other hand, both the ethnographic and archaeological records clearly indicate that the floodplain was utilized for the construction of semi-permanent dwellings, including
semi-subterranean pit houses, mat lodges, and a variety of typologically intermediate structures. Houses were built in this section of floodplain sites for a variety of reasons.

1. The loess and other fine-grained deposits of the floodplain provided reasonable structural support for the open faces of pit house walls. Such open faces soon collapse when excavated into the medium sands of the beach zone. The more consistent, fine-grained deposits of the floodplain also provided greater support for the structural members of houses. These would have to be anchored with much greater care in the beach zone.

2. Both ethnographic and archaeological evidence indicates that house structures were frequently reoccupied on a yearly or semi-yearly basis, and that the depressions of long-abandoned structures were frequently reexcavated, partially because of the initial expenditure of labor necessary to clear the house site and excavate the house pit. Since house sites would be badly damaged by seasonal periods of high water if they were erected in the beach zone, it is not likely that semi-permanent house structures were erected there.

3. Late winter thaws frequently produce episodes of high water that reach the foot of the cut bank at the very margin of the floodplain. Since house structures of the types associated with floodplain sites were primarily winter abodes, their construction in the beach zone might entail abandonment and reconstruction during the winter months at times when food supplies might be short and the necessity for continuous hunting and food gathering at its maximum.

In contrast to the Cayuse Phase, earlier phases are characterized by in situ components in the active beach areas of many floodplain sites and only very sparse evidence for occupation in the floodplain facies of the same deposits (e.g., C. M. Nelson 1966). This indicates that almost all the activities conducted at such sites were carried out in the beach zone and that semi-permanent dwellings were not in use in the floodplain context where they are so characteristic of the Cayuse Phase. Furthermore, this change that occurs in the primary living area, from the active beach zone to the adjacent floodplain, may be interpreted as an accommodation to the construction of semi-permanent houses.

*Population Growth.* Because of the severe winters which occur in and adjacent to the Columbia Plateau, the winter months must be spent in topographically protected areas and at relatively low altitudes. This means that river valleys, deep canyons, protected lake basins, and other sheltered areas must have been the major winter population centers during all periods of Plateau prehistory. Therefore, the size and density of sites in such areas should at least very roughly reflect relative population sizes. As noted above, the evidence indicates that the Cayuse Phase is characterized by larger site areas, greater numbers of sites, far greater densities of sites, and the appearance of large, readily identifiable site complexes. The appearance of these features in topographically protected areas suggest (1) that the Cayuse Phase was characterized by larger, denser populations than proceeding phases, and (2) that there was a relatively sudden population increase at the beginning of the Cayuse Phase.

*Coastal Trade.* Coastal-interior trade apparently became more intensive and shifted in a northerly direction at the beginning of the Cayuse Phase. The evidence in support of this view may be summarized as follows.

Although our information on pre-Cayuse coastal trade is limited, the following facts suggest a link with the coasts of Oregon and southern Washington via the Columbia River.

1. Although ornaments made from local shells, stone, and bone are relatively common prior to the Cayuse Phase in much of the western Columbia Plateau (Crabtree 1957: Rabbit Island I; Daugherty 1952; 45GR27, Feature 1; 45KT28), ornaments manufactured from shells traded inland from the coast are rare, being limited to 15 specimens of *Schizotherus nutally* in two of the Rabbit Island I burials (Crabtree 1957:39-43).

2. Although reported data other than those acquired by Crabtree (1957:39-43) do not indicate the presence of coastal trade items along the Middle Columbia in pre-Cayuse times, information from the Lower Snake River indicates that *Olivella biplicata* were relatively common in at least some portions of the southern Columbia Plateau (Fryxell and Daugherty 1962; C. M. Nelson 1966: Assemblages 2A and 3B). Although this shell has a spotty distribution as far north as the Strait of Juan de Fuca, it is far more abundant further to the south along the coasts of Oregon and northern California, facts which suggest trade up the Columbia and Snake rivers by reason of proximity. The absence of shell trade items in the northern Columbia Plateau also suggest this route. However, it is possible that their apparent absence in the north is due to sampling error instead of relative abundance.

3. Recently Kidd (1964:8-11) has reported the recovery of a small nephrite adze in a component at the Hole-in-the-Wall Canyon site near Vantage, Washington, which he has tentatively correlated with Swanson's Frenchman Springs Phase at a time depth of ca. 1000 B.C. If Kidd's estimate is correct, this adze is the earliest northerly trade item currently reported from the Columbia Plateau and is nearly as old as the earliest reports of such tools from the Fraser River drainage itself. However, the sample size from the earlier Hole-in-the-Wall Canyon component is very
small, readily diagnostic items being limited to a single rectangular-stemmed projectile point (Kidd 1964:11, Fig. 3, b), a form which may be characteristic of the local manifestations of both the Frenchman Springs and Cayuse phases. The stratigraphic position of the component is also such that it could be considered much more recent than 1000 B.C. Therefore, in the absence of corroborative evidence, the age and phase association of this component and the adze which it contains must be considered questionable.

4. Excavations at 450K78, an open site on the northern fringe of the Columbia Plateau, have revealed an early Cayuse Phase component which has been C14 dated to 580 ± 160 B.C. (Grabert 1966:29). The assemblage from this component contains an adze (Grabert 1966: Fig. 13, f), the earliest verified northerly trade item in the Columbia Plateau. Since the Cayuse Phase is thought to have begun four or five centuries later further to the south, the initial appearance of northerly trade items should be expected in late pre-Cayuse Phase components throughout much of the northern Columbia Plateau. Although this tends to obviate possible conflict over Kidd's tentative interpretation of the Hole-in-the-Wall Canyon site, it does not provide confirmation of Kidd's interpretation. [46]

The following observations support the conclusion that the beginning of the Cayuse Phase marks the introduction of several new trade items into the Columbia Plateau and the emergence of a well developed pattern of trade with the Canadian Plateau and the adjacent coasts of northern Washington and southern British Columbia.

1. *Dentalium* trade begins with and is relatively heavy at the beginning of the Cayuse Phase, The evidence for this comes from sites such as 45KT28 (Subcomponent VIIA), 45C01 (C. M. Nelson 1966: Assemblages 4A and 4E), and Wildcat Canyon (Cole and Cressman 1960), where *Dentalia* first appear at the lower boundary of the Cayuse Phase. Although burial practices make it difficult to measure the relative geographic abundance of *Dentalia*, private collections give the impression that it is somewhat more common in the northern Plateau during the first part of the Cayuse Phase. In this regard, it is interesting to note that *Dentalia* were available for trade from the Fraser River basin as early as the first millennium B.C. (Sanger 1966: Lochnore Creek site. Zone I).

2. In the Columbia Plateau, the earliest confirmed occurrences of ground stone and mussel shell (*Mytilus californicus*) adzes date from the first half of the Cayuse Phase.

3. Trade in *Olivella bipplicata* and *Schizotherus nutally* continues but does not appear to increase in volume. In general, *Dentalium* is a more common trade item.

4. Other marine shells, which are unknown from pre-Cayuse Phase components, make their first appearance in the first portion of the Cayuse Phase (e.g., C. M. Nelson 1966:44, *Odostomia tenuisculpta*).

It might be suggested that the apparent increase in coastal trade which occurs at the beginning of the Cayuse Phase is due to the expansion of Chinookan commercial activity up the Columbia River to the vicinity of The Dalles and Wishram. Although the archaeological record does not provide a final answer to this question, the patterns of prehistoric trade, as they are presently understood, do not support this view. If the trade characteristic of the early portion of the Cayuse Phase were simply a product of Chinookan expansion, one would expect an increase in *Olivella* traffic and a high concentration of trade goods in the southern Columbia Plateau. In fact, however, the abundance of *Olivella* does not appear to increase greatly at the beginning of the Cayuse Phase. Moreover, the introduction of *Dentalium* beads in greater concentrations in the northern Columbia Plateau contrasts sharply with the more frequent occurrence of *Olivella* beads in the southern Columbia Plateau and suggests that there are now two separate avenues of coastal trade, one along < the Columbia River in the south and the other through the Canadian Plateau in the north. The Columbia River route represented a continuation of an earlier pattern, while the northerly route represented a new pattern of trading.

As mentioned in the discussion of the Cayuse III Subphase, the vigorous Chinookan trade observable in the early historic period is reflected in the archaeological record and does not begin until the onset of the protohistoric period when the whole trading network of the Plateau was greatly extended.

The Increased Importance of Fishing. Although the archaeological record is more tenuous on this point, the temporal distribution of fish remains and fishing implements seems to indicate that fishing became more important at the beginning of the Cayuse Phase. Since this posited characteristic of the Cayuse Phase is extremely important to the interpretation of the significance of the Cayuse Phase, its discussion will be deferred until the presentation of the Salishan expansion hypothesis. [47]

Patterned Circumperipheral Diffusion in the Columbia Plateau. The emergence of the Cayuse Phase is marked by a curious pattern of diffusion in which projectile point types are locally diffused southward and eastward along the western and southern margins of the Columbia Plateau. Since this phenomenon is important to the understanding of the beginning of the Cayuse Phase, its discussion will be deferred until the presentation of the
Salishan expansion hypothesis.

THE AGE OF THE CAYUSE PHASE

There are a number of available C\textsuperscript{14} dates which allow the beginning of the Cayuse Phase to be fixed between ca. 100 B.C. and 100 A.D. in most parts of the Columbia Plateau. The associations of most have not been published in great detail, so the following discussion will have to be very general in nature.

There is only one C\textsuperscript{14} date of relevance from the northern periphery of the Columbia Plateau: 580 ± 160 B.C. It comes from the bottom of Zone B2 at 450K78 and is associated with a series of house structures (Grabert 1966:29).

Along the western margin of the Columbia Plateau there is a series of four dates from the Vantage locale. (1) There is a date of 235 ± 60 A.D. from a pit house floor at 45GR77 (Dorn et al. 1962:7). It is associated with a typical Cayuse Phase projectile point assemblage. (2) There is a series of three dates which bracket the lower boundary of the Cayuse Phase at Schaake Village, a site just north of Vantage (Fairholt et al., 1966:505). The fill of a house structure has provided a limiting date above the boundary of 430 ±110 A.D. It is associated with local projectile point types characteristic of the Cayuse Phase. Dates of 90 ± 110 B.C. and 830 ± 190 B.C. have been obtained from approximately the same stratigraphic position underlying the Cayuse Phase component. Since the date of 90 B.C. was obtained through the dilution of a small sample, it is probably less reliable than the earlier date even though it is not necessarily inconsistent with the regional evidence.

There are five published dates from the Middle Columbia which are associated with early Cayuse Phase tool assemblages and village sites. (1) There are dates of 85 ± 150 B.C. (Cole and Cressman 1961: Cultural Level 3; Crane and Griffin 1962:199), 160 ± 275 A.D. (Cole 1963:17), and 550 ± 150 A.D. (Cressman and Cole 1962; Trautman 1963:74) in association with house remains at Wildcat Canyon. (2) There is also a date of 80 ± 150 B.C. from the main burial complex at Wildcat Canyon (Crane and Griffin 1962:199). (3) There is a date of 210 ± 175 A.D. in direct association with a house structure at 35GM15 (Cole 1965:19).

There are also five important dates available for the early part of the Cayuse Phase along the Lower Snake. All are associated with projectile point assemblages characteristic of local manifestation of the Cayuse Phase. (1) There is a date of 425 ± 125 A.D. from a house structure at the Harder Site (Kenaston 1966:82). Since the house pit was excavated into earlier Cayuse Phase debris, 425 A.D. is simply a limiting date on the phase's lower boundary. (2) There is a date from 45C01 of 230 ± 165 A.D. (C. M. Nelson 1966). It is associated with a Cayuse Phase tool assemblage but not with structural remains. (3) There is a date of 100 ± 40 A.D. (WSU-129) from Stratum VII, Feature H, at Cave C, Windust Caves (H.S. Rice 1965; 1967: personal communication). Although this date was initially rejected, it is now under review again. It compares very well with other dates from the Lower Snake and other regions of the Columbia Plateau. (4) There are two superposed dates of 810 ± 240 B.C. (WSU-430) and 1193 ± 187 A.D. (WSU-431) from house structures at Three Spring Bar (Daugherty 1967: personal communication). Both dates are associated with Cayuse Phase projectile point types, including Columbia Plateau Corner-Notched projectile points. [48]

Still further to the east, in Idaho, the early Cayuse Phase equivalent is the Rocky Canyon Phase. C\textsuperscript{14} dates in association with house structures suggest that this phase began at approximately 100 B.C. (Butler 1966:125).

With the exception of the earlier dates from 450K78 and Three Spring Bar, the available C\textsuperscript{14} dates suggest that the Cayuse Phase began sometime between 100 B.C. and 100 A.D. However, since most of the dates simply fix an upper limit for this boundary, it is possible that it could have occurred as much as two or three centuries earlier in the southern and western Columbia Plateau. The earlier dates may be explained as follows.

The date of 580 B.C. from 450K78 is substantiated by a date of 1070 ± 150 B.C. from 450K58, a nearby open site. Although the earlier date is not associated with house remains, both dates are associated with similar projectile point types, including a number of specimens which can be considered prototypic of the Columbia Plateau Corner-Notched projectile point (Grabert 1966). These facts suggest that the Cayuse Phase began at least 300 to 600 years earlier on the northernmost fringes of the Columbia Plateau than it did in the western or central Columbia Plateau.

Although substantiation of the early date from 450K78 might first appear to constitute a tentative conformation of the early date from Three Spring Bar, two sets of facts strongly suggest that a date of 810 B.C. for an early Cayuse Phase component in the southern Columbia Plateau is at least five centuries too early.

1. The date does not agree closely with dates for comparable assemblages on the Lower Snake, from the
Middle Columbia, or from the adjacent portion of Idaho. The hiatus of nearly 2,000 years between the two dated houses and an age of approximately 3,000 years for the upper flood plain stratum at the site may also prove inconsistent with regional stratigraphic interpretations.

2. The date is associated with an early Cayuse Phase assemblage which includes Columbia Plateau Corner-Notched projectile points. Comparative evidence suggests that prototypes for such projectile points developed along the northern and northwestern margins of the Plateau in the first and second millennia B.C. (Warren 1959; Grabert 1966), while the oldest probable occurrence of a typical representative of the type comes from the Ellensburg Canyon at the mouth of Umtanum Creek, where stratigraphic evidence suggests that it dates from the first millennium B.C. (D. G. Rice 1969). The type subsequently spread into the Vantage locale at the beginning of the Cayuse Phase at which time it comprised over 70 percent of the stemmed projectile point assemblage. It then diffused southward along the Columbia River and eastward along the Snake River, regions where it is found in far less abundance until later in the Cayuse Phase. This pattern of diffusion is in direct conflict with the early date from Three Springs Bar.

It is possible that the early date from Three Springs Bar is the result of stratigraphic inversion due to the excavation of house pits. In any case, the comparative evidence indicates that it should be regarded with skepticism unless corroborative evidence can be produced.

REGIONAL VARIANTS OF THE CAYUSE PHASE

Introduction. As enumerated above, the beginning of the Cayuse Phase is characterized by the appearance of a number of fundamental innovations, including increased population densities, increased coastal trade, and large site complexes composed of semi-permanent villages, burial areas, rockshelters, and other associated features. These changes appear everywhere at about the same time and permeate the entire Columbia Plateau. [49]

Although one might expect such rapid and widespread changes to be accompanied by a radically new and relatively homogeneous material culture, no such development occurs. In fact, exactly the opposite appears to be true, for only a few archaeologically observable changes occur in the material culture. These changes fall into two basic classes.

1. There is the introduction of totally new items of material culture, apparently limited to a few pieces of fishing gear, such as the composite harpoon and three-pronged salmon spear, and to new items of trade, such as Dentalium beads. In addition, projectile points tend to be somewhat smaller. Other than these innovations, which apparently accompany the appearance of the Cayuse Phase everywhere it occurs, the basic hunting-gathering equipment of earlier phases is retained in toto.

2. While obvious fundamental changes do not occur in the basic technology, typological changes in the morphological forms of many tools do change to widely varying degrees. For example, in the Vantage locale there is an abrupt shift in projectile point types, whereas on the upper portion of the Lower Snake new types of projectile points occur in only small quantities. It is probable that extensive typological changes occur in areas subject to the regional diffusion of local types, while areas of relative typological stasis represent regions in which diffusion was slight or centers from which diffusion was dominantly unidirectional. The regional diffusion of local types in some areas and their retention in other areas has functioned to produce a series of regional geographic variants at the very beginning of the Cayuse Phase. Although the precise limits and interrelationships of such regional geographic variants are still poorly understood, the following centers of regional variation can be outlined tentatively.

The Vantage Locale. The Vantage locale, extending from Priest Rapids northward to Wenatchee, is an area in which the early manifestations of the Cayuse Phase are typologically highly differentiated from the underlying Quilomene Bar Phase. Here the Cayuse Phase is marked by the sudden introduction of the Columbia Plateau Corner-Notched projectile point (Appendix A, Type 6), which at once constitutes 70 to 80 percent of all stemmed and notched projectile points. The Quilomene Bar Base-Notched projectile point (Appendix A, Type 5), the dominant type during the proceeding Quilomene Bar Phase, now occurs in frequencies ranging from 10 to 25 percent. Moreover, only a fraction of such projectile points represent the type variant which was most abundant during the Quilomene Bar Phase. Most of the remaining specimens represent newly developed or introduced variants. In addition, miscellaneous forms generally account for ca. five percent of the stemmed and notched projectile points. The use of a small indentation or notch in the center of projectile point stems is also introduced, flattened bone and antler projectile points first appear (Appendix A, Type 1), and elongate core tools disappear from the record (Appendix A, Type 1). The retention of preexisting local patterns, such as the use of basalt spall scrapers and bifacially flaked crushing implements, and the general absence of other types of flaked cobble tools, also serves to differentiate the Vantage locale from other regional centers of variation in the early Cayuse Phase.
The Middle Columbia. Although the work of Cole (1963; 1965), Cole and Cressman (1961), Cressman (1960), and Cressman and Emmons (1953) makes it clear that the Middle Columbia forms a separate center of geographic variation in the early part of the Cayuse Phase, published analyses are not exhaustive enough to allow a detailed statement of its characteristics. However, it is apparent that Columbia Plateau Corner-Notched projectile points were introduced at the beginning of the Cayuse Phase when they may account for as much as 25 percent of all stemmed and notched projectile points. Antecedent forms carried over into the Cayuse Phase evidently include a wide variety of heavy corner-notched projectile points, including some variants of the Quilomene Bar Base-Notched [50] point (Cressman and Cole 1963). Small, peripherally flaked cobble and pebble choppers are apparently carried over from earlier periods, and help to distinguish the Middle Columbia from neighboring regions. Many other distinguishing features may also exist, but the preliminary nature of the published reports makes it very difficult to generalize.

The Lower Snake. Early Cayuse Phase components known from the down stream section of the Lower Snake River (Kenaston 1966; H. S. Rice 1965: Stratum VII) resemble their counterparts in the Vantage locale and the Middle Columbia Region more than they do components of comparable age from the eastern portion of the Lower Snake. They are dominated by variants of the Quilomene Bar Base-Notched and Columbia Plateau Corner-Notched projectile points which diffused into the Lower Snake from along the adjacent Columbia River. Simple contracting stemmed projectile points and Side-to-Corner-Notched projectile points (Nelson and Rice 1966) occur in small quantities, probably as retentions from the local technology which antedated the Cayuse Phase.

Further to the east, in the upstream portion of the Lower Snake, the early Cayuse introduction of more westerly forms such as the Quilomene Bar Base-Notched and Columbia Plateau Corner-Notched projectile points was more sporadic and earlier projectile point types are retained in higher frequencies (C. M. Nelson 1966; Sprague and Combes 1966; Nelson and Rice 1966).

The retention of cobble spall scrapers and a wide variety of crude flaked cobble tools helps to set the entire Lower Snake Region apart from the rest of the Columbia Plateau.

Idaho. Butler (1962a; 1966:125-128) has constructed a series of phases for that portion of Idaho immediately adjacent to the Columbia Plateau. Here there is a change from the Grave Creek to the Rocky Canyon Phase estimated to have occurred at about 100 B.C. This break is equivalent to the Cayuse-pre-Cayuse boundary in the adjacent Columbia Plateau, the Rocky Canyon Phase possessing the essential characteristics of the Cayuse Phase.

The latter part of the Grave Creek Phase is characterized by Bitterroot Side-Notched projectile points, which are largely replaced by a wide variety of corner-notched projectile points at the beginning of the Rocky Canyon Phase. These points include many specimens which fall into the Side-to-Corner-Notched type which apparently diffused eastward from the adjacent Columbia Plateau at the beginning of the Cayuse Phase. Although not fully published, it is probable that the Rocky Canyon Phase assemblages also contain a very small number of Quilomene Bar Base-Notched and Columbia Plateau Corner-Notched projectile points further documenting diffusion from the eastern margin of the Columbia Plateau. Persistence of features such as the edge-ground cobble, the mano-metate complex, and small numbers of Bitterroot Side-Notched projectile points produce the distinctive character of this region.

Relationship between the Cayuse Phase
and the Ethnographic Pattern

INTRODUCTION

Since the basic patterns established at the beginning of the Cayuse Phase persist until the termination of the archaeological record sometime in the middle of the nineteenth century, it is obvious that there must be some direct relationships between ethnographic patterns of Plateau culture and the archaeological manifestations of the Cayuse Phase. This discussion seeks to define that interrelationship, a necessary step towards understanding both the origin of the Cayuse Phase and [51] the antiquity of ethnographic Plateau culture. If it is found that there is a necessary connection between the primary characteristics of the Cayuse Phase and ethnographic cultural patterns, that the two are synonymous phenomena, then an explanation for their origin must be sought in the factors surrounding the emergence of the Cayuse Phase.

But first the ethnographic pattern must be described. This will be done primarily in terms of settlement patterns and economic organization, phenomena which can be tested for in the archaeological record with relative ease.
THE ETHNOGRAPHIC PATTERN

Ethnographically, population was concentrated much of the year in winter villages situated in the deep valleys at the margin of the Columbia Plateau (Anastasio 1955). The winter villages, which were occupied for approximately five months a year, formed the basis for social units larger than the family and geographically dominated the yearly economic cycle which was designed to supply enough surplus food to support a sedentary existence during the winter months. They were situated along trunk streams and their larger tributaries, and occasionally along the shores of lakes. The specific locations of winter villages were determined by elevation and topography producing favorable climatic conditions, the presence of winter food resources necessary to supplement surpluses of roots and fish, and proximity to food resources customarily utilized in the early spring and late fall.

Although the size and position of winter villages, and the details of land utilization varied with local differences in climate and topography, the geographic distribution of food resources, and the yearly variation in the abundance of these resources (see Anastasio 1955), the general character of the yearly economic cycle is illustrated well by Ray's (1932) description of the Sanpoil and Nespelem, a group located on the northern edge of the Columbia Plateau that was affected less by the protohistoric intrusion of horse culture than surrounding groups.

According to Ray (1932:27-29), the yearly cycle of these people began early in the spring when the winter villages were abandoned for nearby, temporary camps. In the protohistoric period each village contained a number of pit houses, a structural form which was replaced by mat houses that were built almost entirely above ground. Like the winter villages, the temporary spring camps were always set up along the Columbia River. They were occupied for about three weeks during which the men hunted fowl and rabbits, and gathered freshwater mussels, while the women dug early-appearing roots in the vicinity of the river.

This period was followed by a gradual removal to the root digging grounds south of the Columbia. Here small bands, each of a few families, set up temporary camps. The women were constantly occupied with digging and drying roots. For the most part, the men loafed about the camp, gambling and gossiping. Rabbits or antelope were hunted occasionally. During this period the old, ill, and crippled were left along the river, where they were cared for by a few of the able bodied who had remained behind for that purpose.

The summer fishing season began in early May and lasted until the first of September. During this period, salmon were taken in traps operated in streams tributary to the Columbia River. In the fall people dispersed from these camps, traveling as they desired either to the mountains north of the Columbia to gather fall roots and berries and to hunt, or to the fall fisheries along the banks of the Columbia. Those who had traveled to the mountains returned to these fisheries where salmon were taken in seines or speared from canoes. By far the greater number of fish, it should be added, were taken with the trap method during the summer season. [52]

The winter villages were reoccupied in mid-October. Underground pit houses were cleared out or excavated, while roots and dried salmon were placed in permanent storage. Such villages contained 20 to 300 individuals, and averaged a population of 50 or fewer. Villages of 100 to 150 were not uncommon during the early historic period, but may have been a result of the protohistoric intrusion of horse culture. The specific composition of villages varied from year to year as families changed their residence in response to their own economic and social needs.

Although the details of Ray's description of the Sanpoil and Nespelem do not apply to all groups of Plateau Indians, the basic land and resource utilization patterns inherent in the description embody an economic system common to groups throughout the Columbia Plateau prior to the protohistoric influence of Plains culture (see Anastasio 1955; Ray 1939). The basic characteristics of this system are the winter village pattern of settlement and the maintenance of winter villages predominantly through root gathering, salmon fishing, and winter hunting. The relative importance of each of these major food resources varied with its local abundance and its seasonal supply, but each was necessary to the maintenance of the winter village pattern from year to year.

TANGIBLE TRACES OF THE ETHNOGRAPHIC PATTERN IN THE ARCHAEOLOGICAL RECORD

Introduction. What tangible traces would the establishment and year to year maintenance of winter villages leave for archaeologists to find? What is the distribution of such evidence in the archaeological record? Documented below, the answers to these questions indicate that the appearance of the Cayuse Phase marks the emergence of the ethnographic patterns of Plateau culture.

The Characteristics of Winter Villages. Although most Plateau ethnographers have tended to stress the role of the village in political and social organization, the following features of the village itself emerge from an examination of the work of such analysts as Ray (1932; 1936; 1939), Anastasio (1955), and Walker (n.d.).
1. Population tended to be dispersed in small units during the summer and concentrated in villages during the winter. However, high population concentrations occurred sporadically at other times of the year in areas where exceptionally large food supplies naturally occurred. These included natural fisheries such as Celilo Falls and Kettle Falls, and extremely productive root gathering grounds. Such local concentrations of population, common in the historic period, were made possible by the protohistoric introduction of the horse, a means of transportation which allowed food and people to be massed in far higher densities than was possible during prehistoric times. It is therefore highly improbable that local population densities during the fully prehistoric period ever reached those characteristic of the historic and protohistoric periods. Nevertheless, it cannot be doubted that the population was higher and denser at sites where natural resources were particularly abundant.

The same reasoning can be applied to winter villages, many of which contained hundreds of people during the historic period. Such large villages were undoubtedly a result of the ability, made possible by the horse, to concentrate the huge surpluses of roots and fish necessary to support the high local population densities produced by large villages. As is noted in the discussion of the Cayuse III Subphase, archaeological evidence for such large villages first appears in the protohistoric period and is evidently correlated with the introduction of the horse.

Prior to the protohistoric period, population must have been concentrated in relatively small winter villages during the winter months and dispersed over the adjacent territory during the rest of the year, when surpluses were being accumulated for the following winter season. The concentration of population at root gathering grounds was probably infrequent due to difficulties in transporting large surpluses over great distances, but concentrations of local population at particularly productive fishing sites almost certainly must have occurred. This agrees well with the archaeological evidence, for large sites tend to be highly concentrated in valleys where winter villages and fishing sites are ethnographically reported.

2. An obvious feature of winter villages is the construction and maintenance of semi-permanent dwellings. Such dwellings might be semi-subterranean earth lodges, large mat lodges constructed over very shallow pits, or intermediate forms combining fairly deep pits with mat-covered superstructures. The remains of such structures are common features of Cayuse Phase components. They tend to occur in groups as parts of site complexes and are distributed in areas where winter villages were traditionally established.

3. Ethnographic evidence (e.g., Ray 1939; Walker n.d.; Schwede 1966) demonstrates that villages were named, that they were situated in finite geographic localities, and that village membership and rights in the resources intimately associated with villages were allocated in the framework of the kinship system. Like the practice of maintaining semi-permanent dwellings, these features imply village stability through time, a feature which is characteristic of numerous sites and site complexes during the Cayuse Phase. Village stability is also one of the factors which tends to produce complexes of related sites centered around the winter village.

4. Associated burial areas are a natural outcome of the establishment and year to year maintenance of a winter village. This follows from the stability of the village, the long period of occupancy each year, the concentration of population at the village site, and the tendency for a higher death rate during periods of winter hardship. Thus the establishment and maintenance of winter villages explains the basic characteristic of Cayuse Phase site complexes, the association of large open sites, burial areas and house remains.

5. Since the maintenance of a winter village requires the storage of food surpluses, equipment, and the mats and structural members of dwellings, the association of storage shelters and storage pits with Cayuse Phase site complexes is a feature which is easily explained. Such associations are not inevitable, however, since elevated platforms were also widely utilized for storage (Ray 1942:180).

6. Since the winter village geographically dominates the yearly economic round and is the primary site of many important social and religious activities, it is characterized by a nearly complete technological inventory. This is reflected by the highly varied assemblages of artifacts typically associated with sites of any Cayuse Phase site complex.

7. Since winter was one of the most important hunting periods, hunting gear and the faunal remains of deer and elk are well represented at the winter village site. This too is a regular feature of the Cayuse Phase site complex.

Recently the interrelationships between known village areas and recent Cayuse Phase site complexes have been reviewed in some detail for a small section of Nez Perce territory (Nelson and Rice 1966: Appendix A). It was found (1) that archaeologically obvious site complexes did not always correlate precisely with ethnographically reported village areas, and (2) that archaeologically verifiable village areas almost invariably contained the basic elements of the Cayuse Phase site complex. This led to the conclusion that there was a direct relationship between the
winter village pattern and the Cayuse Phase pattern of site complexes even though specific village areas were very difficult to infer from the archaeological data itself. [54]

Relationship between the Ethnographic Pattern and the Cayuse Phase. The age, distribution, and density of house remains and site complexes, and the material culture and faunal remains typically associated with site complexes, indicate that the Cayuse Phase embodies the ethnographic cultural patterns of the Columbia Plateau. Moreover, since site complexes of the type associated with the winter village pattern first appear at the beginning of the Cayuse Phase, the emergence of ethnographic Plateau culture must date from the emergence of the Cayuse Phase.

INTRODUCTION

The hypothesis presented in this section of the report states that the Cayuse Phase was initiated by and is the direct result of the expansion of Salishan communities across the northern Columbia Plateau. The constituent elements of this hypothesis are summarized in the following statements. (1) Archaeological evidence demonstrates that the winter village pattern characteristic of the ethnographically documented Plateau social and economic organization was established at the beginning of the Cayuse Phase. (2) The rapid increase in the numbers, sizes, and densities of sites at the beginning of the Cayuse Phase documents a rapid increase in population coincident with the emergence of the winter village pattern. (3) The introduction of new fishing techniques which allowed more efficient use of riverine resources along the margin of the Columbia Plateau provided the economic basis for the winter village pattern and greater population densities. (4) The introduction of the new economic system is interpreted as evidence for the expansion of Salishan communities across the northern Columbia Plateau, an interpretation which agrees well with archaeological and linguistic evidence. (5) A reasonable model of social relationships between adjacent groups possessing different economic systems can be constructed which explains how Salishan communities could have expanded across the northern Columbia Plateau by means of linguistic and cultural diffusion in a particular type of acculturative situation, an interpretation which can account for both the continuities between the Cayuse and pre-Cayuse phases and the changes involved in the emergence of the winter village pattern.

As the previous discussion of the characteristics of the Cayuse Phase indicates, the propositions that the emergence of the winter village pattern and an increase in population size occur at the beginning of the Cayuse Phase are reasonably well established inferences from the archaeological record. It will be necessary, however, to deal more specifically with changes in economic organization which might have made these two events possible.

CHANGES IN ECONOMIC ORGANIZATION COINCIDENT WITH THE EMERGENCE OF THE WINTER VILLAGE PATTERN

Introduction. Since the emergence of the winter village pattern involved the maintenance of larger and denser populations, it follows that there must have been a change in the economic organization to support these increased populations. This change should be reflected both in the organization of the economic round and the kinds and quantities of food resources utilized.

The Cayuse Phase was characterized by the intense utilization of root crops, fish, and large game animals such as deer and elk. Roots and fish were accumulated in large quantities in order to provide the surplus food supplies necessary to maintain villages and high population densities during the winter months. During the winter, the major hunting season when other resources were not available, deer and elk were important sources of food, especially when stored surpluses were not large enough to maintain winter villages. [55]

Since winter villages were made possible primarily by the storage of roots and fish, it follows that the emergence of the winter village pattern must have involved an increase in the effective availability of roots and/or fish. This might have come about through a natural increase in their supply or the introduction of techniques which allowed the more efficient exploitation of existing supplies. Since no natural phenomena are known to have occurred at the beginning of the Cayuse Phase which could have produced a significant increase in the supply of roots or fish, it is probable that the emergence of the winter village pattern was contingent upon the introduction of more efficient techniques of root gathering and/or fishing.

Utilization of Roots. Since root gathering was one of the basic means by which the surplus food necessary to maintain winter villages was accumulated, it is reasonable to assume that the utilization of roots was extremely important throughout the Cayuse Phase. However, the degree to which roots were utilized prior to the emergence of the winter village pattern can be inferred only by a direct comparison between the archaeological records of the Cayuse Phase with pre-Cayuse phases. If it is found that the archaeological evidence for root utilization is essentially
the same in both periods, then it is probable that intensive root gathering was simply one of those features which was a basic Plateau characteristic retained in the newly emerging context of the winter village pattern. On the other hand, if the equipment and features normally associated with root gathering are especially important in the Cayuse Phase, then it is probable that innovations in the utilization of root crops were important factors in the emergence of the winter village pattern.

Direct archaeological information about the age and significance of root gathering is limited to the known distribution of hopper mortars, pestles, digging stick handles, and earth ovens which may have served as roasting pits. Hopper mortars and pestles were introduced during the Cold Springs Phase and are common in all successive phases. Thus, the mortar and pestle, basic implements in the preparation of edible roots, were introduced or developed in the Columbia Plateau between 4000 B.C. and 4500 B.C., at least 2,000 years prior to the beginning of the Cayuse Phase and the emergence of the winter village pattern. Hammerstones having pestle-like platforms also became common at about the time pestles were introduced.

Earth ovens are also common in components antedating the beginning of the Cayuse Phase, but since they were also used for roasting meat and fresh water mussels, they are not always useful guides to the importance of root gathering. However, it is significant that many such earth ovens lack the faunal associations expectable if they had been utilized for roasting meat or mussels. Moreover, the existence of an elaborate Frenchman Springs Phase roasting pit with associated hopper mortars indicates that this technique for the preparation of roots was highly developed at least 1,000 years prior to the beginning of the Cayuse Phase (see Daugherty 1952: 45GR27, Feature 1).

Although perforated antler and grooved stone digging stick handles are known only from Cayuse Phase components, they are not common and may have been overlooked in earlier phases due to inadequate sampling. Moreover, an antler digging stick has been recovered from a Cold Springs Phase component (C. M. Nelson 1966). This indicates that digging sticks were utilized at least as long ago as ca. 4000 B.C.

The use of manos and metates is also recorded for the Cold Springs Phase (C. M. Nelson 1966) and are characteristic of both the Grave Creek and Rocky Canyon phases in west-central Idaho (Butler 1966). Moreover, though Butler's equation between edge-ground cobbles and root processing is difficult to demonstrate, it indicates the possible importance of root gathering for several millennia prior to the Cold Springs Phase. [56]

The existence of pestles, hopper mortars, digging sticks, and root-roasting pits prior to the beginning of the Cayuse Phase demonstrates that the basic technology of root gathering was fully developed millennia before the emergence of the winter village pattern.

Salmon Fishing. Information about fishing may be obtained from the distribution of fish remains and fishing implements. In general, both are infrequent in pre-Cayuse components and common in Cayuse components.

Salmon and other fish bones usually account for 0 to 2.0 percent by number of all bones present in floodplain components antedating the emergence of the Cayuse Phase; notable exceptions are the early fishery at Five Mile Rapids (Cressman 1960) and the Cold Springs Phase component at Cold Springs (Shiner 1961). Unfortunately, data from Cold Springs is difficult to reliably interpret due to stratigraphic inversions created by rodents and the erection of pit houses. Elsewhere fish remains are infrequent or absent.

The floodplain components representative of the Cayuse Phase commonly contain 2.0 to 35.0 percent (by number) salmon bones. The average is about 10.0 percent in most areas of the Columbia Plateau.

Although there is a substantial increase in the frequency of fish remains and features associated with such remains at the beginning of the Cayuse Phase, deer bones tend to be more abundant at winter village sites. This is due to a combination of factors. First, winter was the primary period of hunting. Since carcasses were often transported to the winter villages intact, it is not surprising that deer bone is abundant in the archaeological record. Second, fish were most commonly prepared for drying by filleting the flesh from the bones, which were then discarded. Since fishing was conducted at low water and the fish were filleted in areas that were frequently inundated at high water, countless fish bones would normally never find their way into site middens. This may help to explain the high concentration of fish remains in the early component at Five Mile Rapids where the beach zone of the site was occupied (Cressman 1960). It is also significant that fish remains are infrequent at other pre-Cayuse beach zone components such as those at 45KT28 and 45CO1 (C. M. Nelson 1966). Third, it is known that some Plateau groups ethnohistorically practiced food taboos and other rituals that selectively destroyed salmon bones (Ray 1932; 1942). And fourth, a great deal of the fishing was not conducted at winter village sites. For these reasons, fish remains recovered from floodplain sites represent only a small fraction of the fish that were actually taken and consumed.

Although the increase in fish remains at the beginning of the Cayuse Phase may be symptomatic evidence of
the greater importance of fishing, a variety of practices make it difficult to interpret with certainty.

Like fish remains, fishing implements are rare in pre-Cayuse and common in Cayuse components. Reports of pre-Cayuse fishing implements are limited to Five Mile Rapids (Cressman 1960), Cold Springs (Shiner 1961), and 45CO1 (C. M. Nelson 1966). Identified fishing implements from Five Mile Rapids include a composite harpoon valve fragment and a barbed leister prong (Cressman 1960: Fig. 20). The identification of the composite harpoon valve is questionable since the specimen might also be identified as an atlatl spur fragment. Fishing implements from Cold Springs include notched weights and a large grooved weight. Although these specimens are thought to be associated with the Cold Springs Phase component (Shiner 1961), complicated stratigraphy and more recent house building and occupancy at the site make it difficult to interpret these specimens without corroborative evidence from other Cold Springs Phase components. Assemblages from known Cold Springs components, including a large and diverse collection from a site at the [57] junction of the Snake and Tucannon Rivers (C. M. Nelson 1966), do not contain notched or grooved weights (also see Holmes: 1964, Occupations B and C; H. S. Rice 1965).

Early fishing implements from 45CO1 include a net shuttle and two possible net gauges, all recovered from a component dating between 2,000 and 3,500 B.P. (C. M. Nelson 1966: Assemblage 3C). Although these specimens demonstrate that nets were being made, there is no way of showing that the nets were utilized in fishing since birds and other animals may have been hunted with such devices (see Ray 1942:120).

Cayuse Phase components contain notched, perforated, and grooved weights, net gauges and shuttles, composite harpoon tips and valves, three-pronged salmon spear barbs and barb guards, unilaterally barbed stone projectile points, carvings depicting fish, and other implements commonly associated with fishing. Moreover, these artifacts are extremely common in spite of the fact that most of our knowledge comes from winter villages where only a small portion of the yearly fishing was conducted.

This evidence suggests that there was some increase in the importance of fishing at the beginning of the Cayuse Phase, but it is impossible to ascertain the relative importance of this increase by the use of archaeological data alone. As previously stated, however, the fundamental association of the winter village pattern with the most basic economic patterns and techniques of ethnographic Plateau culture enables the extension of these features to that part of the prehistoric record in which the winter village pattern is a primary characteristic. In theory, then, it should be possible to extend fishing techniques most important to the accumulation of surpluses needed for maintaining winter villages as far back in the prehistoric record as winter villages themselves, that is to the beginning of the Cayuse Phase.

Although a very wide range of fishing devices and techniques were ethnographically utilized in the Columbia Plateau (Ray 1942), the dip net together with a variety of weirs and traps seem to have been the most important technological elements in producing large surpluses of salmon. Although there is no way of testing for dip nets in the archaeological record, it is interesting to note that salmon spears and composite harpoons, which first appear at the beginning of the Cayuse Phase, are closely associated with the use of many traps and weirs.

For these reasons it seems reasonable to infer that the increase of fish remains and the increase and introduction of fishing implements at the beginning of the Cayuse Phase are symptomatic of a more basic revolution in the fishing technology. Such a conclusion is also quite reasonable in view of the fact that root gathering technology did not change at the beginning of the Cayuse Phase. If this indicates, as it seems to, that the use of roots did not dramatically change at the beginning of the winter village pattern, then it is logical to suppose there must have been a fundamental change in the fishing technology which provided the economic basis for the greater population densities characteristic of the Cayuse Phase.

A Model of Economic Change at the Beginning of the Cayuse Phase. Assuming that the emergence of the winter village pattern was predicated on the more efficient utilization of fishing, the following model may be used to reconstruct changes in economic organization.

The carrying capacity of any environment is determined by the effective scarcity of vital commodities. In and adjacent to the Columbia Plateau the effective scarcity of food occurred during the winter when stored provisions and the productivity of winter hunting directly limited population size and density. Taking into account the human maturation period, infant mortality, and life expectancy in societies such as those characteristic of the Columbia Plateau, it is probable that the [58] severest scarcities of food in any given period of 10 or 20 years would serve to create and maintain the human carrying capacity of the Columbia Plateau and surrounding areas.

Prior to the introduction of extremely efficient fishing techniques at the beginning of the Cayuse Phase, the carrying capacity would have been determined by the partial failure of roots resulting in inadequate winter surpluses,
and the scarcity of game during the winter months. The periodic failure of either of these resources would have been enough to severely limit population size and density. The net effect of such an economic system, based on only two major resources which could be influenced by climatic fluctuations and over utilization, would be the maintenance of low population densities in areas which would support much larger populations in the presence of more stable conditions. As a result resources would not be fully utilized in years of plenty and heavily taxed at times of shortage.

The addition of salmon as a major food resource at the beginning of the Cayuse Phase would allow larger populations and higher population densities to be maintained by stabilizing the economic basis for accumulating winter surpluses. Since salmon runs are cyclical and little effected by the local environments along the periphery of the Columbia Plateau, they represent a highly stable and easily predictable food supply. Moreover, since salmon are not tied to the climatic fluctuations which might simultaneously effect the supplies of roots and game, their addition as a major food resource would mitigate the probabilities of periods of extreme effective scarcity and allow roots and game to be utilized more efficiently.

The net result of the introduction of salmon and the creation of a tripartite economic system was the more efficient and conservative utilization of roots and game, and the addition of another major resource. This in turn permitted higher population densities to be maintained during periods of effective scarcity.

This seems to be a reasonable model of change given the archaeological evidence pertaining to root gathering and fishing, but it would be far more secure if some precise ecological information were only available on important edible roots such as camas and kouse. For example, it is not known how early winters, spring frosts, or intensive utilization affected the seasonal distribution of such plants. If roots were never scarce or could never be depleted one could reasonably expect that winter villages might be based on surpluses of them alone. But the simple fact is that in the ethnographic period roots were not sufficient or not used as the sole source of winter food surpluses. Moreover, the utilization of roots is known to have been important thousands of years before winter villages first emerged in the Columbia Plateau. Thus we are forced to the conclusion that the model offered above is the most likely representation of history even in the absence of ecological data demonstrating that effective scarcity of roots was a real possibility.

CHANGES IN SOCIAL ORGANIZATION COINCIDENT WITH THE EMERGENCE OF THE WINTER VILLAGE PATTERN

It is always tempting to speculate on the relationship between social organization and changes in the prehistoric record. This is usually an extremely difficult task, especially when it must be conducted in conceptual frameworks designed by social and cultural anthropologists with little regard for applicability to archaeological data. Nevertheless, something can be said about social structure from the standpoint of the framework of terms recently developed primarily on the basis of archaeological data (Beardsley et al, 1956).

In this framework of community patterning, the pre-Cayuse settlement patterning of small, highly dispersed, seasonal camps reflects a simple restricted wandering community patterning, probably in association with small bands which were not integrated into more complex social units.

On the other hand, the development of the winter village pattern, in which winter villages served as hubs dominating the yearly economic round, clearly marks the emergence of what Beardsley terms a centrally based wandering community patterning. As Ray's (1939) discussion of Plateau social structure indicates, this type of patterning was associated with a variety of social structures ranging from independent villages equivalent to simple bands to incipient tribal organizations reminiscent of Plains culture. Since the most complex of these structures were diffused into the Plateau from the Plains in the protohistoric period, it is probable that the emergence of the winter village simply saw the creation of larger settled bands or the organization of small numbers of geographically associated villages into somewhat larger social units. However, these conclusions must remain highly provisional, pending archaeological and ethnographic research.

THE EXPANSION OF SALISHAN COMMUNITIES ACROSS THE NORTHERN COLUMBIA PLATEAU

Introduction. Although the gradual establishment of the fishing techniques mentioned above might be considered sufficient cause for the emergence of the Cayuse Phase, their sudden appearance argues for processes such as rapid diffusion, acculturation, or migration. The following points are offered in support of the hypothesis that the riverine bias and the winter village pattern, introduced at the beginning of the Cayuse Phase, document the expansion of Salishan communities along the western and northern margins of the Columbia Plateau.

Community Patterning. The winter village pattern which characterizes the Cayuse Phase also exists in the Canadian Plateau where preliminary archaeological research suggests that it may date from a period between 1000 and 2000 B.C. (Sanger 1963; 1966). On the northern fringe of the Columbia Plateau the earliest dated occurrence
attributable to such a pattern dates from approximately 500 B.C. (Grabert 1966). In the rest of the Columbia Plateau C\textsuperscript{14} dates place the introduction of the winter village pattern between 100 B.C. and 100 A.D. At the very least, these dates suggest that the winter village pattern diffused from the Canadian Plateau into the Columbia Plateau.

**Coastal Trade.** As previous discussions have indicated, extensive trade with the Canadian Plateau was probably established at the beginning of the Cayuse Phase. This suggests that a new trade route was established as the winter village pattern diffused into the Columbia Plateau.

**Fishing Technology.** Work in western Washington (Greengo 1966; C. M. Nelson 1962b; Nordquist 1960, 1961a, 1961b, 1963), the Fraser River delta (Borden 1962), and the Fraser River basin (Borden 1962; Sanger 1966) reveal well developed riverine fishing economies capable of providing the necessary technology for producing winter surpluses of fish in the winter village pattern. There is every reason to suspect that such fishing techniques diffused into the Columbia Plateau along with the winter village pattern itself.

**Linguistic Evidence.** Linguistic evidence (Swadesh 1949, 1950, 1952; Suttles and Elmendorf 1962) suggests that Salishan languages spread into the northern Columbia Plateau from the northwest to the southeast. More recently, Elmendorf (1965) has provided a tentative chronology for Salishan expansion on the basis of glottochronologic dates. He places the initial expansion of Salishan southward into the Okanagan Highlands at approximately 1000 B.C. with subsequent expansion across the northern part of the Columbia Plateau continuing until perhaps as late as 1000 A.D. Elmendorf uses the dated spread of forests during the Medithermal to substantiate his chronology, the assumption being that the Siash language and a forested environment are ecologically linked.

Although dates for the spread of the winter village pattern agree reasonably well with Elmendorf’s proposed chronology for Salishan expansion, it is doubtful that Salishan expansion is functionally related to the onset of the Medithermal. Elmendorf relies on Heusser (1960) for his climatic statements and Heusser relies primarily on Hansen (1947; 1955), whose work in south and central British Columbia clearly indicates that there was a Ponderosa pine forest present during the Altithermal and that it was simply replaced by another forest type during the Medithermal. Since one would expect game to be plentiful under these conditions and since salmon runs were apparently not effected by the onset of the Medithermal, it is highly unlikely that climatic changes can be invoked as causative agents in Salishan expansion.

**A MODEL OF THE EXPANSION OF SALISHAN COMMUNITIES ACROSS THE NORTHERN MARGIN OF THE COLUMBIA PLATEAU**

If it is assumed that pre-Cayuse Salishan groups in the areas adjacent to the northwestern margins of the Columbia Plateau possessed all the essential features of the winter village pattern and Cayuse fishing techniques, and that adjacent groups occupying the margins of the Columbia Plateau possessed simpler economic and social systems, the following sequence of events can be constructed which explains the emergence of the Cayuse Phase.

1. Because the Salishan groups operated under an economic system in which salmon was heavily utilized, it would be possible for them to use the fishing resources of neighboring groups that did not operate specialized fishing sites or rely heavily on salmon as a food resource. Although this utilization of neighboring territory would not directly jeopardize the customary economic rights of the non-Salishan group, it would create a dialog between the two groups and expose the non-Salishan group to new and revolutionary fishing techniques, and to the winter village pattern.

2. When periods of food scarcity demonstrated the advantages of the new impinging economic system to the non-Salishan bands, they would begin adopting the new fishing techniques. However, this would be difficult since the best fishing stations in their own territory would already be occupied by the adjacent Salishan bands. In order to reconsolidate the economic rights to their own territory and take advantage of the more efficient economic system of their Salishan neighbors, non-Salishan band members would begin marrying into the Salishan bands.

3. However, intermarriage would only have the effect of extending the Salishan group's economic rights over the territory of the adjacent non-Salishan band as the larger winter villages gradually absorbed the non-Salishan population.

4. As long as the predominant language spoken by the winter village groups remained Salishan, that language would spread as the new economic and social system invaded new geographic areas. In this way linguistic and cultural boundaries would be pushed east and south while little actual population movement occurred.

5. The expansion of Salishan communities would be limited by the distribution of unutilized supplies of salmon and social structures which were easily broken down by the impinging winter village pattern. The Columbia Plateau would therefore be the ecological barrier to the southward expansion of Salishan communities and explains
the distribution of the interior Saiish in the northern Plateau. But Salishan also failed to expand southward along the eastern foothills of the Cascade Mountains despite the existence of good salmon fisheries. Since the winter village pattern did spread [61] to groups in this area and was subsequently adopted by groups along the southern margin of the Columbia Plateau, it is probable that social or economic factors prevented a Salishan expansion into this territory. Though the exact nature of such factors cannot be specified at this time, any condition which would favor the diffusion of techniques and ideas more than the diffusion of the economic rights in adjoining territories would have provided the means by which Salishan expansion could have been inhibited. In this regard it is interesting to note Jacob's (1937) remark that Sahaptin was expanding northward at the expense of Salishan during the protohistoric period. This is probably related to the greater impact which the horse and Plains culture had in the southern and eastern Plateau. And while it indicates that Salishan may have once been distributed slightly further to the south, it does not explain the distribution of the winter village pattern in the southeastern section of the Columbia Plateau.

The model presented above is not designed to be a necessary representative of historical truth. It is designed to show how Salishan could have spread into the Columbia Plateau in the absence of actual migration. Although simpler, a migration model cannot account for the continuity which exists in the material culture between the Cayuse and pre-Cayuse periods or for the peculiar pattern of circumperipheral diffusion along the western and southern margins of the Columbia Plateau.

It has been pointed out several times that the archaeologically observable material culture does not undergo any obvious radical transformation at the beginning of the Cayuse Phase when the winter village pattern was introduced. This is consistent with the model outlined above since the spread of the winter village pattern only involves the necessary diffusion of those technological assemblages, tools, and morphological types that are required for producing the necessary winter surpluses. Since the winter village pattern could be built to a large degree upon older Plateau patterns of hunting and root gathering, the technological assemblages associated with these activities did not change as fishing gear and winter villages diffused across the Columbia Plateau.

If migration had occurred on a large scale, the entire technology, including the typological attributes of the migrating group, would have invaded the Columbia Plateau. That this did not happen can be seen even more clearly when the patterns of regional diffusion at the beginning of the Cayuse Phase are considered. The Columbia Plateau Corner-Notched projectile point was evidently developed just to the west of the Columbia Plateau and diffused eastward into the Vantage locale in great abundance at the beginning of the Cayuse Phase. But diffusion of this projectile point type was less effective further to the south on the Middle Columbia, where it was common but not a dominant type. The early diffusion of the type along the southern margin of the Columbia Plateau was still less spectacular and its introduction into the easternmost portions of the Columbia Plateau was very spotty.

Quilomene Bar Base-Notched projectile points were extremely common in the Vantage locale and, to a lesser extent, along the Middle Columbia, when the winter village pattern diffused into these areas. Locally this type became much less common, but it was diffused eastward into the lower section of the Lower Snake where it had not existed previously.

Side-to-Corner-Notched projectile points were extremely common along the Lower Snake River at the time the winter village pattern diffused through the area. They were diffused eastward into Idaho where they [had not] existed previously.

This pattern of local west to east diffusion is understandable in terms of the larger diffusion model offered above, but it is not the result of migration since none of the point types involved existed in the Canadian Plateau prior to the beginning of the Cayuse Phase. [62]

ALTERNATE HYPOTHESES

The only published alternative to the Salishan expansion hypothesis is Daugherty's (1962) Intermontane Western Tradition hypothesis which sees the Cayuse Phase, or Late period, as the culmination of gradual internal development within the Columbia Plateau. As has been stressed repeatedly, if the presence and absence of traits are simply tabulated in the archaeological record, then no great change will be apparent at the beginning of the Cayuse Phase. But if the traits are considered in terms of the configurations that they form and the contexts in which they
occur, then the transition to the Cayuse Phase cannot be described as gradual.

**SUMMATION**

The Salishan expansion hypothesis has been developed and presented in order to stimulate more meaningful research in Plateau archaeology and to show that it is possible for archaeologists to reconstruct cultures and sequences of cultural change at a level of sophistication substantially higher than the simple description of archaeological sequences based on tool types and decorative motifs. Archaeological work in the areas marginal to the Columbia Plateau and a close inspection of the ethnographic evidence should allow a substantially more detailed version of this hypothesis to be proposed and tested.

Two papers have recently been published which have a direct bearing on the interpretation of the Cayuse Phase. The first of the represents the culmination of Grabert's work in the Okanogan (Grabert 1968). This monograph presents in greater detail the evidence reviewed in brief in earlier interim reports (Grabert 1966) and so does not alter the fundamental interpretations in this section of the report.

The second paper of note is an article by David Sanger (1967) in which it is suggested that the Cascade Landslide (Hodge 1938), which created the Lake of the Gods around 1265 A.D. (Lawerence and Lawerence 1958), may have lowered the gradient of the Columbia River sufficiently to allow the passage of salmon whose runs were previously limited to downstream sections of the basin. If this were true the late emergence of sophisticated fishing techniques throughout the Columbia Plateau and in peripheral areas to the east and north would in part be a function of the late availability of salmon. The distribution of salmon remains in the Okanagon (Grabert 1966; 1968), and at 45KT28, Wakemap Mound (Caldwell 1956; Butler 1958a), and Wildcat Canyon (Cole 1964; 1965) do not support this interpretation. An unpublished study by the author of the fauna! remains at 45C01, at the junction of the Tucannon and Snake rivers, has revealed remains of salmon and/or steelhead in Assemblages 2, 3, and 4 (see C, M, Nelson 1966). Thus the Cascade Landslide does not seem to have altered the presence of migrating fish in either the Snake or Columbia river systems.

Stratigraphic Relationships within Cultural Component VII

Because the subphase identifications can be no more accurate than the subcomponent sequence on which they are based, it is essential that the stratigraphic relationships between these subcomponents be thoroughly discussed.

At 45KT28 the Cayuse Phase is synonymous with Cultural Component VII which in turn is coextensive with Stratum 5. Within this component, in which repeated aboriginal house building has disturbed much of the original internal stratigraphy, a reliable sequence of subcomponents could only be provided by a series of major site features, such as house floors, which could be interrelated through stratigraphic or typologic analysis. This presented a particularly difficult problem because such features were unusually widely separated and therefore not directly relatable by the usual stratigraphic methods.

A solution to this problem was provided by the House Pit 15 excavations in which five features of major importance were encountered in close stratigraphic proximity. Stratigraphic relationships between these features are depicted in Figure 19. The earliest of the features was evidently a repeatedly used earth oven and refuse pile with clear lithologic boundaries. It came to be designated Subcomponent VIIA (see Figs. 5, 18, 19, 20, 21).

Two pit houses were intruded into Subcomponent VIIA and have been designated Subcomponents VIIB and VIIC (see Figs. 5, 18, 19, 20, 21, 22). Each of these pit houses possessed an encircling interior bench and a flat, central floor area, with other features such as outline and hearth areas differing in minor details. Although the precise stratigraphic relationships between these subcomponents is somewhat vague, such clues as over-all depth, house design, and associated artifact assemblages suggest that they are of the same relative age, Subcomponent VIIB probably being slightly older.

After a considerable amount of fill had accumulated in the depressions which were left by Subcomponents...
VIIB and VIIC, new pit houses of a different type were excavated into them. These possessed straight side walls and level floors. The earliest, which came to be designated Subcomponent VIIF, was excavated into the depression of Subcomponent VIIB (see Figs. 5, 18, 19, 20). The depression which it left was later partially filled by the subsequent excavation of Subcomponent VIIF (see Figs. 5, 18, 19, 21, 22), the pit house which was intruded into Subcomponent VIIC. [Field crews from the University of Washington encountered an identical situation in their excavations at 45KT28. A late house pit, evidently saucer-shaped, was found superimposed on an early-stepped house pit (American Antiquity 1962: Notes and News, 28:266).]

When the artifact assemblages from these subcomponents were studied, it was discovered that the only apparent significant change had occurred between Subcomponents VIIF and VIIH. This change was defined principally by point types which remained stable throughout the earlier subcomponents but changed dramatically in Subcomponent VIIH. This change appeared at first to be somewhat anomalous because it did not coincide with a change in house types. However, with the extension of the House Pit 15 sequence it was shown to be an accurate observation and has proven historically reasonable in the light of known history and ethnography.

Based on this overlapping sequence of house types and projectile point types, three periods were established as operative units designed to correlate the other house features at the site. Later these proved to represent the three subphases of the Cayuse Phase. The Cayuse I Subphase was defined by the presence of houses with interior benches in primary association with point Types 5 and 6. Subcomponents VIIB, VIIC, and VIIH fell into this category in House Pit 15 excavations. Elsewhere at the site the only other Cayuse I subcomponent proved to be House Pit 7 which possessed a series of interior benches; it came to be designated Subcomponent VIID.

In the House Pit 15 excavations the second period, or Cayuse II Subphase, was represented by Subcomponent VIIF, a straight-walled pit house with an interior bench but containing artifacts much like subcomponents of the Cayuse I Subphase. Elsewhere at the site only one other major feature, House Pit I, provided a similar subcomponent, and it was designated VUG. Subcomponent VIIE, which the reader may have noticed was skipped, designates a refuse surface overlying Subcomponent VIID. Unfortunately there is not enough data to evaluate its sequential position with respect to any subcomponent except VIID. [64]

The third period, or Cayuse III Subphase, was represented in the House Pit 15 excavations by Subcomponent VIIH, where the introduction of several new point types defined a very clear break. House Pit 12 contained these point types in equally high relative numbers and, in addition, still more new point and knife types. This suggested that it was slightly more recent than Subcomponent VHH, and it was designated Subcomponent VII-I.

Two other house pits (numbers 5 and 10) were tested and revealed a third type of pit house characterized by a circular outline and saucer-like floor with gradually sloping side walls. The fill in these house pits was only eight inches deep in the central area of the depressions and characterized by a very black, greasy-filling midden flecked with minute white spots, apparently organic in origin. The lip was still mounded around large sections of House Pit 10, the larger and deeper of the two tested. Although no diagnostic artifacts were recovered from these subcomponents, the freshness of the structural remains and house type distributions along the Upper Columbia suggest that they represent the last or nearly the last occupation of the site, probably in early historic times. They were designated Subcomponents VIIJ and VIIK.

The final subcomponent designation, VIIL, was assigned to the artifact assemblage from the top six inches of Stratum 5 wherever it was tested at the site. This was the only arbitrary unit level that could be assumed to be relatively undisturbed by pit house and storage pit excavation. Though it undoubtedly varied in age from place to place through the site, artifacts recovered from it consistently indicate that Subcomponent VIII may be reliably assigned to the Cayuse III Subphase.

In addition, House Pit 28 was tested but yielded inconclusive results. House limits were very poorly defined by the stratigraphy; the floor could only be defined by the distribution of flaking detritus which suggests that it was either a benched pit house or a circular, flat-floored pit house. Because it cannot be assigned to a particular Cayuse subphase and because there was only one artifact (a spatulate scraper) in the fill above the house floor, this feature
was not assigned a subcomponent designation.

The letters which have been attached to the various subcomponents record no absolute sequence of events, but rather approximate such a system to varying degrees. Subcomponent VIIA is almost certainly the earliest, VIID being the only subcomponent possibly as old or older. Subcomponents VIIB through VIID cannot be ranked among themselves but are definitely of greater antiquity than Subcomponents VIIF and VIIG, and younger (with the possible exception of VIID) than VIIA. Similarly, although their ages relative to one another cannot be absolutely established, Subcomponents VIIF and VIIG are demonstrably younger than Subcomponents VIIA through VIID and demonstrably older than Subcomponents VIIH through VIII. Subcomponent VIIH is slightly older than VII-I, and Subcomponents VIIJ and VIIK are probably virtually contemporaneous with one another, although younger than Subcomponent VII-I. Finally, Subcomponent VIIIL embraces the entire Cayuse III Subphase.

Within the tolerance limits established above, any particular sequence might have been chosen without changing the results of the analysis of Cultural Component VII. Where such choices were exercised they represent hunches of the author and admittedly may be incorrect.

Artifacts from Undesignated Areas in Cultural Component VII

A large portion of the excavations in Stratum 5 lay outside the designated subcomponents. Because of extensive aboriginal disturbance in these areas, the artifacts from them can only be incorporated into the subcomponent sequence in a crude and often problematical manner. Other artifacts were encountered on the margins of subcomponents where the stratigraphy was not completely clear-cut and have also been termed “undesignated.” Undesignated specimens account for approximately 25 percent of the total assemblage from Cultural Component VII.

The following is a complete catalogue of such specimens. The probable positions which many occupy in the sequence of subcomponents have been estimated with greater or lesser degrees of specificity and are recorded in the appendix on material culture. Where estimates are not given, the artifact may occupy virtually any position in the sequence.

Catalogue of Undesignated Artifacts from Cultural Component VII

Chipped stone artifacts (788)

Stemmed projectile points (111)

Type 5 (8)

(1) Type Variant 5A (Fig. 38, a)
(2) Type Variant 5B (Fig. 38, g, i)
(2) Type Variant 5C
(2) Type Variant 5D (Fig. 38, j)
(1) Miscellaneous specimens (Fig. 38, r)

Type 6 (87)

(16) Type Variant 6A
(5) Type Variant 6B (Fig. 39, p, r)
(15) Type Variant 6C (Fig. 39, l, o)
(2) Type Variant 6D (Fig. 39, aa)
(12) Type Variant 6E
(1) Type Variant 6F
(31) Miscellaneous specimens (Fig. 39, jj)
(5) Specimens in the process of being manufactured

Type 8(6)

(1) Type Variant 8A
(1) Type Variant 8B
(2) Type Variant 8D (Fig. 41, h)
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<th>Example</th>
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<td>8G</td>
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<td>10C</td>
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<td>Fig. 41, gg</td>
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</table>
(33) Style 1 (Fig. 58, c)
(6) Style 2
(9) Style 3 (Fig. 56, i)
(3) Style 4 (Fig. 56, l)
(27) Fragments of end and side scrapers
(38) Fragments of other scrapers
Gravers (7)
(7) Type 1 (Fig. 59, d)
(2) Drills and awls (Fig. 59, p)
(1) Chisel
(1) Bifacially flaked hand tool (Fig. 60)
(3) Possible blades (Fig. 61, f, h)
(205) Utilized flakes (Fig. 63, b, e)
(23) Basalt spall scrapers (Fig. 64, b, h, j)
(5) Miscellaneous flaked cobble tools (Fig. 66, e)
Stone tools of percussion (15)
(1) Pestle
Hammerstones (9)
(2) Style 1 [67]
(4) Style 2 (Fig. 68, e)
(3) Style 3 (Fig. 68, b)
Crushing implements (5)
(5) Style 1 (Fig. 70, a-d)
(1) Notched net weight
(1) Pipe
(1) Incised tablet (Fig. 75. a)
(1) Ground concretion disc (Fig. 74, z)
(1) Ocher pallet
(2) Yellow ocher
(5) Red ocher
(2) Diatomaceous earth
Bone and antler artifacts (101)
Awls(23)
(11) Type 1 (Fig. 76, g)
(4) Type 2 (Fig. 78, a, c, j)
(3) Type 3 (Fig. 79, j)
(1) Form 1 (Fig. 81, a)
(4) Awl fragments
(1) Pin or needle (Fig. 82, d)
Composite harpoon tips or barbs of three-pronged fish spears (4)
(3) Type 1 (Fig. 85, r-s)
(l) Form 1 (Fig. 85, o)
Projectile points (1)
(1) Type 1
(1) Digging stick handle (Fig. 87, a)
(1) Spatulate scraper
(1) Fleshing implement (?)
(1) Splinter scraper or flesher
Pressure flaking tools (12)
The Cayuse I Subphase was inaugurated in the Vantage locale at about the beginning of the Christian Era. Characterized by pit houses with interior benches, the exact date of its termination is not now known but reasonable estimates range all the way from 600 to 1300 A.D.

SUBCOMPONENT VIIA

Stratigraphy. Probably the earliest identifiable Cayuse I subcomponent at 45KT28, VIIA is a massive fire pit and refuse heap complex which forms the bottommost lithologic unit of Stratum 5 in the central area of the House Pit 15 excavations (Figs. 5, 6, 18, 19, 20, 22). Originally occupying a more extensive area, it has been intruded by two benched pit houses. Subcomponents VIIB and VIIC (Figs. 18, 19). The area of its greatest concentration has been outlined in Figure 19. Here it varied from 18 to 24 inches in thickness and was composed of a solid mass of interbedded ash lenses containing tremendous amounts of fire-cracked rock, bone detritus, and flakes, as well as several hundred artifacts. Curiously enough, charred bone amounted to less than 1 percent of the bone detritus which was saved, and fire-hardened bone to only 6 percent of the bone detritus.

From this central area of concentration lenses of charcoal-stained sand spread into the surrounding deposits, where fire-cracked rock was sparse and bone detritus, flakes, and artifacts far less abundant.

Artifact Assemblage. Subcomponent VIIA yielded 874 artifacts, a highly varied assemblage containing
projectile points, scrapers, core tools, fishing gear, a hopper mortar, awls, gambling bones, and a host of other forms.
The following is a complete catalogue.

Artifact Catalogue.

Chipped stone artifacts (763)

Stemmed projectile points (107)

Type 5 (16)
(2) Type Variant 5A
(3) Type Variant 5B
(5) Type Variant 5C (Fig. 38, l, n-p)
(3) Type Variant 5D (Fig. 38, k)
(3) Miscellaneous specimens (Fig. 38, t-u)

Type 6 (80)
(6) Type Variant 6A
(2) Type Variant 6B
(18) Type Variant 6C (Fig. 39, k, n)
(2) Type Variant 6D (Fig. 39, cc-dd) [69]
(14) Type Variant 6E (Fig. 39, s-v)
(5) Type Variant 6F
(1) Type Variant 6G
(28) Miscellaneous specimens (Fig. 39, ff-gg)
(4) Points in the process of being manufactured
(5) "Type" 7 (Fig. 40, ii, kk-nn)

Type 9 (3)
(3) Type Variant 9A
(2) Form 2 (Fig. 42, b-c)
(1) Form 6 (Fig. 42, h)

Leaf-shaped projectile points (2)
(2) Form 1 (Fig. 42, n)

Triangular projectile points (40)

Type 1 (37)
(7) Type Variant 1A (Fig. 44, a-c)
(30) Type Variant 1C (Fig. 44, i, k)
(1) Form 1 (Fig. 44, t)
(1) Form 2 (Fig. 44, v)
(1) Form 3 (Fig. 44, w)

Semi-triangular projectile points or knives (13)
(3) Type 1
(9) Type 2 (Fig. 45, e, g-h)
(1) Style 1

Lanceolate projectile points (1)
(1) Form 4

Pentagonal projectile points and knives (2)
(2) Style 1 (Fig. 46, j-k)

(69) Point and knife fragments

Knives (187)
(65) Type 1 (Fig. 47, a, c, e-h, k)
(9) Style 1 (Fig. 49, b, d)
(6) Style 2 (Fig. 49, e-h)
(2) Style 3
(1) Style 4 (Fig. 49, l)
(1) Style 5

53
(1) Style 6
(1) Style 8
(2) Style 10 (Fig. 51, b)
(1) Style 11 (Fig. 51, c)
(3) Form 1 (Fig. 51, f)
(3) Form 2 (Fig. 51, h)
(1) Form 3
(1) Form 4 (Fig. 51, j)
(2) Form 7
(3) Miscellaneous specimens (Figs. 51, l; 52, a, c)
(85) Fragments
Core tools (26)
(25) Type 2 (Fig. 53, g, h)
(1) Form (Fig. 53, i) [70]
Scrapers (148)
(36) Type 1 (Fig. 54, l)
Type 2 (40)
(2) Type Variant 2A (Fig. 55, a)
(8) Type Variant 2C (Fig. 55, g, j, m)
(30) Type Variant 2D (Fig. 56, b-d)
Type 3 (1)
(23) Style 1 (Fig. 58, b)
(2) Style 2 (Fig. 58, g)
(10) Style 3 (Fig. 56, h)
(1) Style 4
(18) Fragments of end and side scrapers
(17) Fragments of other scrapers
Gravers (7)
(5) Type 1 (Fig. 59, a-b)
(2) Style 1
(5) Drills and awls (Fig. 59, l-m, o, q)
(4) Possible blades
(153) Utilized flakes (Fig. 63, g, k)
(2) Basalt spall scrapers
(1) Edge-worn fragment of basalt
(4) Miscellaneous flaked cobble tools (Fig. 66, d)
Stone tools of percussion (9)
Hammerstones (6)
(4) Style 1 (Fig. 67, d, f)
(2) Style 3 (Fig. 68, c)
Crushing implements (3)
(3) Style 1
(1) Hopper mortar
Beads and pendants of stone (2)
(1) Style 1 (Fig. 74, f)
(1) Form 2 (Fig. 74, t)
(1) Ground basalt tablet
(1) Ocher pallet
(4) Red ocher
Bone and antler artifacts (67)
Awls (13)
(8) Type 1 (Fig. 76, a-c)
(1) Type 2 (Fig. 78, g)
(2) Type 3 (Fig. 79, c)
(1) Form 2 (Fig. 81, c)
(1) Awl fragment
Composite harpoon valves (1)
(1) Form II
Composite harpoon tips or barbs (1)
(1) Form 1 (Fig. 85, i)
(2) Lateral barb guards for three-pronged salmon spears (Fig. 86, d-e)
Projectile points (2)
(2) Style 1
Hafts (1) [71]
(1) Form 1 (Fig. 86, c)
(1) Spatulate scraper (Fig. 88, d)
(1) Fleshing implement (Fig. 88, e)
(2) Splinter scrapers or fleshers
Pressure-flaking implements (7)
(6) Type 1 (Fig. 89, i)
(1) Style 1
Antler splitting wedges (1)
(1) Type 1 (1)
Beaver tooth engraver
Gambling bones (2)
(2) Form 1 (Fig. 93, a)
(4) Fragments of points, awls, or other pointed objects
(8) Fragmentary antler objects
(5) Fragmentary bone objects
(7) Cut bone detritus (Fig. 96, a-c)
(1) Cut antler detritus
(5) Adzed antler beams (Fig. 96, e-f)

Total number of artifacts (847)

Associated Materials. The following catalogue of associated materials recovered from Subcomponent VIIA represents a comparatively small sample of the tremendous quantities of detritus encountered. Only the figure for the salmon vertebrae represents all or nearly all of any of the categories encountered. Cryptocrystalline silica flakes and mammal bone detritus occurred in proportionately much larger quantities than the following figures actually indicate.

Mammal bone detritus (at least 90% deer) ....................... 3,763
Bird bone detritus .......................................................... 12
Rodent bone detritus ......................................................... 2
Salmon vertebrae .................................................................. 317
Freshwater mussel shells .................................................... 66
Cryptocrystalline silica flakes .............................................. 6,148

SUBCOMPONENT VIIB

Stratigraphy and House Design. Subcomponent VIIB is a circular pit house which was excavated into Subcomponent VIIA and subsequently intruded by another pit house, Subcomponent VIIF (Figs. 5, 6, 18, 19, 20). The plan view of the house is presented in Figure 19, while Figures 5 and 20 provide cross-sections on the north-south and east-west axes of symmetry. The house was seventeen feet in diameter and excavated at least to a depth of 3.5 feet below the surface of the ground. The outer wall was vertical and terminated at a flat bench or shelf which encircled the entire interior of the dwelling. On the west and north sides of the house this bench averaged between six and seven feet in width, but on the south and east sides narrowed to scarcely over two feet. Near the edge of the bench on the
west side of the house a post mold was encountered extending into the sterile sands of Stratum 4. It was two inches in
diameter and extended eight inches below the surface of the bench (see Fig. 19, Subcomponent VIIIB, Feature 1). It
could not have been a post large enough to be a structural member, that is, a supporting column.

On the south side of the bench, where it became narrow, two pits, evidently used for storage, were excavated
into the edge of the bench and the edge of the floor at the bottom of the [72] bench. They were approximately 2.5
feet in diameter, three feet deep, and extended into the bench wall at an angle of 45 degrees (see Fig. 19,
Subcomponent VIIIB, Features 2 and 3). In one, Feature 2, some fire-cracked rock and a chopper-like crushing
implement were found (see stone tools of percussion, crushing implements). The other, designated Feature 3,
contained nothing.

Artifact Assemblage. Subcomponent VIIIB not only designates the house feature and directly associated
artifacts, but also all of the artifacts recovered in the house fill, a deposit that extends about three feet above the floor
before being truncated by Subcomponent VIIIF. Few artifacts were actually found on or near the floor, diagnostic
specimens being limited to a digging stick handle (Fig. 87) and a projectile point of Type Variant 6C. The vast
majority of the artifacts were scattered throughout the fill and do not date from the period of actual house occupation.
Because the fill is truncated by the floor of a pit house which was excavated to a depth of at least three feet during the
Cayuse II period, it is reasonable to assume that the assemblage from the fill is representative of the Cayuse I
Subphase.

Artifact Catalogue. A total of 285 artifacts were recovered from the subcomponent. Though a less varied
assemblage than that of Subcomponent VIIA, the relative distribution of major artifact types is essentially the same.

Chipped stone artifacts (233)

- Stemmed projectile points (13)
  - Type 5 (3)
    - (1) Type Variant 5A
    - (2) Type Variant 5B (Fig. 38, f)
  - Type 6 (9)
    - (1) Type Variant 6A (Fig. 39, d)
    - (2) Type Variant 6C
    - (1) Type Variant 6D (Fig. 39, ee)
    - (1) Type Variant 6E
    - (1) Type Variant 6F
    - (2) Miscellaneous specimens
      - (1) "Type" 7 (Fig. 40, hh)

- Triangular projectile points (6)
  - Type 1 (6)
    - (6) Type Variant 1C (Fig. 44, n)

- Pentagonal projectile points or knives (1)
  - (1) Type 1 (Fig. 46, f)
  - (12) Point and knife fragments

Knives (32)

- (4) Type 1
  - (1) Style 3 (Fig. 49, j)
  - (1) Style 4 (Fig. 49, k)
  - (1) Style 5
  - (1) Style 6 (Fig. 50, c)
  - (1) Style 8 (Fig. 50, g)
  - (1) Style 10 (Fig. 51, a)
  - (1) Form 7
  - (21) Fragments

- Core tools (2)
  - (2) Type 2 [73]

- Scrapers (42)
  - (7) Type 1
  - (3) Type Variant 2C (Fig. 55, i, n-o)
Type Variant 2D
(2) Type 3 (Fig. 57, a)
(7) Style 1 (Fig. 58, c)
(2) Style 3
(7) Fragments of end and side scrapers
(10) Fragments of other scrapers
Gravers (4)
(1) Type 1
(3) Style 1 (Fig. 59, g)
(5) Drills and awls
(1) Possible blade
(115) Utilized flakes
(3) Miscellaneous flaked cobble tools
Stone tools of percussion
(4) Hammerstones (1)
(1) Style 3 (Fig. 68, d)
Crushing implements (3)
(3) Style 1
(2) Hopper mortars
(1) Abrasive
(1) Shaft straightener
(1) Yellow ocher
(2) Red ocher
Bone and Antler artifacts (36)
Awls (11)
(4) Type 1 (Figs. 76, d; 77)
(2) Type 2 (Fig. 78, e, h)
(5) Type 3 (Figs. 79, a; 80, a)
(1) pin or needle (Fig. 82, g)
Projectile points (2)
(2) Type 1 (Fig. 85, a)
(1) Digging stick handle (Fig. 87)
(1) Spatulate scraper (Fig. 88, e)
Pressure flaking tools (1)
(1) Type 1
(1) Splinter scraper or flesher
Beads and pendants (2)
(2) Style 1
(1) Fragment of awl, point, or other pointed object
(3) Fragmentary antler artifacts
(9) Fragmentary bone artifacts
(1) Cut bone detritus
(1) Cut antler detritus
(1) Adzed antler beam
Shell artifacts of trade (2)
(1) Type I [74]
(1) Form 3 (Fig. 97, g)
Total number of artifacts (285)

Associated Materials. The following is a catalogue of flaking detritus and faunal remains recovered from Cultural Component VIIIB. It is a representative sample only, the only nearly true numerical value being that for salmon vertebrae.

Mammal bone detritus (at least 90% deer) .................. 2,186
Bird bone detritus ........................................... 6
Rodent bone detritus ................................................................. 1
Salmon vertebrae ..................................................................... 93
Freshwater mussel shells ........................................................ 62
Cryptocrystalline silica flakes .................................................. 1,979

SUBCOMPONENT V11C

Stratigraphy and House Design. Subcomponent V11C, like VIIB, is a pit house which was excavated into Subcomponent VIIA and in turn intruded by a much more recent structure, Subcomponent VIIH (see Figs. 18, 19, 21, 22). It is a subrectangular or ovate structure, 33 feet long and 24 feet wide, and was excavated to a depth in excess of 4.5 feet. Like Subcomponent VIIB, it possesses an encircling interior bench elevated to a height of three feet above the level of the house floor and varying from 3.5 to 4 feet in width. The floor area is level, being 28 feet long and 19 feet wide. At the southern end of the house, a large, deep post mold penetrates the floor a few inches from the edge of the bench. This post mold evidently marks the position of one of the major structural supports for the superstructure of the house (see Fig. 19, Feature 1). Although no other structural features were noted, it is possible that a diamond-shaped arrangement of four posts might be positioned so that three of them would lie outside the excavated area.

Nonstructural Features. Two features were recovered which have no apparent connection with the house structure itself. The first of these, Feature 2, consists of either a partial burial or a burial remnant consisting of a fragmentary innominate, a few ribs, same phalanges, and a complete jaw all apparently of an adult individual. These were found in the center of the house floor, resting on the surface of a shallow depression which was approximately three inches deep. A small fire had been kindled just above the bones, and as a result some of the phalanges were partially charred. It is not known whether this represents a reburial just beneath the house floor, the intrusion of the house structure into an older burial, or possibly a combination of both. Profiles around the base of the house bench reveal that the house was cleaned of debris and reoccupied at least once, probably only a few years after it initially fell into disuse. It is therefore possible that the burial dates from the first occupation and its disturbance from the second occupation. A similar burial was reported from 45GR27, a site located near Moses Lake (Daugherty 1952: House Pit 1).

The other nonstructural feature is a small earth oven which was encountered in the house fill eight inches above the floor (Fig. 22, Feature 3). As no charred bone was found in association with it, this oven was probably used to cook vegetable food. It is probably not connected with the occupation of the house.

Artifact Assemblage. Subcomponent V11C has been applied to all of the cultural materials on the house floor and in the first 1.5 feet of fill above the house floor. Most of the 112 artifacts encompassed in this assemblage were recovered on or within six inches of the floor itself. It is axiomatic that all of the artifacts in the assemblage do not date from the actual occupation of the house [75] and highly probable that all represent the Cayuse I period in as much as the house fill has been truncated by a more recent house floor.

Artifact Catalogue. It may be of interest to note that the ten incised pins or needles and three of the four Dentalia beads were among those artifacts actually found on the floor of the house.

Chipped stone artifacts (79)

Stemmed projectile points (9)
  Type 5 (2)
    (1) Type Variant 5A
    (1) Type Variant 5C
  Type 6 (7)
    (1) Type Variant 6C
    (1) Type Variant 6F
    (5) Miscellaneous specimens
Triangular projectile points (4)
  Type 1 (4)
    (4) Type Variant 1C
Semi-triangular points or knives (1)
  (1) Type 2
  (11) Point or knife fragments
Knives (12)
(5) Type 1
(1) Style 1
(6) Fragments
Core Tools (2)
(2) Type 2
Scrapers (21)
(6) Type 1 (Fig. 54, n)
Type 2 (6)
(1) Type Variant 2C
(5) Type Variant 2D
(4) Style 1
(2) Fragments of end and side scrapers
(3) Fragments of other scrapers
Gravers(1)
(1) Type 1
(2) Drills and awls
(16) Utilized flakes
(2) Basalt spall scrapers (Fig. 64, a)
(1) Miscellaneous flaked cobble tool (Fig. 66, b)
Stone tools of percussion (3)
Hammerstones (2)
(1) Style 1 (Fig. 67, e)
(1) Style 3 (Fig. 68, a)
Crushing implements (1)
(1) Style 1
(3) Red ocher
Bone and antler artifacts (20)
Awls (1) [76]
(1) Fragment
(10) Pins or needles (Figs. 82, e-f; 83)
Splitting wedges (1)
(1) Type 1
(1) Small bone hammer (Fig. 92, a)
Beads and pendants (2)
(1) Type 1
(1) Form 1
(1) Fragment of projectile point, composite harpoon tip, or barb
(1) Fragment of point, awl, or other pointed object
(1) Fragmentary bone object
(1) Cut bone detritus
(1) Cut antler detritus
Shell artifacts of trade (4)
Ornaments (4)
(4) Type 1 (Fig. 97, h)

Total number of artifacts (112)

Associated Materials. The following is a catalogue of flaking detritus and faunal remains recovered from Subcomponent VII C. It represents but a sample of the total amount of such materials encountered during the subcomponent's excavation.

Mammal bone detritus (at least 90% deer). ............................................................ 528
Rodent bone detritus ................................................................................................ 1
Salmon vertebra. ........................................................................................................ 39
Freshwater mussel shells. ........................................................................................ 47
Cryptocrystalline silica flakes ........................................................................... 759

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SUBCOMPONENT VIID

**Stratigraphy and House design.** Subcomponent VIID was located in the test excavation at House Pit 7, a small depression approximately 200 feet north of the main excavations at House Pit 15 (Fig. 4). Here a rather elaborate, apparently rectangular pit house had been excavated into Strata 3 and 4 from the lower portion of Stratum 5 (Figs. 23, 24). If the reconstruction presented in Figure 24 has been correctly inferred from the test area, the house was small and rectangular, being 19 feet long and 16 feet wide. It was excavated to a depth of not less than five feet and possessed an encircling interior bench 1.75 feet wide at a height of two feet above the floor level. At the south end of the floor there is a flat-bottomed, rectangular, sunken area approximately six inches deep. It is 7.5 feet long and 6.5 feet wide, and may have been designed as a cold trap or hearth area. It contained a single feature, a small pile of rocks some of which were fire cracked. However, no charcoal was found in association, and it is thus doubtful that the rocks are the remains of a hearth.

**Artifact Assemblage.** The 164 artifacts grouped under the Subcomponent VIID designation were recovered on or within a few inches of the house floor. The seven basalt spall scrapers were found in a cache located in the fill six inches above the bottom of the sunken hearth area or cold trap. [77]

Artifact Catalogue.

**Chipped stone artifacts (127)**
- Stemmed projectile points (24)
  - Type 5 (2)
    - (1) Type Variant 5A (Fig. 38, b)
    - (1) Type Variant 5B
  - Type 6 (21)
    - (6) Type Variant 6C (Fig. 39, m)
    - (7) Type Variant 6E (Fig. 39, t)
    - (1) Type Variant 6F
    - (1) Type Variant 6G
    - (6) Miscellaneous specimens (Fig. 39, kk)
  - (1) "Type" ? (Fig. 40, jj)
- Leaf-shaped projectile points (1)
  - (1) Form 1 (Fig. 42, m)
- Triangular projectile points (4)
  - Type 1 (4)
    - (4) Type Variant 1C (Fig. 44, g)
- Semi-triangular points and knives (2)
  - (2) Type 2
  - (12) Point or knife fragments
- Knives (31)
  - (9) Type 1 (Fig. 47, 1)
  - (3) Style 1
    - (1) Style 4
    - (1) Style 7 (Fig. 50, e)
    - (1) Style 9 (Fig. 50, i)
    - (1) Miscellaneous specimens (Fig. 52, g)
  - (15) Fragments
- Core tools (1)
  - (1) Type 2
- Scrapers (30)
  - (13) Type 1 (Fig. 54, e, g, m)
    - Type 2 (7)
      - (2) Type Variant 2C (Fig. 55, l)
      - (5) Type Variant 2D
    - Type 3 (2)
      - (2) Type Variant 3A (Fig. 56, f)
  - (3) Style 1 (Fig. 58, a, d)
  - (2) Style 3 (Fig. 56, j)
  - (1) Fragments of end and side scrapers
(2) Fragments of other scrapers
Gravers (4)
   (2) Type 1
      (1) Style 1 (Fig. 59, f)
      (1) Form 1 (Fig. 59, j)
   (3) Drills and awls (Fig. 59, n)
   (15) Utilized flakes
   (7) Basalt spall scrapers (Fig. 64, f)
(1) Miscellaneous flaked cobbles (Fig. 66, g)
Stone tools of percussion (1)
   Hammerstones (1)
      (1) Style 1
(8) Red ocher
Bone and antler artifacts (19)
   Awls (2)
      (1) Type II
      (1) Type 3 (Fig. 79, g)
   Composite harpoon valves (1)
      (1) Form 1 (Fig. 84, a)
   Splinter scraper or flesher
Pressure-flaking implements (8)
      (4) Type 1
      (3) Style 1 (Fig. 89, e)
      (1) Form 1 (Fig. 89, a)
   Antler splitting wedges (1)
      (1) Type 1
      (1) Fragment of point, harpoon tip, barb, etc.
      (1) Fragment of pointed object
      (2) Bone artifact fragments
      (2) Cut bone detritus
Shell artifacts of aboriginal trade (1)
   Shell ornaments (1)
      (1) Type 1
Total number of artifacts (164)

SUBCOMPONENT VIIIE

Stratigraphy. Subcomponent VIIIE is located in the House Pit 7 excavation (Fig. 4) and designates a saucer-shaped paraconformity which occupies the depression created by Subcomponent VIID. The subcomponent designation is also applied to the artifacts resting on this surface and in the fill immediately above it.

There are two ways in which this saucer-shaped paraconformity may be interpreted. It might represent a natural fill line in the house depression left by Subcomponent VIID, or it could be the remains of a small saucer-shaped pithouse excavated into the depression marking Subcomponent VIID. Such structures occur at 45KT28 during the last part of the Cayuse III Subphase. If Subcomponent VIIIE represents such a pit house, the three feet of fill which have accumulated over the house floor roust be interpreted as being largely dump from the construction of another structure, House Pit 5, a Cayuse III saucer-shaped house only a few feet to the north. In this event the fill above the supposed floor of VIIIE and most of the artifacts which it contained would represent the Cayuse II and III Subphases.

Unfortunately, the test of House Pit 7 was not extensive enough to resolve these interpretations. As a result, Subcomponent VIIIE cannot be assigned to any of the Cayuse subphases. It is dealt with as a definite subcomponent because it can be stratigraphically delimited, and because of its stratigraphic proximity to Subcomponent VIID. [79]

Artifact Catalogue.
Chipped stone artifacts (32)
   Stemmed projectile points (5)
Type 5 (2)
   (1) Type Variant 5B
   (1) Type Variant 5C (Fig. 38, m)
Type 6 (3)
   (1) Type Variant 6C
   (1) Type Variant 6E
   (1) Type Variant 6F
Triangular projectile points (1)
   (1) Form 2 (Fig. 44, u)
(1) Point or knife fragment
Knives (10)
   (3) Type 1
   (3) Style 1
   (4) Fragments
Scrapers (3)
   (2) Type 1
   (1) Fragment
Gravers (1)
   (1) Type 1
   (1) Drill or awl
   (10) Utilized flakes
(3) Basalt spall scrapers
Bone and antler artifacts (2)
   Bone awls (1)
   (1) Type 3
   (1) Drill or awl
   (1) Form 3
Flaking implements (1)
   (1) Form 3

Total number of artifacts (37)

IDENTIFYING THE CAYUSE I SUBPHASE

The Cayuse I Subphase is defined most positively by the use or occurrence of pit houses which possess
level floor areas encircled by vertical walls into which step-like benches have been carved. Other criteria must be
chosen with caution because artifact types in general and projectile points types in particular apparently remain
more or less stable throughout the Cayuse I and Cayuse II subphases.

The data from 45KT28 indicate that the relative frequencies of a few artifact types may have changed
slightly at the end of the Cayuse I Subphase. These observations, summarized in the following statements, may be
used as a starting point for defining other differences between the Cayuse I and Cayuse II subphases. (1) Between 15
and 20 percent of all projectile points are of the Quilomene Bar Base-Notched type during the Cayuse I Subphase.
These figures are deflated to between 5 and 12 percent during the Cayuse II Subphase. (2) Between 70 and 80 percent
of all stemmed projectile points are certain varieties of the Columbia Plateau Comer-Notched type (Type Variants 6C
through 6G in addition to miscellaneous specimens). During the Cayuse II Subphase these figures are depressed by
approximately 5 percent. (3) Type Variants 6A and 6B (Columbia [80] Plateau Corner-Notched points) account for
less than 4 percent of the stemmed projectile points during the Cayuse I Subphase, but for between 7 and 12 percent of
this category during the Cayuse II Subphase. (4) Biconical antler projectile points appear to be predominant during the
Cayuse I Subphase. (5) Incised geometric designs on antler artifacts may be more common during the Cayuse I
Subphase than in any other of the Cayuse subphases.

These statements, it must be emphasized, embody a low order of statistical probability and have to be
checked against data from other sites in the Vantage locale before they can be accepted as truly definitive.

AGE AND DURATION OF THE CAYUSE I SUBPHASE

The beginning of the Cayuse I Subphase is coeval with the beginning of the Cayuse Phase itself. A C\textsuperscript{14} date
of 1715 B.P. from the Vantage locale indicates that the Cayuse I Subphase was underway prior to 250 A.D., probably
The duration and termination of the Cayuse I Subphase cannot be established with any precision without the aid of C\textsuperscript{14} dating. The deposits at 45KT28 give the impression that the Cayuse I period is of longer duration than any other of the Cayuse subphases. However, many extraneous factors such as differential rates of midden accumulation and shifting settlement patterns may be at work prejudicing this impression. In the absence of C\textsuperscript{14} dates extreme caution must be exercised in assigning chronological limits to the termination of the Cayuse I Subphase and the beginning of the Cayuse II Subphase. On the basis of our present knowledge of the area, I would place this break between 600 and 1300 A.D.

The Cayuse II Subphase

The Cayuse II Subphase is characterized by pit houses with vertical side walls and level floor areas when these are in association with projectile point assemblages overwhelmingly predominated by Columbia Plateau Corner-Notched and Quilomene Bar Base-Notched points. The subphase began between 600 and 1300 A.D. and terminated between 1600 and 1700 A.D. At 45KT28 it is represented by two subcomponents which yielded 210 artifacts in addition to quantities of chipping detritus and faunal remains.

SUBCOMPONENT VIIF

**Stratigraphy and House Design.** Subcomponent VIIF is a pit house which was excavated into the depression left by an earlier structure, Subcomponent VIIIB (Figs. 5, 6, 18, 19, 20). It is roughly circular in outline, about 20 feet in diameter, and possesses a level floor area. The side walls, which have almost completely collapsed, were evidently vertical and probably reached a height of no more than three feet. The only structural feature encountered was a storage pit which was excavated next to and connected with the house structure. It was located on the west side of the house (Figs. 19, 20, 22) and was excavated to a depth equal to that of the house floor. It contained several artifacts, including four projectile points, two knife fragments, and a number of nondescript scrapers.

**Artifact Assemblage.** The subcomponent designation is applied to artifacts lying on the house floor and in the first twelve inches of fill above the floor. Fill lines above the floor indicate that much of the higher fill is dump, probably from the excavation of Subcomponent VIIH, an adjacent structure dating from a more recent period. [81]

Only 75 artifacts were recovered from Subcomponent VIIF. Fortunately, these include 18 identifiable projectile points. Among the stemmed points, all diagnostic specimens are of Types 5 and 6, much the same as those contained in the Cayuse I assemblages.

**Artifact Catalogue.**

Chipped stone artifacts (63)

Stemmed projectile points (16)

Type 5 (1)

(1) Type Variant 5C

Type 6 (12)

(2) Type Variant 6A

(3) Type Variant 6C

(1) Type Variant 6E (Fig. 39, u)

(1) Type Variant 6F (Fig. 39, x)

(5) Type 6, miscellaneous specimens

(1) "Type" 7

(1) Form 4 (Fig. 42, f)

(1) Form 8 (Fig. 42, j)

Triangular projectile points (2)

Type 1 (2)

(2) Type Variant 1C

(7) Point or knife fragments

Knives (9)

(4) Type 1

(1) Style 1

(1) Form 3 (Fig. 51, i)

(3) Fragments

Scrapers (11)

(2) Type 1

Type 2 (2)
(2) Type Variant 2D  
(1) Style 1  
(2) Style 2  
(1) Style 3  
(2) Fragments of end or side scrapers  
(1) Fragments of other scrapers

Gravers (1)  
(1) Type 1  
(1) Drill or awl  
(1) Possible blade  
(15) Utilized flakes (Fig. 63, m)

(1) Edge-worn fragments of basalt  
(1) Yellow ocher

Bone and antler artifacts (10)  
Awls (2)  
(1) Type 1  
(1) Fragments

(1) Spatulate scraper (Fig. 88, a)  
Antler splitting wedges (1)  
(1) Type 1 [82]  
(1) Fragments of points, awls etc.  
(3) Fragmentary antler artifacts  
(2) Fragmentary bone artifacts

Total number of artifacts (75)

Associated Materials. The following is a catalogue of flaking detritus and faunal remains recovered from Subcomponent VII F. It represents but a sample of the total amount of such materials encountered during the subcomponent's excavation.

Mammal bone detritus (at least 90% deer) .................................................. 670
Bird bone detritus ................................................................. 2
Rodent bone detritus ................................................................. 2
Salmon vertebrae ................................................................. 33
Freshwater mussel shells ................................................................. 24
Cryptocrystalline silica flakes ................................................................. 484

Subcomponent VII G

Stratigraphy and House Design. Subcomponent VII G was located in the excavations at House Pit I (Fig. 4). It is a rectangular structure the eastern edge of which has been washed away by the Columbia River (Fig. 26). The north-south dimension is 37 feet, and it is likely that the east-west dimension was in the same order of magnitude, though only 25 feet of the deposits in that direction remained intact at the time of excavation. The floor of the house is quite level, and the side walls rise vertically to a height slightly over three feet above the floor (Fig. 27).

An unusual feature complex was encountered along the northern edge of the house structure (Fig. 28). Here a slight recess had been cut into the house wall. At its bottom, excavated into the house floor, a large hearth was encountered which contained fire-cracked rock and charcoal-stained soil (Fig. 28, Feature 1). Above and to the west of the hearth, a large rectangular notch had been cut into the lip of the house wall. At the back of this recess a small storage pit had been gouged (Fig. 28, Feature 2). A similar, but smaller pit had been dug in the lip of the house wall above the western end of the fire pit (Fig. 28, Feature 3).

Another feature, not associated with either house structure or the fill in the house depression, was located just to the south of the southern house wall. It was a cache pit, excavated from the bottom of Stratum 5 into the uppermost portion of Stratum 4. It contained the only Type 1 core tool associated with Cultural Component VII, an end scraper, some round core tools (Type 2), and a number of large flake scrapers. Although it antedates Subcomponent VII G, it is impossible to assign it to a specific subphase because our overall knowledge of the area's stratigraphy is not sufficiently detailed.

Artifact Assemblage. The subcomponent designation VII G is applied to all those artifacts associated with the
house floor and the first 12 inches of fill above the floor. A total of 135 artifacts were recovered, including 31 chipped stone projectile points.

Artifact Catalogue.

Chipped stone artifacts (117)
- Stemmed projectile points (20)
  - Type 5 (2) [83]
    - (1) Type Variant 5C
    - (1) Type Variant 5D
  - Type 6 (18)
    - (4) Type Variant 6A
    - (1) Type Variant 6B
    - (2) Type Variant 6C
    - (1) Type Variant 6D (Fig. 39, bb)
    - (1) Type Variant 6F
    - (8) Miscellaneous specimens
      - (1) Point in the process of manufacture
- Triangular points (10)
  - Type 1 (10)
    - (10) Type Variant 1C
- Semi-triangular points (1)
  - (1) Type 2
- Point or knife fragments

Knives (17)
- Type 1
  - (3) Type 1
  - (1) Style 1
  - (1) Style 2
  - (1) Style 4
  - (11) Fragmentary knives
- Core tools (2)
  - (2) Type 2

Scrapers (19)
- Type 1
  - (3) Type 1
  - (2) Type Variant 2C (Fig. 55, h)
  - (3) Type Variant 2D
- Type 3 (2)
  - (1) Type Variant 3A
  - (1) Type Variant 3B (Fig. 57, b)
  - (2) Style 1
  - (1) Style 2
  - (1) Style 3
  - (2) Fragments of end or side scrapers
  - (3) Fragments of other scrapers

Gravers (1)
- (1) Style 1 (Fig. 59, h)
- (1) Possible blade (Fig. 61, i)
- (39) Utilized flakes (Fig. 63, a)
- (1) Basalt spall scraper

Stone tools of percussion (1)
- (1) Pestle (Fig. 67, a)

Bone and antler artifacts (33)
- Projectile points (1)
  - (1) Type 1 (Fig. 85, f)
- Hafts (1)
  - (1) Type 1 [84]
(1) Spatulate scraper (Fig. 88. b)
Splitting wedges (4)
   (4) Type 1 (Fig. 90, e)
Beads and pendants (1)
   (1) Type 1 (Fig. 93 j)
(1) Fragment of point, awl, etc.
(3) Cut bone detritus
(1) Adzed antler beam

Shell artifacts of aboriginal trade
(2) Shell ornaments (1)
   (1) Type 1
Shell artifacts of utility (1)
   (1) Type 1 (Fig. 97, e)

Total number of artifacts (135)

Associated Materials. The following is a catalogue of flaking detritus and faunal remains from Subcomponent VIIG. It represents but a sample of the total amount of such materials encountered during the subcomponent's excavation.

Mammal bone detritus (at least 90% deer) ................................................................. 730
Bird bone detritus .................................................................................. 3
Rodent bone detritus .......................................................................................... 1
Salmon vertebrae ........................................................................................... 95
Freshwater mussel shells .............................................................................. 210
Cryptocrystalline silica flakes ........................................................................ 1,265

IDENTIFYING THE CAYUSE II SUBPHASE

The Cayuse II Subphase is defined through the use of two criteria. The first of these is a stemmed projectile point assemblage overwhelmingly dominated by Quilomene Bar Base-Notched and Columbia Plateau Corner-Notched points. The second is the occurrence of pit houses with level floor areas and vertical, unbenched walls. Taken separately, each of these characteristics persists over a greater period of time than the Cayuse II Subphase. The specified artifact assemblage also characterizes the Cayuse I Subphase where it is, however, associated with pit houses having interior benches. Similarly, flat-floored, vertical-walled pit houses persist throughout most or all of the Cayuse III Subphase, where they are associated with a quite different projectile point assemblage. It is the period of overlap, during which each of these characteristic features occur together, that marks the Cayuse II Subphase.

Due to a clear change in artifact types, the Cayuse II Subphase is readily distinguishable from the Cayuse III Subphase wherever there are clearly stratified projectile point assemblages for each. Unfortunately, this is not true of the Cayuse I Subphase. In deposits where house features are lacking, it may prove difficult or even impossible to distinguish the Cayuse I and Cayuse II subphases. Data from 45KT28 suggest that differences in the artifact assemblages characteristic of these subphases will be limited to (1) slight changes in the relative frequencies of some common artifact types, and (2) the possible addition or deletion of rarely occurring artifact forms. The following, inferred from the assemblages recovered at 45KT28, are suggested frequency changes which may be useful in distinguishing between Cayuse I and II subphase assemblages in the absence of structural remains. (1) Type Variants 6A and 6B (Columbia Plateau corner-Notched points) account for between 7 and 12 percent of all stemmed projectile points during the Cayuse II Subphase, but during the Cayuse I Subphase they accounted for less than 4 percent of this category. (2) All other Columbia Plateau Corner-Notched points comprise between 65 and 75 percent of the stemmed points during the Cayuse II Subphase, but between 70 and 80 percent of such points during the Cayuse I Subphase. (3) It is also suggested that 5 to 12 percent of all stemmed projectile points manufactured during the Cayuse II Subphase were Quilomene Bar Base-Notched points, while during the Cayuse I Subphase such points accounted for between 15 and 20 percent of this assemblage. In addition to evidence such as this, the technical aspects of stone flaking should be studied as a part of the search for nonstructural criteria by which the Cayuse I and II subphases might be defined in mutually exclusive terms.

AGE AND DURATION OF THE CAYUSE II SUBPHASE
Adequate information regarding the beginning of the Cayuse II Subphase is not yet available. Crude estimates place the date between 600 and 1300 A.D.; more exact dating must await \(^{14}C\) age determination. The upper limits of the Cayuse II Subphase are more closely defined, as ethnographic information places the beginning of the Cayuse III Subphase between 1600 and 1700 A.D. Thus the duration of the Cayuse II Subphase may have been as little as 300 years or as much as 1,100.

Stratigraphic relationships in the House Pit 15 area at 45KT28 give one the impression that the period was relatively short-lived. However, factors such as differential rates of midden accumulation may have biased the data on which this observation is based.

The Cayuse III Subphase

The Cayuse III Subphase, beginning between 1600 and 1700 A.D. and terminating in the early historic period, appears to represent a cultural response within the Plateau to the expanding American frontier. It is characterized by a host of distinctive features, including the mass diffusion of artifact types from one part of the Plateau to another and the extensive influence of Plains culture which has so preoccupied the ethnographers of Plateau culture.

This subphase is represented by five subcomponents at 45KT28. Of these only three yielded diagnostic assemblages containing 1,320 artifacts as well as large amounts of faunal remains and chipping detritus.

SUBCOMPONENT VIIH

Stratigraphy and House Design. Subcomponent VIIH, the most recent pit house encountered in the House Pit 15 excavation, was dug into the depression left by another, much older structure, Subcomponent VIIC. In the process an adjacent depression marking Subcomponent VIIF was evidently used as a dump area for much of the earth from the house excavation. As a result all surface indications of the existence of Subcomponent VIIF were obliterated.

Because the floor and walls of Subcomponent VIIH are poorly defined in the Stratigraphic record, our knowledge of the house design is dependent in large part upon the distribution of certain traits peculiar to the house floor and fill immediately above the floor. These include large quantities of salmon vertebrae, beads and pendants of stone, adzes, pipes, and certain varieties of stemmed projectile points (Type Variants 6A and 6B, Types 8, 9, 10, 11). From the distribution of these items, the extent of the house depression, and Stratigraphic sections on the east, south, and west edges of the structure, it may be said that Subcomponent VIIH was an oval-shaped house approximately 40 feet long, 35 feet wide, and three feet deep. The floor was level and the walls nearly vertical. No structural features were encountered.

Artifact Assemblage. The fill within the house structure averaged about three feet in thickness and was highly productive throughout. In addition to 427 artifacts, large amounts of detritus were recovered.

Artifact Catalogue.

Chipped stone artifacts (253)

Stemmed projectile points (91)

Type 5 (2)

(2) Type Variant 5A

Type 6 (54)

(25) Type Variant 6A (Fig. 39, a-c, f)

(3) Type Variant 6B

(5) Type Variant 6C (Fig. 39, i-j)

(2) Type Variant 6E

(1) Type Variant 6G (Fig. 39, z)

(17) Miscellaneous specimens (Fig. 39, hh)

(1) Points in the process of manufacture

Type 8 (14)

(1) Type Variant 8A

(2) Type Variant 8D (Fig. 41, l)

(5) Type Variant 8E (Fig. 41, i-k)

(4) Type Variant 8F (Fig. 41, o)

(3) Type Variant 8G (Fig. 41, q)

(1) Miscellaneous specimens (Fig. 41, y)

Type 9 (13)
(11) Type Variant 9A (Fig. 40, b, fj, p-q)
(2) Type Variant 9D (Fig. 40, z)
Type 10 (4)
(3) Type Variant 10A (Fig. 41, ii-kk)
(1) Type Variant 10B (Fig. 41, mm)
Type 11 (2)
(2) Type Variant 11A (Fig. 41, oo)
(1) Form 1 (Fig. 42, a)
(1) Form 9
Triangular points (10)
Type 1 (10)
(1) Type Variant 1B
(9) Type Variant 1C (Fig. 44, h, q)
Semi-triangular points (4)
(3) Type 1 (Fig. 45, c-d)
(1) Type 2 (Fig. 45, f)
Lanceolate points (1)
(1) Form 3 (Fig. 45, l)
(36) Point or knife fragments
Knives (44)
(7) Type 1 (Fig. 47, b)
(1) Style 1
(3) Style 2 [87]
(1) Style 3
(1) Style 10
(1) Style 11 (Fig. 51, d)
(1) Miscellaneous specimen (Fig. 52, d)
(28) Fragments
Core tools (4)
(4) Type 2
Scrapers (32)
(8) Type 1 (Fig. 54, h-i)
Type 2 (11)
(2) Type Variant 2C (Fig. 55, k)
(9) Type Variant 2D
Type 3 (2)
(1) Type Variant 3A
(1) Type Variant 3B
(3) Style 1
(1) Style 3
(5) Fragments of end and side scrapers
(2) Fragments of other scrapers
Gravers (3)
(3) Type 1
(2) Possible blades (Fig. 61, g)
(26) Utilized flakes (Fig. 63, c, i-j)
(24) Basalt spall scrapers (Fig. 64, c, e, g, i)
(2) Miscellaneous flaked cobble tools (Fig. 66, c)
Stone tools of percussion (10)
(3) Pestles (Fig. 67, c)
Crushing implements (7)
(7) Style 1 (Fig. 70, f)
(2) hopper mortars
(5) Ground adzes (Fig. 71, a-c)
(3) Pipes (Fig. 72, a-c)
(1) Shaft smoother (Fig. 73, b)
Stone beads and pendants (39)
(22) Style 1 (Fig. 74, a-e, g-i)
(5) Style 2 (Fig. 74, k-m)
(2) Style 3 (Fig. 74, n)
(2) Form 1 (Fig. 74, o)
(7) Form 2 (Fig. 74, q-s, u-w)
(1) Form 3 (Fig. 74, p)
(5) Round sandstone balls (Fig. 74, x-y)
(4) Yellow ocher
(2) Red ocher
Bone and antler artifacts (62)
Awls (21)
(4) Type 1
(3) Type 2 (Fig. 78, d, i)
(10) Type 3 (Figs. 79. h-i; 80. b-d)
(4) Fragments
(1) Pin or needle (Fig. 82, a) [88]
Composite harpoon valves (1)
(1) Type 1
Composite harpoon tips (2)
(2) Style 1 (Fig. 85, m-n)
Composite harpoon tips or salmon spear barbs (1)
(1) Type 1
Projectile points (2)
(1) Type 1
(1) Style 2 (Fig. 85, h)
Pressure flaking implements (16)
(13) Type 1 (Fig. 89. g)
(2) Style 1
(1) Form 3 (Fig. 89, d)
Antler splitting wedges (1)
(1) Type 1
(1) Beaver tooth engraver (Fig. 91, b)
Gambling bones (5)
(5) Style 1 (Fig. 93, d)
Beads and pendants (2)
(1) Style 1
(1) Form 5
(3) Fragments of points, awls, etc.
(4) Fragmentary bone artifacts
(1) Cut bone detritus
(1) Adzed antler beam
Shell artifacts of trade (9)
Ornaments (9)
(6) Type 1 (Fig. 97, h)
(1) Form 1
(2) Form 2 (Fig. 97, d)
Shell artifacts of local manufacture (3)
(3) Type 1 (Fig. 97. c)
Total number of artifacts 427

Associated Materials. The following is a catalogue of flaking detritus and faunal remains recovered from Subcomponent VIIH. It represents but a sample of the total amount of such materials encountered during the subcomponent's excavation.

Mammal bone detritus (at least 90% deer) .............................................................. 2,571
Bird bone detritus .................................................................................................... 6
SUBCOMPONENT VII-I

**Stratigraphy and House Design.** Subcomponent VII-I is located at the House Pit 12 depression (Fig. 4) and was largely excavated by Mr. Ted Weld of Seattle, Washington, a number of years before the Washington Archaeological Society worked at the site. Unfortunately, Mr. Weld did not keep profile records of the stratigraphy, and it remained for society excavations around the lip of the house pit to demonstrate the nature of the house structure and house fill. These excavations confirmed the recollections of Mr. Weld regarding the shape and type of house structure, and allow the following reconstruction to be made.

Subcomponent VII-I was a circular or nearly circular pit house between 35 and 40 feet in diameter. It was excavated to a depth of approximately five feet and possessed a level floor and vertical side walls (Figs. 4 and 29).

The only peculiar structural feature noted was a small pit adjacent to the main house structure (Fig. 4, House Pit 29). Very similar to Feature 1 at Subcomponent VIIIF (Figs. 20, 22), this pit had vertical walls and was excavated to approximately the same depth as the main house structure. Its function is not known; suggested possibilities include a storage pit or menstrual hut.

**Artifact Assemblage.** Although Mr. Weld kept the artifacts from this subcomponent intact, no more specific data are available regarding their relative stratigraphic positions within the house fill. Fortunately, however, this presents no serious problem either in using the assemblage for comparative purposes or in placing it in the continuum of subcomponents representing the Cayuse Phase. Controlled excavations along the lip of the house pit disclosed that the house fill was homogeneous and everywhere highly productive of artifacts. Over 20 percent of all the artifacts recovered could have been derived only from a Cayuse III subcomponent, but there is no artifact which was recovered which could not be so ascribed. The relative frequencies of stemmed projectile point types, when compared with comparable figures for Subcomponent VIIH, suggest that we are not dealing with a watered-down Cayuse III assemblage but one which is even more representative of the subphase. This view is supported by a more detailed look at the assemblages from the two subcomponents in question. In addition to all of the artifact types contained in the assemblage from Subcomponent VIIH, Subcomponent VII-I contains many Plateau Pentagonal and Columbia River Mule-Eared knives as well as projectile points representative of a fully developed tradition of Columbia Plateau Side-Notched Points (Type 10), a more rudimentary form of which is found in Subcomponent VIIH.

The assemblage from Subcomponent VII-I contains 772 artifacts, 376 of which are identifiable projectile points. Associated flaking detritus and faunal remains were not saved.

**Artifact Catalogue.**

Chipped stone artifacts (644)

<table>
<thead>
<tr>
<th>Stemmed projectile points (320)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 5 (8)</td>
</tr>
<tr>
<td>2) Type Variant 5A (Fig. 38, c-d)</td>
</tr>
<tr>
<td>2) Type Variant 5B (Fig. 38, h)</td>
</tr>
<tr>
<td>4) Miscellaneous specimens (Fig. 38, q, v)</td>
</tr>
<tr>
<td>Type 6 (198)</td>
</tr>
<tr>
<td>103) Type Variant 6A (Fig. 39, e, g-h)</td>
</tr>
<tr>
<td>10) Type Variant 6B</td>
</tr>
<tr>
<td>25) Type Variant 6C</td>
</tr>
<tr>
<td>11) Type Variant 6E (Fig. 39, w)</td>
</tr>
<tr>
<td>3) Type Variant 6F (Fig. 39, y)</td>
</tr>
<tr>
<td>2) Type Variant 6G</td>
</tr>
<tr>
<td>42) Miscellaneous specimens (Fig. 39, ii, ll)</td>
</tr>
<tr>
<td>2) Specimens in the process of manufacture [90]</td>
</tr>
<tr>
<td>Type 8 (39)</td>
</tr>
<tr>
<td>1) Type Variant 8A (Fig. 41, a)</td>
</tr>
<tr>
<td>4) Type Variant 8B (Fig. 41, b-d)</td>
</tr>
</tbody>
</table>
(2) Type Variant 8C (Fig. 41, e)
(3) Type Variant 8D (Fig. 41, g)
(7) Type Variant 8E (Fig. 41, l-m)
(4) Type Variant 8F (Fig. 41, n-p)
(1) Type Variant 8G (Fig. 41, r)
(13) Miscellaneous specimens (Fig. 41, s-x, z)

Type 9 (39)
(25) Type Variant 9A (Fig. 40, a, o-d, g-i, k, m-o, r-t)
(5) Type Variant 9B (Fig. 40, u-w)
(1) Type Variant 9C
(3) Type Variant 9D (Fig. 40, bb)
(3) Type Variant 9E (Fig. 40, cc, ee)
(2) Type Variant 9F (Fig. 40, ff-gg)

Type 10 (27)
(1) Type Variant 10A
(24) Type Variant 10B (Fig. 41, aa-ff, hh-ii)
(2) Type Variant 10C (Fig. 41, nn)

Type 11 (9)
(7) Type Variant 11A (Fig. 41, pp)
(2) Type Variant 11B (Fig. 41, qq-rr)

Leaf-shaped projectile points (3)
(3) Form 1 (Fig. 42, 1, o-p)

Triangular projectile points (31)
Type 1 (31)
(1) Type Variant 1A
(4) Type Variant 1B (Fig. 44, d-e)
(26) Type Variant 1C (Fig. 44, j, r-s)

Semi-triangular projectile points (20)
(13) Type 1 (Fig. 45, a-b)
(2) Type 2
(1) Style 1 (Fig. 45, m)
(2) Form 1 (Fig. 45, i)
(2) Form 2 (Fig. 45, j-k)

Lanceolate projectile points (20)
(1) Form 2 (Fig. 45, o)
(1) Form 4

Pentagonal points and knives (24)
(6) Type 1 (Fig. 46, e, g-i)
(13) Type 2 (Fig. 46, a-d)
(2) Style 1 (Fig. 46, i)
(2) Form 1 (Fig. 46, n)
(1) Form 2 (Fig. 46, m)

(93) Point or knife fragments [91]

Knives (44)
(16) Type 1 (Fig. 47, m)
(1) Style 1 (Fig. 49, c)
(1) Style 2
(2) Style 5 (Fig. 50, b)
(1) Style 6 (Fig. 50, d)
(1) Style 8 (Fig. 50, h)
(1) Style 11
(2) Form 5 (Fig. 51, k)
(2) Form 6 (Fig. 52, j)
(1) Miscellaneous specimen (Fig. 51, m)
(16) Fragments
Core tools (3)
   (3) Type 2
Scrapers (56)
   (36) Type 1 (Fig. 54, f, j-k)
     Type 2 (9)
       (1) Type Variant 2A (Fig. 55, b)
       (2) Type Variant 2B (Fig. 55, c-d)
       (4) Type Variant 2C (Fig. 55, e-f)
       (2) Type Variant 2D
     Type 3 (1)
       (1) Type Variant 3A (3)
Style 3
   (3) Fragments of end and side scrapers
   (4) Fragments of other scrapers
Gravers (5)
   (2) Type 1
   (2) Style 1
     (1) Form 1 (Fig. 59, i)
(10) Drills and awls (Fig. 59, k, r)
(33) Utilized flakes (Fig. 63, h)
(8) Basalt spall scrapers
Stone tools of percussion (4)
   (2) Pestles (Fig. 67, b)
   Hammerstones (1)
     (1) Form 1 (Fig. 69)
Crushing implements (1)
   (1) Style 1 (1)
Ground adze (Fig. 71, d)
   (1) Shaft smoother (Fig. 73, a)
   (1) Red ocher
Bone and antler artifacts (102)
Awls (27)
   (4) Type 1 (Fig. 76, e-f)
   (3) Type 2 (Fig. 78, b, f)
   (8) Type 3 (Fig. 79, d-f)
   (1) Style 1 (Fig. 81, b)
   (11) Fragments [92]
   (4) Pins and needles (Fig. 82, b-c)
Composite harpoon valves (2)
   (1) Type 1 (Figs. 84, b; 85, q)
   (1) Form 1
Composite harpoon tips (1)
   (1) Style 1
Composite harpoon tips or salmon spear barbs (5)
   (4) Type 1 (Fig. 85, j-l)
   (1) Form 1 (Fig. 85, p)
Projectile points (8)
   (5) Type 1 (Fig. 85, b-e)
   (2) Style 3 (Fig. 85, t-u)
   (1) Form 1 (Fig. 85, g)
Hafts (1)
   (1) Type 1 (Fig. 86, b)
Pressure flaking implements (13)
   (13) Type 1 (Fig. 89, h, j)
Antler splitting wedges (5)
   (5) Type 1 (Fig. 90, b, d)
Gambling bones (8)
Subcomponents VIIJ and VIIK are large saucer-shaped pit houses probably representative of the last aboriginal occupation of 45KT28. The smaller, Subcomponent VIIJ, was slightly oval in outline, between 30 and 35 feet long, 25 and 30 feet wide, and four to six feet deep (Figs. 4, House Pit 5; 31). Subcomponent VIIK was of the same shape, but somewhat larger, being between 45 and 50 feet long, 40 and 45 feet wide, and five to seven feet deep (Figs. 4, House Pit 10; 30).

The fill in each of the house structures is about one foot deep, of intensely black sandy earth, and characteristically has a greasy feel to it. The configuration of each saucer-shaped depression essentially duplicates that of the house structures themselves; the mounded lip was even still intact around much of Subcomponent VIIK.

The only structural feature encountered in the small test excavations at these house pits was a circular, stone-lined hearth which had been excavated in the exact center of Subcomponent VIIK (Fig. 30).

**Artifact and Faunal Assemblages.** Only two artifacts, both basalt spall scrapers, were recovered, one deriving from each of the subcomponents. Faunal remains were much more extensive, however, and consisted entirely of tremendous quantities of deer bone, a fact which suggests that firearms may have been used by the builders of these houses.

**Subcomponent VIII**

**Stratigraphy.** Subcomponent VIII is stratigraphically defined as the uppermost six inches of midden encountered in all the excavations in Cultural Component VII. Artifacts recovered from this surface blanket of midden suggest that it is consistently representative of the Cayuse III Subphase.

**Artifact Assemblage.** Subcomponent VIII yielded 122 artifacts as well as a large number of cryptocrystalline flakes and faunal remains. Of the 21 stemmed projectile points recovered, over half are characteristic only of the Cayuse III Subphase.
Type 6 (13)
(5) Type Variant 6A
(1) Type Variant 6B (Fig. 39, q)
(2) Type Variant 6E
(4) Miscellaneous specimens
(1) Points in the process of manufacture
Type 8 (2)
(1) Type Variant 8E
(1) Miscellaneous specimens
Type 9 (2)
(1) Type Variant 9C (Fig. 40, y)
(1) Type Variant 9E (Fig. 40, dd)
Type 10 (2)
(2) Type Variant 10C
Type 11 (1)
(1) Type Variant 11A
Triangular projectile points (2) [94]
Type 1 (2)
(2) Type Variant 1C
Semi-triangular projectile points (1)
(1) Form 2
Pentagonal projectile points (1)
(1) Type 1
(12) Point or knife fragments
Knives (19)
(3) Type 1
(1) Style 3
(1) Style 11 (Fig. 51, e)
(14) Fragments
Core tools (3)
(3) Type 2
Scrapers (15)
(1) Type 1
Type 2 (5)
(3) Type Variant 2C
(2) Type Variant 2D
Type 3 (1)
(1) Type Variant 3A
(2) Style 2 (Fig. 58, f)
(2) Fragments of end and side scrapers
(4) Fragments of other scrapers
Gravers (1)
(1) Type 1
(1) Drill or awl
(1) Possible blade (Fig. 61, c)
(34) Utilized flakes
(3) Basalt spall scrapers (Fig. 64, d)
(1) Steatite pipe (Fig. 72, a)
Bone and antler artifacts (5)
Beaver tooth engravers (1)
(1) Type 1
Gambling bones (1)
(1) Style 2
Beads and pendants (1)
(1) Form 2 (Fig. 93, n)
(1) Fragmentary bone artifacts
(1) Cut bone detritus
Metal artifacts (1)
(1) Phoenix button (Fig. 99, b)
Total number of artifacts (122)

Associated Materials. The following is a catalogue of flaking detritus and faunal remains recovered from Subcomponent VII L. It represents but a sample of the total amount of such materials encountered during the subcomponent's excavation. [95]

Mammal bone detritus (at least 90% deer) ............................................................. 676
Bird bone detritus .................................................................................................... 1
Rodent bone detritus ................................................................................................ 4
Salmon vertebrae .................................................................................................... 22
Freshwater mussel shells ..................................................................................... 112
Cryptocrystalline silica flakes .............................................................................. 871

IDENTIFYING THE CAYUSE III SUBPHASE

A representative sample from a typical Cayuse III Subphase assemblage is depicted in Figures 32 and 33. In the Vantage locale, such assemblages may be formally defined by a variety of reliable criteria, some of which may also be used to distinguish early and late subphase components. The most reliable of these are listed below.

1. Stemmed projectile points of the Upper Columbia Stemmed Complex (Type 8) were in use throughout the Cayuse III Subphase. As its title might indicate, this type contains many diverse forms of stemmed and shouldered points. Such diversity suggests that ideas about projectile point forms and processes of manufacture were in a state of flux, an observation borne out by the same tendency to heterogeneity in every other point type during the Cayuse III Subphase. Points of this type are most similar to a large group of stemmed forms common in The Dalles area over the last thousand years of prehistory. They evidently diffused northward from this area at the beginning of the Cayuse III Subphase.

2. Stemmed projectile points with open corner notches are common throughout the Cayuse III Subphase, but rare in earlier subphases. The most numerous and characteristic of these is the Wallula Rectangular-Stemmed Point (Type Variant 9A), a form of some standing in The Dalles area from whence it is thought to have diffused at the beginning of the Cayuse III Subphase.

3. Columbia Plateau Corner-Notched points are dominated by Type Variants 6A and 6B. It is estimated that points of these variants account for 50 to 60 percent of all Columbia Plateau Corner-Notched points and 30 to 35 percent of all stemmed projectile points. The origin of these points appears to date back to the Cayuse II Subphase where they are first introduced as a really tangible tradition. It is not known why they become common at the beginning of the Cayuse III Subphase. However, a general tendency toward the reduction of point size may in some way be an associated phenomenon.

4. Following upon the third point, a concomitant reduction occurs in all other varieties of the Columbia Plateau Corner-Notched point so that such specimens account for only 25 to 30 percent of all stemmed projectile points being manufactured.

5. The introduction of Plateau Pentagonal and Columbia Mule Ear knives occur in the latter portion of the Cayuse III Subphase. Both of these types are thought to have diffused northward from the area of The Dalles or the Middle Columbia where they are common prior to the beginning of the Cayuse III Subphase. That they did not diffuse northward as early as stemmed and shouldered or Wallula Rectangular-Stemmed points may be partially a function of the division of labor, provided such knives were predominately the property of women rather than men.

6. The introduction of the Columbia Plateau Side-Notched Point (Type 10) occurred some time shortly after the beginning of the subphase. The first of this type to be introduced at 45KT28 are rather crude and proportioned differently from later specimens, a fact which implies a short period of development during the early portion of the subphase. The Columbia Plateau [96] Side-Notched Point is believed to have diffused from the northern Plains. Evidence supporting this conclusion is presented in the comments on Type 10 stemmed projectile points.

7. The occurrence of stemmed projectile points of Type 11 also marks the Cayuse III Subphase. This criterion, though apparently valid, is not often applicable because Type 11 points are not common.

8. The manufacture of projectile points directly from flakes rather than triangular preforms is a technique diffused from The Dalles during the Cayuse III Subphase. It is used primarily in conjunction with the manufacture of
points which belong to the Upper Columbia Stemmed Complex (Type 8), also believed to have diffused from the area of The Dalles at the beginning of the Cayuse III Subphase.

9. Greatly expanded Trade, reflected in the increased abundance of formerly common trade goods and the introduction of new commodities, is one of the most fundamental characteristics of the Cayuse III Subphase. Items like abalone, catlinite, and even such exotics as turquoise were making their way into the Plateau probably for the first time. At the same time other trade commodities were entering the Plateau in quantities much larger than ever before. These included obsidian, *Olivella* beads, *Dentalia*, pecten shells, and ground nephrite adzes.

10. The saucer-shaped pit house was introduced, probably quite late in the subphase. As more information accumulates about such structures, it may be possible to use them in defining a fourth Cayuse subphase. This would depend on what overlap existed in the use of saucer-shaped and flat-floored, vertical-walled pit houses as well as upon the analyst's preference for choosing subphase criteria. Presently, I regard saucer-shaped structures as another in a long list of items diffused into the Vantage locale during the Cayuse III Subphase.

11. Trade items of European origin and other evidences of early historic contacts are characteristic of the terminal portion of the Cayuse III Subphase.

Apart from major criteria such as these, there are a number of other traits that may be tentatively proposed as characteristic of all or part of the Cayuse III Subphase. These include: (1) the occurrence of cist cremations; (2) the introduction of Type 1 gambling bones, bilaterally barbed antler projectile points, and art motifs from the area of The Dalles; (3) the increased use of stone beads and pendants; (4) the use of small quantities of basalt in the manufacture of projectile points; and (5) the incision of geometric designs on *Dentalia* beads.

It must be emphasized that all of these criteria are applicable to the Vantage locale in specific and to the Upper Columbia-Sun Lakes area in general. Although equivalents of the Cayuse III Subphase occur throughout the Plateau, many of the specific criteria by which they may be defined are different from those applied in the Vantage locale.

**PLATEAU WIDE EQUIVALENTS OF THE CAYUSE III SUBPHASE**

Four general observations may be made about the formal characteristics of the Cayuse III Subphase in the Vantage locale. (1) There was a great deal of diffusion northward along the Columbia River from the area of The Dalles and the Middle Columbia into the Vantage locale and the Upper Columbia-Sun Lakes area. (2) Diffusion was also occurring in an east-west direction between the Plains and the Plateau. (3) Trade throughout the Vantage locale and, inferentially, the Plateau was greatly increased. (4) This occurred in the very late prehistoric and early historic periods. [97]

Comparable events appear to have been occurring all over the Plateau during this late prehistoric-early historic period. Cayuse III components, used in the strict sense of that terminology, occur throughout the Upper Columbia and Sun Lakes areas. Representative sites include 45KT6 (Massey and Nelson 1958), Bed B of Cedar Cave (Swanson 1962b), House Pits 12 and 14 at Schaake Village (Swanson 1958), upper remains at Duck Cave (Swanson 1962b), House Pits 6 and 7 at 45KT13 (Osborne 1956-67), 45CH57 (Gunkel 1961), 45CH62 (Gunkel 1961), 45DO51 (Gunkel 1961), 45GR2 (Mills and Osborne 1952), 45OK5 (Osborne, Crabtree, and Bryan 1952), 45OK7 (Osborne, Crabtree, and Bryan 1952), 45OK2 (Osborne, Crabtree, and Bryan 1952), the bulk of the sites reported by Collier, et al, (1942), 45GR78 (Osborne 1959) 45GR80 (Osborne 1959), the house pit at 45GR88 (Osborne 1959), 45GR74 (Osborne 1959), 45GR91 (Osborne 1959), 45GR94 (Osborne 1959), 45GR27 and 45GR30 (Daugherty 1952).

It is obvious that parallel events have occurred elsewhere in the Plateau. Highly specific data for the Canadian Plateau are not yet available, but the spread of small side-notched projectile points through the East Kootenay region (Borden 1956) and the Fraser River canyon is apparent.

Moving southward along the eastern foothills of the Cascade Mountains, our only comparative data come from the Yakima Valley (Smith 1910; Warren 1959). Warren's (1959) work at the Wenon Creek Site is particularly revealing. In a series of stratified deposits, only the most recent contained an assemblage which closely matched anything from the arid interior of the Plateau. This component (XA and XB) is definitely an equivalent to the Cayuse III Subphase, a fact which suggests that much of the Yakima Valley may have been archaeologically very distinct from adjacent sections of the Plateau prior to the Cayuse III period.

Throughout the Middle Columbia and along the lower Snake River, Cayuse III equivalents are abundant. Representative components may be found at Fish Hook Island (Lelander 1958; Daugherty and Combes 1963: personal communication), 45BN3 (Osborne 1957), 45BN53 (Osborne 1957). Rabbit Island II (Crabtree 1957), 35UM17 (Shiner
This brief overview of the Plateau has been presented in order to demonstrate that the Cayuse III Subphase is not an isolated phenomenon, but finds equivalents throughout the Washington and British Columbia plateaus.

**THE FRONTIER EXPANSION HYPOTHESIS**

It is the contention of this argument that the Cayuse III Subphase and its Plateau-wide equivalents represent an archaeological record of the direct and indirect effects which the expanding American frontier had on Plateau culture between 1600 and 1810 A.D.

Ethnographic data indicate that Plateau culture was undergoing many important changes during the late prehistoric period. Most frequently emphasized is the effect that Plains culture, itself a product of westward expansion, had on the peoples of the Plateau (e.g., see Teit 1930; Ray 1939). However, it is also evident that the Plateau was exerting an influence of its own at this time. For example, the practice of sweating evidently diffused to the coast of Washington, and the prophet dance may have been exported to Nevada and California (Aberle 1959).

Large-scale Plains-Plateau contacts were probably unfeasible or unthought of prior to the advent of the horse. This mode of transportation must have greatly increased the mobility of both groups and individuals throughout the Plateau, not only resulting in a tremendously increased rate of contact between the Plateau, the Plains, and the Great Basin, but also increased interchange within the Plateau itself, and between the Plateau and the coast. With more varied and intensive cultural contacts, trading patterns must have been profoundly affected. Vast new markets were opened up and old ones geographically extended. The Plateau became a kind of exchange point along a number of lengthened trade routes.

These ethnographically deduced relationships seem to be clearly reflected by the Cayuse III Subphase and its equivalents throughout the Plateau. Abalone, catlinite, turquoise, and *Olivella* shells had to be traded over great distances, while adzes, *Dentalia*. and other common goods flood the Plateau in large quantities. Plains-Plateau relationships are further testified to by the introduction of small side-notched points, probably from the northern Plains.

At the same time, mass diffusion within the Plateau produces a thought-provoking phenomenon. The Cayuse I and Cayuse II periods apparently saw a series of regional developments within the Plateau insofar as the specifics of material culture were concerned. With the coming of the Cayuse III period these regional assemblages were diffused, coalescing to form what might be described as something approaching a pan-Plateau material culture extending from the Okanagon Highlands on the north to The Dalles on the south, and from the Cascade Mountains on the west to the foothills of the Rocky Mountains on the east. The significance of this apparent convergence is potentially great because it may provide data by which we may explore some of the continuities and discontinuities between the archaeological and ethnological measurement of culture change.

**The Succession of Pit Houses during the Cayuse Phase**

Based on data from 45KT28 and on unpublished research in the Vantage locale, it is apparent that there was an orderly succession of three house types during the Cayuse Phase. The earliest of these types, a deep pit house with interior benches, is by no means a simple structure and thus poses some real problems in dealing with the introduction and age of pit houses throughout the Plateau.

There are at present two basic ways of dealing with this problem. The first postulates that pit houses have been in use in the Plateau for a considerable period of time, perhaps for as much as 4,000 or 6,000 years. Three lines of evidence may be interpreted so as to support this view. (1). Two pit houses in the Vantage locale (Swanson 1962b: Schalkop Site) may derive from the Frenchman Springs Phase and would thus date roughly between 800 and 1700 B.C. (2) A possible pit house was encountered in association with the original Cold Springs Phase assemblage (Shiner 1961). If the association and identification are correct, the use of pit houses would be pushed back to between 2000 and 4000 B.C. (3) The common occurrence of structurally complicated pit houses in the beginning of the Cayuse period suggested a long period of development not yet represented in our data because of the lopsided emphasis upon riverine archaeology.

The alternative position holds that pit houses were introduced into the Plateau at the beginning of the Cayuse Phase. Advocates of this position regard possible earlier occurrences as in need of more documentation and considerable substantiation. Complicated benched houses common in the early Cayuse period are thought to be either the products of diffusion or a trait carried into the Plateau by an invading culture. However, it is stressed, although the emphasis on riverine archaeology may indeed have biased our view of Plateau prehistory, we can base realistic
hypotheses only upon the data which we actually control.

No matter what view one takes, it must be admitted that the origin of pit houses in the Plateau is very imperfectly understood. The distribution of house types and settlement patterns in relationship to the economic round has yet to be thoroughly studied for any period in the prehistoric record of the Plateau.

The three house types characteristic of the Cayuse Phase in the Vantage locale are present throughout the Plateau, but occur in greatly varying abundance from one area to another.

Type 1. The earliest house type is a deeply excavated structure possessing an interior bench which traverses the entire house wall. There is considerable variation in house size and outline. The bench may also vary considerably in width and in its height above the house floor. However, both the bench and the floor are level. Other structural details such as storage pits and fire hearths occur erratically.

This house type is evidently abundant along the Upper Columbia and present along the lower Snake River, but it is as yet not formally reported from the Middle Columbia. In the Vantage locale it constitutes the major defining criterion of the Cayuse I Subphase.

Type 2. This type possesses vertical walls and a level floor. No bench is present, and the house excavation does not commonly attain a depth greater than five feet. Outline, size, and structural details are quite variable.

Along the Upper Columbia this house type is abundant during the Cayuse II and III subphases. It also occurs in reduced number in many other areas of the Plateau, particularly along the Middle Columbia.

Type 3. Type 3 pit houses are simple, saucer-shaped structures with sloping walls and more or less level floors depending on the house size. The outline is nearly always round or slightly oval. Size, however, varies considerably, and house diameters in excess of 50 feet are not uncommon. Little is presently known of other structural details.

Type 3 structures are characteristic of the late Cayuse III Subphase and its equivalents throughout the Plateau.

The succession of these three house types, from walled houses with benches to walled houses without benches, to nonwalled houses, suggests a tendency toward structural simplification throughout the Cayuse Phase. It should be mentioned, however, that a simplification in pit form may not entail a simplification in the house superstructure. In fact, the exceedingly large structures sometimes encountered in the Cayuse III period may have required a superstructure more complicated than any of their predecessors.

Winter Village Patterns

A map of the house depressions along with their dimensions, depths, and outlines is presented in Figure 4. Unfortunately, it is of little use in studying specific village patterns because the depressions mapped represent nearly 1,800 years of sporadic house building. However, from the information acquired at 45KT28 and many other sites in the Vantage locale, a few general points may be made concerning village patterns in the area. (1) Winter villages were nearly always situated on the floodplain of the Columbia River or on high river terraces adjacent to it. (2) There was a tendency to reuse old house depressions, a pattern which may have contributed to the stability of many village sites. (3) During any particular winter the average village was probably relatively small, most likely on the order of from 5 to 15 houses.

Early villages of contemporaneously occupied houses are not easily identified in the archaeological record due to erosion, deposition, house pit re-utilization, and the limited nature of archaeological sampling at any particular archaeological site. On the other hand, villages of Type 3 structures are easily identifiable on the basis of simple examinations of house depressions. Such villages may follow at least two plans. (1) Houses may be tightly bunched together in a roughly circular or rectangular pattern. Houses 3, 5, 9, 10, and 11 represent such a village at 45KT28. (2) The houses may be strung out in a long line parallel to the river bank. An excellent example of this arrangement occurs at 45KT27, a site in the middle of Quilomene Bar.

Correlations with Swanson's Cayuse Sequence

The Cayuse Phase was originally defined by Earl Swanson (Swanson 1956; 1958; 1962b). Because this original definition is at odds in many of its particulars with the view of the Cayuse Phase presented in this report, I feel obligated to correlate our respective data. Hopefully this will reduce to a minimum the confusion which might otherwise be generated by the apparent discontinuities between our published views.

At the outset we must give Swanson considerable credit for his accomplishments in the Vantage area.
Working with small samples which posed many problems both in correlation and interpretation, Swanson proposed the first series of formally defined phases for any area in the Plateau. Although Swanson's absolute chronology and his breakdown of subphases may be vigorously contested, his identification of major phases and their significance in Plateau prehistory stands out as a major achievement.

Primary among his contributions was the identification of the Cayuse Phase with the origin of ethnographic Plateau culture. By properly defining this phase and linking it to the emergence of winter villages, Swanson called attention to the most important single shift in cultural patterns evident in Plateau prehistory. Swanson estimated that this dramatic change, which marked the beginning of the Cayuse Phase, had taken place at approximately 1200 A.D. This date, based on uncertain geological estimates, has since proved in error if we are to believe a series of C14 dates and more recent geological estimates for sites both on the Snake and Columbia rivers. These dates suggest that the Cayuse Phase began in the Vantage locale sometime near the beginning of the Christian era, most probably between 50 B.C. and 250 A.D.

On the basis of geological estimates of age and pitifully small samples of material culture, Swanson proposed a breakdown of the Cayuse Phase into three subphases. These subphases do not correspond in any simple relationship with the three subphases proposed in this report, and the fact that both Swanson and I have recognized three subphases is coincidental.

Swanson has identified seven Cayuse components, each from a different site. (1) The houses at Schaeke Village he assigns to the Cayuse III and historic periods; applying the criteria in this report, they may be assigned to the Cayuse III Subphase. (2) He assigns Bed B of Cedar Cave to the Cayuse II Subphase; according to the criteria proposed in this report, it is definitely a Cayuse III component. (3) Swanson suggests that the upper remains at Shelter 8B are Cayuse I or II in age; a pentagonal point or knife suggests that they probably represent the Cayuse III Subphase of this report. (4) He suggests that the house pits at the Lee Site document a Cayuse III occupation; by the definitions offered in this report, they are probably Cayuse III in age, (5) Finally, he suggests that Shelter 8C and Crabtree Cave contain Cayuse III components and that Hole-in-the-Wall Cave contains a Cayuse I component; here the samples are insufficient to stipulate any subphase designation in accordance with the criteria set forth in this report. [101]

SUMMATION

THE SITE AND ITS ASSEMBLAGES

In evaluating this report and the site with which it deals, the reader should remember the following facts, for they underlie many of the conclusions and speculations the author has attempted to develop in coping with the cultural record at 45KT28.

1. 45KT28 is located on the western edge of the semiarid heartland of the Columbia Plateau. To the east of the site this semiarid heartland contains few permanent streams or lakes, and economic resources are limited primarily to edible roots, rodents, and small deer. To the west the foothills of the Cascade Mountains provide wooded watersheds and larger numbers of streams. Thus the economic resources are more variable and include not only edible roots, rodents, and deer, but also salmon, a variety of birds, elk, bear, and wild berries. The area to the west was therefore probably more heavily utilized throughout the prehistoric record.

2. The site is situated along the Columbia River and will, therefore, reflect slightly different adaptations than sites located on tributary streams to the west or in the more arid country to the east. Cultural Components I through VI represent the seasonal camps of whole or fragmentary bands which were always small in size. Deer hunting was evidently the major economic activity in the area. Cultural Component VII, on the other hand, represents the winter village pattern which Ray (1932) has described for the Sanpoil and Nespelem.

3. The data from 45KT28, which are substantiated by other sequences throughout the Plateau, suggest that the only marked change in social and economic structure occurred at the beginning of the Cayuse Phase. At this time band societies were replaced by simple tribal forms of social structure as these types of organization are defined by Service (1962).

Since broad conclusions and specific comparisons are alike dependent upon the field data, it is not proper to close this section of the report without some reference to assemblage reliability. Basically two kinds of assemblages are represented in the sequence at 45KT28; the first characteristic of Cultural Components I through VI, the second characteristic of Cultural Component VII.

As noted above, Cultural Components I through VI represent seasonal encampments of relatively small size. The assemblages in this portion of the sequence also tend to be small, averaging 110 artifacts per component. In a few
instances small assemblages are due to the restricted nature of the components themselves, but in most cases are a
function of sampling. This problem is represented in the extreme by Cultural Component III, tests of which yielded
199 artifacts. Estimates of relative productivity and probable component size indicate that total excavation would have
produced between 25,000 and 50,000 artifacts. Thus it may be argued that our sample is statistically insignificant.
This is certainly true with regard to many kinds of statements which we might ideally want to make about the
assemblage in question. Most significant will be errors of omission, wherein certain types of artifacts actually present
may not appear in the sample, and errors in relative percentage wherein certain types or classes of artifacts will be
overly or insufficiently represented. Thus the assemblages from Cultural Components I through VI have not been
dealt with as closed and complete systems, and the relative percentages of their constituents only slightly relied upon
in making comparisons or evaluations, or in the generation of hypotheses.

The assemblages from the early components of the site have, however, another kind of reliability. Although
each sample is small, it occurs in a sequence of similar samples. Therefore each assemblage may be thought of as a
critical commentary on its neighbors in the established temporal [102] continuum. This acts as a check against major
omissions which, when they occur, will produce anomalies within the sequence. The comparison of the sequence with
similar classes of data extends our information laterally in space and so, too, operates to increase the confidence level
of our various assemblages. Since the sequence from 45KT28 does not contain anomalies and agrees with our
knowledge of the Upper Columbia and the Plateau at large, it may be regarded as a reliable tool for assessing local
developmental trends and generating hypotheses.

Because nearly 3,950 artifacts were recovered from Cultural Component VII, over-all assemblage reliability
is probably quite good. As a result the Cayuse Phase has been dealt with in greater detail.

THE PROJECTILE POINT SEQUENCE

Because the early phase distinctions of Vantage, Cold Springs, Rabbit Island, and Quilomene Bar are largely
based upon changes in projectile point types, let us conclude with a brief presentation of the projectile point sequence
at the site. The succession of projectile point types is schematically presented in Figure 34, in which stippled
specimens represent types which were rapidly diffused into the Upper Columbia, and diagonally lined specimens
represent types which were probably diffused into the area. Specimens neither lined nor stippled represent types the
origin of which is presently impossible to trace; whether they are products of diffusion or internal development is not
known.

Other general properties of the sequence may be summed up in the following statements.

1. During the Vantage Phase projectile points were very large and based on a leaf-shaped outline, which was
sometimes modified by shouldering. During the Cold Springs and Frenchman Springs phases leaf-shaped points
decreased in importance. During this period there was a great reduction in size, flaking became finer, and a greater
number of body outlines are in use. Throughout the Quilomene Bar and Cayuse phases leaf-shaped points are rare,
representing items of trade or aberrant forms.

2. Both notched and unnotched triangular projectile points were first introduced during the Cold Springs
Phase at which time a dramatic shift occurs from leaf-shaped to triangular point forms. This shift is completed by the
beginning of the Quilomene Bar Phase. Thereafter, virtually all projectile points are based on a triangular outline,
notched points being manufactured from triangular blanks.

3. The relative abundance of particular projectile point types is shown in Figure 35. Although based primarily
upon the data from 45KT28, information from other sites in the Vantage locale was taken into account in the preparation
of this figure.

4. A more detailed presentation of the stemmed projectile point types is presented in Figure 36. The relative
percentages suggested in this figure are based entirely on the data from 45KT28.

More specific data regarding the frequency of projectile point types may be found by consulting the specific
types and type variants in Appendix A. Tables 1 and 2 summarize the data numerically and will be of help in
evaluating Figures 34, 35, and 36. [103]

V. MODELS FOR PLATEAU PREHISTORY

The following essay is designed to acquaint the reader with some of the author’s general thoughts about
Plateau prehistory. It is hoped that it will thus provide a meaningful context for the more specific interpretations of
Plateau sequences presented in Part IV of this report.
As our knowledge of Northwest prehistory grows, an ever-increasing number of models will be offered to explain the historic and cultural significance of Plateau sequences. They will vary according to the specific questions which their designers wish to pose and tentatively answer. Their worth will be measured partially in terms of their perceptiveness and in part by the amount of discussion and research that they stimulate.

Very few models presently exist which attempt to systematize the whole of Plateau prehistory. Of those that do exist, most tend to see the Plateau as something to which the model is secondarily applied. The evolutionary schemes of Willey and Phillips (1958), Beardsley (Beardsley et al. 1955), and Service (1962) are examples of such general models.

Plateau-centered models do exist, however. Perhaps the most important of these is the Intermontane Western tradition (Daugherty 1962). With this model, Daugherty proposes a series of general developmental ties between the Southwest, the Great Basin and the Plateau, and specifies a sequence of periods perceptible in the archaeology of each. Because the model presented in this essay proposes an alternative series of periods based on inferred historic relationships between the Plateau and surrounding geographic areas, it also constitutes a partial analysis of the Intermontane Western tradition. Let us begin, therefore, with a review of Daugherty's five proposed periods, the Early, Transitional, Developmental, Late, and Historic.

THE INTERMONTANE WESTERN TRADITION

The Early period, lasting from about 9000 to 6000 B.C. and roughly equivalent to the Anathermal, is said to have been characterized by diverse hunting and gathering economies with the intense utilization of locally available resources such as bison and salmon. Due to sparse archaeological data little more may be said about similarities and differences within the Intermontane West during this period although it is thought that strong regional traditions had not yet developed.

The Transitional period, lasting from about 6000 to 2500 B.C., is roughly coeval with the Altithermal. In the Southwest and Great Basin gradual dessication caused a reduction in population and shift in emphasis away from hunting and toward food gathering. In the Plateau the population was concentrated along the existent waterways where riverine resources such as freshwater mussels and salmon became increasingly important at the expense of food gathering and hunting. Regional economic specialization appears to date from the Transitional period and serves to distinguish the Great Basin, Plateau, and Southwest.

During the Developmental period, lasting from about 2500 B.C. to 0 A.D., further regional specialization took place which was eventually to culminate in the late prehistoric patterns which have been ethnographically recorded. In the Southwest agricultural practices were developing, while in the Northwest better fishing techniques, coupled with a less rigorous climate, allowed the expansion of riverine populations and at the same time increasing use of food gathering and hunting. Regional elaboration continued with Transitional period elements surviving as an underlying matrix of traits. [104]

The Late period, lasting from about A.D. 0 to the Historic period, saw the emergence of fully developed area traditions in the Intermontane West. Within these traditions, the Southwest Agricultural Area tradition, the Desert Area tradition and the Northwest Riverine Area tradition, there was a strong tendency toward regional specialization. Toward the end of the Late period there was considerable influence exerted in the Plateau by Plains groups.

The Historic period witnessed a brief elaboration of both material and non-material culture which was followed by the disintegration of native societies.

AN HISTORICAL MODEL

It must be emphasized that the Intermontane Western Tradition embodies broad generalizations about general developmental trends within the entire Intermontane West. In contrast, the following model has been developed specifically for dealing with the Plateau and emphasizes relationships dependent upon historical processes such as diffusion, acculturation, and migration.

Period 1. Anathermal Hunting and Gathering: About 9000 to 6000 B.C. The earliest known Plateau assemblages are characterized by stemmed-lanceolate projectile points and appear to represent mixed hunting and gathering economies. Unfortunately, only four well-known sites have produced such components. They are Lind Coulee (Daugherty 1956a), 35WS4 (Cressman 1960), Windust Cave (Rice and Daugherty 1964: personal communication), and Mamies Rockshelter (Daugherty 1964: Personal communication). Little uniformity in the faunal assemblages associated with these components makes it difficult to assess reliably economic adaptations on a Plateau-
wide basis. At 35WS4 extensive use was made of the natural salmon fisheries of The Dalles, while the hunting of birds and land mammals was a secondary pattern. At Lind Coulee bison hunting was of primary importance while the hunting of smaller mammals and food gathering were secondary subsistence patterns. Limited faunal assemblages from Windust Cave and Marmes Rockshelter suggest a generalized hunting and gathering base. As yet it is impossible to determine whether these assemblages represent local or regional adaptations of similar subsistence patterns or various stages in the yearly economic round.

Comparative Anathermal assemblages within the Intermontane West are few and do not allow the construction of either clearly defined cultural areas or patterns of diffusion. Daugherty (1956a) has called attention to some general similarities which exist between the Lind Coulee assemblage and certain assemblages from the Southwest. Strong resemblances also exist between early projectile points types in the Columbia Plateau and those of eastern Wyoming (Agogino 1961). On the other hand, early assemblages from the Fraser River canyon in British Columbia do not resemble Period I assemblages from the Columbia Plateau even though the local ecological adaptation may have been similar to that at The Dalles, Oregon (Borden 1962). This suggests that Period I assemblages may not extend northward or westward out of the Columbia Plateau but are related to assemblages either to the south or east.

Period II. Early Altithermal Adaptations in the Columbia Plateau: 6000 to 4500 B.C. Gradual dessication at the onset of the Altithermal probably eliminated or greatly restricted many large game animals in the Columbia Plateau and so greatly diminished the big game component of the Lind Coulee Phase. According to Cressman (1960), fishing also diminished at The Dalles. Analternertial patterns of economic adaptations were replaced by highly generalized hunting-gathering patterns in which food gathering and hunting smaller animals was more greatly emphasized. The Indian Wells and Vantage phases represent this period; influences from areas outside the Columbia Plateau are not evident in the tool assemblages. [105]

Period III. Heavy Diffusion or Out-Migration from the Great Basin: 4500 to 2500 B.C. This period is represented by the Cold Springs Phase which saw the introduction of the food grinding complex into the Columbia Plateau, and was marked by a major shift from hunting to food gathering in the mixed economic system of the Plateau. The introduction of notched points and manos suggests that this basic adaptation may have been introduced from the Great Basin either through out-migrations into the southern Columbia Plateau or intensive diffusion. The first appearance of obsidian in large quantities further suggests a close link between the northern Great Basin and the Columbia Plateau.

Period IV. The Maintenance of Altithermal Patterns: About 2500 B.C. to 0 A.D. Period IV is characterized by three significant trends. (1) The basic economic adjustments made during the Altithermal are evidently maintained without significant change, while trade between the Great Basin and Plateau continues as before. (2) On top of this generalized base much regional variation occurs within the Plateau. This is particularly evident in assemblages of projectile points and cobbles implements from the Middle Columbia, the lower Snake River, and the Upper Columbia. (3) The first definitely identifiable connections with the coast of Washington date from this period. They consist in the duplication of projectile points types in the two areas (see Appendix A, Stemmed Projectile Points Type 3 and 5) and a few trade items from Rabbit Island I (Crabtree 1957). There is, however, no evidence suggesting strong coastal influences in the Plateau.

Period V. Coastal Ties: About 0 A.D. to 1650 A.D. Earlier in this report it was postulated that the beginning of the Cayuse Phase might mark the migration of Salishan speakers into the Plateau. Whether or not we agree with this hypothesis, we must admit that strong discernible ties with the coast of Washington date from this period. This is evidenced by trade, in the form of such items as Dentalia, shell pendants, mussel shell adzes and scrapers, and ground stone adzes, and by the probable diffusion of such things as art motifs, the hand maul, and antler beam hafts. More impressive, however, is the fact that some of the most basic tools in the fishing technology apparently first appear at the beginning of this period. Two excellent examples are the three-prong salmon spears and composite harpoon toggles, both of which were in use along the coasts of Washington and British Columbia in the first millennium B.C. The implication is that many of the strong riverine characteristics evident in the ethnographic expression of Plateau culture were developed in the riverine economics of western Washington and then introduced into the Plateau at the beginning of Period V.

It is probable that these riverine patterns were largely limited to the fishing technology and may be viewed as an overlay upon the hunting and gathering patterns first established during the Altithermal. In this connection it should be noted that trade with the Great Basin continues, although its importance in the northern portion of the Plateau wanes significantly. Marked regional variations in the specifics of artifact styles also occur during this Period.
Period VI. Protohistoric Movements of Populations and Culture: About 1650 to 1810 A.D. Much of the evidence for this period is presented in the comments on the Cayuse III Subphase. It is argued that Period VI represents indirect effects of the expanding American frontier. This is indicated by much diffusion and trade within the Plateau and between the Plateau and the Northwest Coast, the Great Basin, and the Plains. Ethnographic data suggest that contacts with the Plains were of particular importance during this period.

Period VI is marked by an efflorescence in material culture and a tendency away from regional variation toward greater homogeneity in artifact assemblages. [106]

Period VII. The Historic. Little need be said about this period except that it saw direct contact between Plateau peoples and the expanding American frontier. It is characterized by a brief continuation of cultural efflorescence in Period VI followed by the rapid disintegration of traditional Plateau culture.

COMPARING THE MODELS

In comparing this model with that proposed by Daugherty for the entire Intermontane West, we must keep in mind that the reference points and defining criteria for each system are different. The periods that Daugherty has proposed are designed to be meaningful within the entire Intermontane West; the periods which I have presented here are designed specifically to deal with Plateau prehistory. The reader will notice, however, that there is general time agreement between the models, a fact which at first glance would seem to support the Intermontane Western Tradition. However, we should ask ourselves if the two sets of proposed periods need be interpreted in the same way.

In discussing the Plateau both from the standpoint of the Intermontane Western Tradition and the Northwest Riverine Area tradition, Daugherty emphasizes gradual internal development accompanied with progressive areal and regional differentiation. While this point of view does not deny the potential importance of other historical and intercultural events, it will be argued hereafter that it does not place enough emphasis on the processes of diffusion, acculturation, and migration. Thus the six periods which were proposed earlier in this section were based primarily on inferred cultural relationships between the Plateau and surrounding areas, while internal developmental trends were not emphasized.

One of the fundamental points of the Intermontane Western Tradition deals with the relative similarities and dissimilarities seen in the prehistories of the Plateau, Great Basin, and Southwest. Similarities are said to be greatest in the Early period, with progressive differentiation occurring between and within each of these areas during succeeding periods. Again internal development is emphasized in explaining this differentiation. Three comments may be made regarding this point of view.

First, although such regional and areal differentiation appears to have been of particular significance over the last 3,000 years and may also have occurred at a much earlier date, it is nevertheless difficult to evaluate because our recognition of it is closely bound up with the numbers and sizes of samples from each period of prehistory. Thus, differentiation may merely be more apparent during the Late period, a time in prehistory for which we have great amounts of data. In contrast, the Early period is represented by smaller and less numerous assemblages; similarities and differences are thus harder to pinpoint.

Second, we may justifiably postulate that there was considerable differentiation between the Plateau and the Great Basin even during the early period. To be sure, the general level of socio-cultural development is the same and tool assemblages are broadly similar. However, this is also true if we compare the Plateau with other areas of North America, or Early period assemblages with the assemblages of the Transitional and Developmental periods. When we make comparisons between material cultures in the Great Basin and the Plateau we find a few similarities but also many differences. Crescentic forms are a good example of an artifact type with an apparently widespread distribution in the Intermontane West during the Early period, in contrast, however, projectile points are by no means uniform throughout this vast area. In the Plateau stemmed-lanceolate forms with edge-ground bases predominate. Although such projectile points are common at an early time level in the Plains and in such areas as eastern Wyoming (Agogino 1961), they do not appear to be [107] common in the Great Basin. In fact the sequence at Danger Cave (Jennings 1957) implies that corner, base, and side-notched points were more abundant at this time level. Moreover three milling stones and three possible handstones were recovered from Level I at Danger Cave (C14 date of 9500 B.C.) while 122 milling stones and 39 handstones were recovered from Level II (C14 dates of 7840 and 7010 B.C.). To date we have no evidence that food grinding became extremely important in the Plateau until Altithermal times. Thus, we can at least make a good case for considerable differentiation between the Plateau and Great Basin during the Early period.

Third, Great Basin and Plateau assemblages appear to be generally more similar during the Transitional period. This may be attributed in part to migration and/or diffusion from the Great Basin into the southern Plateau.
Differences in the conclusions to which the two models can lead are clearly illustrated by comparing the Northwest Riverine Area tradition with an historical interpretation of the utilization of riverine resources in the Plateau. According to Daugherty's model, riverine adaptation in the Plateau was incipient during the Early period and became generally well established during the Altithermal when increased dessication within the Plateau concentrated population along the courses of major waterways such as the Snake and Columbia rivers. During the Developmental period improved fishing techniques were adopted which further extended the riverine adaptation and set the stage for the culmination of the Northwest Riverine Area tradition during the Late period.

The history of riverine adaptation in the Plateau may be reconstructed in quite another way. While I would agree that during the late Anathennal and possibly the very early Altithermal there were at least heavy local adaptations to riverine situations (see Cressman 1960), these do not necessarily imply a progressive or incipient developing riverine tradition. Elsewhere in the Plateau more generalized hunting and gathering economies were operating. Moreover, fishing evidently declined at The Dalles during the Transitional period.

During the Altithermal groups migrating from the northern Great Basin pushed into the southern Plateau where they adapted their traditional economic systems to the regional situation. Thus techniques which probably developed to exploit the resources of remnant pluvial lakes in the northern Great Basin came to be applied along the rivers and streams of the Plateau. As a result waterfowl and shore-side animals continued to be used while fishing was reduced to a minor subsistence pattern. It may be argued that this adaptation was maintained throughout the Transitional and developmental periods and that as Altithermal climatic conditions abated it became somewhat less important in the total economic round as gathering and hunting were practiced in ever-increasing amounts.

This trend was abruptly changed at the beginning of the Late period with the introduction of new and better fishing techniques and a change in social organization united bands into winter villages and organized the economy in a more efficient manner. Both of these factors are seen as introductions from the western flanks of the Cascade Mountains rather than independent developments within the Plateau.

CONCLUSIONS

These reconstructions, based on a considerable amount of inference and reasoned speculation, have been designed to show that the processes of diffusion, acculturation, and migration could have been predominant factors in shaping the prehistory of the Plateau. Those who stress developmental models may justly criticize some of my arguments on the basis that they overstate the case for historical origins of areal patterns. After all, we must admit that cultures do not borrow elements blindly and that migrating peoples adapt their culture to whatever environment with which they are forced to deal. The truth lies in between. A completely satisfactory reconstruction and explanation of Plateau prehistory must consider changes in prehistoric patterns as due both to changes in the relations between cultures and their physical environments and in relationships between cultures themselves. Much more data are needed before such attempts can successfully be made.
The material culture of the Sunset Creek Site is divided into three areas of investigation: the typology, the presentation of the artifacts, and the uses to which certain raw materials, such as basalt and obsidian, were put. Faunal remains and chipping detritus are discussed in the component descriptions embodied in Part IV of this report.

**TYPOLOGY**

Daugherty's extension of Krieger's typological concept has been used to organize and present the material culture of 45KT28.

Krieger (1944:272) originally stated that "the purpose of a type in archaeology must be to provide an organizational tool which will enable the investigator to group specimens into bodies which have demonstrable historical meaning in terms of behavior patterns." To this concept Daugherty (1956:233) added the terms "form" and "style:"

The term *form* will refer to any single artifact, the emphasis being placed on its diagnostic formal characteristics. If a *form* is found to recur with some regularity and, as such, may have additional cultural significance, it is also designated a *style*. When the temporal, spatial, and relational factors (i.e., historical factors) for a given style have been determined, such a style will then be given a type designation.

These terms have been applied in much their original sense. Thus, individual specimens and small groups which are nonrecurrent through time and space have been assigned the term "form." A form is judged to be of little comparative value.

Groups of artifacts found in temporarally restricted, but differentiated subcomponents of 45KT28 have been assigned the term "style," the assumption being that such a distribution within the site indicates probable use elsewhere, at least in the Vantage locale. The designation "style" also has been applied to groups of artifacts where local comparative material has been reported, or for which there exist a few reports from scattered sites in the Columbia Plateau. Use of the term "style" indicates comparative value on a local level, and potential value on the regional and areal levels.

Ideally a type should be precisely defined in time and space, so that it fills a temporal continuum of known duration and occurs in a spatial unit no smaller than the region (Willey and Phillips 1958:19). In the strict sense, it is impossible to apply this exacting a definition to artifact assemblages from the Plateau because most present knowledge of the area is derived from historical documents, ethnographies, site surveys, and unintegrated site reports. Local sequences are emerging, however, in areas such as The Dalles (Butler 1958a, 1961; Caldwell 1958; Cressman 1960), the Vantage locale (Swanson 1956, 1958, 1962a; Crabtree 1957; Osborne 1956-57), and along the Snake River (Fryxell and Daugherty 1962). Although these, coupled with a growing body of data from other areas of the Plateau, are sufficient for the postulation of hypotheses, they are not an adequate sample for the precise delineation of individual artifact types. Therefore, the designation "type" has been assigned to those classes of artifacts which are temporally defined at 45KT28 and spatially restricted to no smaller an areal unit than the region, under the assumption that such artifacts are culturally related to their counterparts elsewhere in the Plateau.

In addition, a fourth typological term, the "type variant," has been employed for subdividing types to smaller, potentially meaningful units. Hence any given type includes the type variants within it, and any miscellaneous specimens which fall within the type as a whole but do not correspond to any particular type variant.

It must be remembered that the application of these designations (form, style, type, and type variant) concerns individual artifacts and not gross generalizations about the shapes or manufacturing techniques apparent in assemblages of artifacts. Thus a form - a leaf-shaped projectile point of divergent shape and size, for example - may be of little use in across-the-board artifact comparisons. Yet, if it occurred in a component characterized solely by leaf-shaped points, the fact that it, too, was leaf-shaped would have a measure of significance. Conversely, if it had come from a component from which no other leaf-shaped points were recovered, it would be significant as a strike[110]ingly deviant form. The frequency of forms, as well as styles and types, and the nature of their divergence from the norm might well be of value in studying instances of prehistoric acculturation, the manner in which the individual viewed and interpreted his particular culture, and the processes, or at least rates, of innovation in specific communities and cultures.

The problems which these distinctions pose involve different levels and kinds of abstraction. The designations form, style, type, and type variant are designed to call the researcher's attention to the value of artifacts in across-the-board comparative studies.

Typological classification was accomplished by working concurrently with the morphology and provenience of the artifacts. 1. The artifacts were sorted into morphologically similar groups. At this stage splitting was the rule of thumb, and the resultant classes were many. 2. Temporal distribution for each class was determined and morphologically similar groups compared. Those with identical or nearly identical distribution patterns were combined, while those exhibiting dissimilar patterns were left unaltered. Cases arose, of course. In which it was difficult to justify either the lumping or splitting of classes. 3. In such cases archaeological literature was searched for significant comparisons. Temporal-morphological clines between the disputed groups were sought, and the general problems of the degree of morphological differences and potential comparative value considered.
After these classes had been established, they were analyzed in the light of Plateau and, on occasions, coastal archaeology. When it had been determined to what extent they appeared related to artifacts from these areas, each group was assigned an appropriate typological designation.

The typological classes which resulted then were arranged for presentation by the use of a purely descriptive classification involving three levels of organization, designed to integrate the individual typological classes. On the first level, the material culture is divided into a few large categories, determined by a general consideration of material, technique, and function. Bone and antler, chipped stone, metal, shell artifacts of trade, ground adzes, basalt spall scrapers, and ground stone ornaments are representative examples. Although in some measure arbitrary, each such category was chosen with a definite purpose in mind. For example, bone and antler artifacts were treated as a unit because many typological classes included specimens of both materials. Moreover, previous studies have made particular note of their distribution, relative both to each other and to other gross categories of material culture. Another good example is that of the shell artifacts, the majority of which were articles of trade originating at various points along the Pacific coast.

Each of these primary categories has been subdivided into a number of groups determined by the inferred function of its members. Thus, the bone and antler category is composed of numerous groups with titles such as splitting wedges, awls, flaking tools, and hafts. Description at this level is designed to record and discuss data about functionally related classes of artifacts.

With few exceptions each group based on artifact function has been divided into several typological classes or assigned to a single typological class. The exceptions are fragmentary artifacts which cannot be assigned specific typological designations.

Each typological group of artifacts has been described by means of following a standardized form: (a) number of specimens, (b) material, (c) measurements and description, (d) technique of manufacture, (e) comments, (f) distribution, and (g) comparable specimens. Though some of the headings are entirely self explanatory, others require amplification and are described below.

*Measurements and description.* Measurements and morphological descriptions of artifacts define the range of variation within any given group, as well as its modal configuration. If a typological class contains less than four complete artifacts, measurements for individual specimens are recorded separately. Any measurement which does not express the true dimension of an artifact, i.e., the true length, width, or thickness, is preceded by an asterisk (*). In cases where all the artifacts in a group are fragmentary, estimated measurements (clearly marked as such) are offered. If a group is composed of more than complete artifacts, measurements are given in the form of extremes -and modes for the group as a whole. Such figures are based solely on complete artifacts. Thus, if the group is composed of eight specimens five of which are complete, the statistical figures presented are based on those five [111] artifacts alone. Appropriate notes are inserted when it is apparent that an incomplete specimen does not fall within the range defined by the rest of the group.

It should be noted that modal and not mean, or average, figures are used in this report, for it is the mode which records that which is most frequent or typical within any group. Archaeologists in the Northwest have used mean figures to describe both normal and skewed populations, as well as groups containing too few individual specimens to derive a statistacally meaningful mean.

*Comments.* Though primarily designed to record comments about the significance and distribution of artifact types, this heading also subsumes items of information which do not readily fall under any of the other headings.

*Distribution.* The seven Roman numerals recurrently listed under this heading represent cultural components. "I" is the earliest and "VII" the latest. Cultural Component VII has been further divided into a series of subcomponents, each represented by an Arabic letter. "A" is adjudged earliest, "L" latest. Unfortunately, about 25 percent of the artifacts recovered from Cultural Component VII could not be assigned to specific subcomponents, and have, therefore, been listed under the term "undesignated" (und.). Whenever possible, stratigraphic limits for these undesignated specimens are given; e.g., a specimen may postdate Subcomponent VIIA and antedate Subcomponent VIIH.

*Comparable specimens.* "Comparable specimens" include only those examples for which published illustrations are available. These references are designed to extend the number of illustrations for any given typological class.

The cultural components have been divided among four phases which are represented in the Vantage area. Cultural Components I and II represent the Vantage Phase; Cultural Components III, IV, and V are assigned to the Frenchman Springs Phase; Cultural Component VI to the Quilomene Bar Phase; and Cultural Component VII to the Cayuse Phase. The Cayuse Phase has been further subdivided into three subphases. Subcomponents VIIA through VIID represent the Cayuse I Subphase; Subcomponent VIIE may represent either the Cayuse I or Cayuse II Subphase; Subcomponents VIIF and VIIG define the Cayuse II Subphase at the site; and Subcomponents VIIH through VIII are assigned to the Cayuse III Subphase.

THE ARTIFACTS

A total of 4,657 artifacts were recovered from the Sunset Creek Site. These are discussed and classified according to typological units in this section of the report. Complete component catalogues may be found in the main body of the report where the cultural components are dealt with separately.

CHIPPED STONE ARTIFACTS
Artifacts commonly or exclusively manufactured from cryptocrystalline silica, including occasional specimens made from obsidian and basalt which are clearly in the same technological tradition, are defined as chipped stone artifacts, and include projectile points, knives, core tools, scrapers, gravers, drills, utilized flakes, and micro blades. Other flaked implements are discussed under the headings of basalt spall scrapers, cobble scraping planes, miscellaneous flaked cobble tools, crushing implements, and notched net weights.

Members of the chipped stone category were by far the most numerous in every component and subcomponent of the site, accounting for 3,867 of the artifacts. As a group they occupy a place of importance not only because of their numbers, but also because they form most of the significant typological classes upon which present interpretations of Plateau culture history are based. This is particularly true of projectile points and knives, and accordingly the discussion of the chipped stone artifacts will begin with these.  

**Distribution of chipped stone artifacts.**

<table>
<thead>
<tr>
<th>Component</th>
<th>Count</th>
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<tr>
<td>VII:</td>
<td>A, 764; B, 233; C, 79; D, 127; E, 32; P, 63; G, 117; H, 254; L, 111; undesignated, 788</td>
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<td>VI:</td>
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<tr>
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<tr>
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<td>IV:</td>
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<tr>
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<td>8</td>
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<td>I:</td>
<td>61</td>
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<tr>
<td>und:</td>
<td>25 (resting on I)</td>
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<tr>
<td>und.</td>
<td>1 (below I)</td>
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<tr>
<td>und.</td>
<td>5 (beach slough)</td>
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</table>

**Stemmed Projectile Points.** A total of 772 stemmed projectile points were recovered. They have been divided into 11 types and 11 forms, the relative distributions of which may be seen in Table 1. These implements were analyzed and categorized in the following manner.

Projectile point forms and point-like knife forms from the Vantage region are virtually impossible to separate into distinctive groups on a purely morphological basis. For example corner and base-notched points, which are particularly common in the area, grade imperceptibly from one form to another, and almost any given group may be divided into a countless number of discrete shapes which can be easily arranged to a continuum in such a fashion that points separated by 25 or more specimens will be quite different from one another, even though each specimen in the continuum practically duplicates its immediate neighbors. This continuum may be expanded until it includes triangular, side-notched, corner-notched, simple-stemmed, and leaf-shaped points. In fact, it might be described as an unbroken circle encompassing every common projectile-point form characteristic of the Middle and Upper Columbia.

There are three steps by which this continuum may be broken down into meaningful units. First, morphological forms arranged along the continuum must be plotted against their frequency, thus providing a means to assess the rate of morphological change within the continuum. In some sections of this continuum change is marked; other areas might be described as morphological plateaus in which there is little difference among large numbers of specimens. Such plateaus, or high points in the frequency distribution curve, suggest meaningful groups. When correlated with specific cultural components at a series of sites, the morphological plateaus may be segregated into meaningful, though often complicated, historical patterns. Finally, assemblages representing these plateaus take on a full measure of significance when viewed in the context of temporal-spatial clines and associated cultural assemblages.

In this three-dimensional structure of temporal, spatial, and morphological axes, it cannot be expected that perfect correlations will always be found. This is particularly true when dealing with comparatively subtle morphological changes on the level of the subphase. In such cases significant types or type variants may be similar enough so that a mistake in the manufacture of one will produce the other. Individual interpretation of group norms, innovation, and trade also tend to complicate the picture, especially in an area such as the Plateau which appears to have been host to many similar, but archaeologically distinct regional developments over at least the last 2,000 years of prehistory, and possibly for a much greater period of time.

Much of the morphological continuum of stemmed projectile points has been subdivided in an effort to analyze cultural relationships in the Plateau during the Cayuse Phase. This is true of Types 6 through 11, and of all the variants into which these types have been divided. On the other hand, Types 1 through 5, and the triangular, semi-triangular, and leaf-shaped points and knives all have been developed as tools for the analysis of earlier phases.

Because many descriptive terms applied to stemmed projectile points still are disputed, a few minimal definitions are suggested below.  

Most of the terms used in this section of the report, such as concave, convex, plano-convex, straight, square, round, pointed, serrated, and the like, are generally accepted units of typological description. There remain, however, more equivocal terms such as barb, tang, notch, stem, base, and stem indentation. In this report these terms have been used consistently in relationship to the two major techniques of manufacturing stemmed points in the Vantage locate. The first of
these major techniques was applied to stemmed and shouldered points, that is, points without barbs or notches. Stemmed and shouldered points were manufactured directly from flakes or crudely prepared blanks by a single-step flaking of the blank's entire periphery, in which the manufacture of the stem created both the point's shoulders and base. In this context the stem is defined as that portion of the projectile point which lies between the shoulders and the area (lying on the central axis of the point) farthest from the point's tip. The latter area is termed the point's base. Among such points stems may be parallel sided (Fig. 41, n-r) or contracting (Fig. 41, b-d), and their bases convex (Fig. 41, a, b, g, h), straight (flat) (Fig. 41, i, l, n, o), or pointed (Fig. 41, d, x). Shoulders are said to be tanged if, at the shoulder, there is a noticeable, and evidently deliberately made projection (Fig. 41, i, j, o, v). In all cases, adjectives such as slightly and deeply are used to indicate the degree and intensity of trait occurrence.

In contrast to stemmed and shouldered points, side-notched points and stemmed and barbed points are manufactured on well-prepared triangular blanks which themselves could be utilized as projectile points. The final step in the process of manufacture is notching, not shaping. In stemmed and barbed points, the base of a finely made, triangular point blank is notched, producing barbs and a stem. If the notches are clearly placed in the base of the triangular blank, the finished product is termed a base-notched point (Fig. 38, a-e); if they are clearly at the corner, the completed specimen is a corner-notched point (Fig. 38, f, i-k, 1). Intermediate forms frequently occur. In all such points the stem is defined by the inner edges of the notches. It may be expanding (Fig. 38, 1-p), parallel sided (Fig. 38, c), or, on rare occasions, contracting. The base of stemmed and barbed points is defined as the basal remnant of the triangular blank which remains between the two notches. It may be concave, convex, straight (flat), or even pointed. When this portion of the point is indented with a small notch, the point may be described as stem indented (Fig. 38, a, l-q; Fig. 39, g, j, m, o, s-t). The terminology for side-notched points is analogous.

Type 1. Points with Slight Shoulders and Rudimentary Stems (Figs. 8, j; 11, m-o; 37, a-d)

Number of specimens. 4.

Material. One is basalt and derives from Cultural Component III; the others are cryptocrystalline silica.

Measurements and description. The specimens of this type have broad convex bases and weak, but distinct shoulders forming a stem nearly as broad as the point itself. They possess convex edges, thick lenticular cross sections, and parallel-sided or very slightly contracting stems. The edges of the stem of the basalt specimen which measures 4.8 x 1.95 x 0.9 cm., appear to be very slightly rubbed or ground. Two of the remaining specimens are complete. One, with a blunt tip, measures 6.0 x 2.8 x 0.9 cm., the other 5.0 x 2.1 x 1.05 cm.

Technique of manufacture. The points appear to have been manufactured by means of percussion, though pressure flaking may have been used in retouching the edges. The remnants of striking platforms appear at the bases of b and c in Figure 37, suggesting that some may have been manufactured on blades or blade-like flakes.

Comments. To date, points of this type have been found in but small numbers in the Plateau. Swanson (1962a: 145, m-n) has reported two, one deriving from what he terms Frenchman Springs I, the other from Frenchman Springs III. Swanson estimates one about 4,000 years old, the other about 2,000. At Mamies Rockshelter, a site located where the Palouse and Snake rivers converge, similar specimens have been recovered from beneath Mazama ash and are associated with C-14 dates well in excess of 6,500 years. At 45KT28 one derives from Cultural Component II and three from Cultural Component III. Components roughly comparable in age with Swanson's Frenchman Springs I. [114]

Distribution. Comparable specimens.

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<td></td>
</tr>
<tr>
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</tr>
<tr>
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<tr>
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<td></td>
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<tr>
<td>II</td>
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<td>I</td>
<td>8</td>
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</tbody>
</table>

Type 2. Cold Springs Side-Notched Point (Fig. 37, p-q)

Number of Specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. Each of these points possesses convex edges, broad side notches, and a slightly convex base. Only one is complete, measuring 2.9 x 2.0 x 0.6 cm. The notches of this specimen are well defined and the base slightly serrated. The other is fragmentary, measuring *2.3 x 2.4 x 1.65 cm.; its side notches are shallow and poorly defined.

Technique of manufacture. The fragmentary specimen seems wholly the product of percussion flaking, with the possible exception of retouching along the edges. The complete specimen may have been produced by pressure or percussion, or very possibly a combination of both.

Comments. This point type takes its name from what Butler (1961:33-36) has termed the Cold Springs Horizon,
the type site for which yielded a number of large side-notched points in deposits immediately overlying an unidentified volcanic ash (Shiner 1961). This horizon also occurs along the Snake River in a floodplain site, 45FR32, and at Marmes Rockshelter at the mouth of the Palouse River (Fryxell and Daugherty 1962). Here it occurs directly overlying Mazama ash, and is estimated to date from around 4,000-5,000 B.P. (Daugherty 1963: personal communication). There is a C-14 date of about 4200 B.P. associated with a similar component at 45YK5, a site on the Middle Columbia (Greengo 1963: personal communication). A single specimen was also reported for 45LN3, a site along Crab Creek in the Vantage area, where it was stratigraphically associated with early leaf-shaped points (Bryan 1955). At all these sites, associated artifacts have commonly included Cascade points and, at least in the case of Marmes Rockshelter, rudimentary stemmed points (see Type I). The material of manufacture is commonly basalt.

The specimens from 45KT28 differ from those just described in three ways. First, the morphological form is not quite the same. Second, they are made of cryptocrystalline silica. And third, they are associated not only with leaf-shaped and rudimentarily stemmed points, but also with rudimentary corner-notched and Rabbit Island Stemmed points. Because of their general form, their early occurrence at the site, and the fact that three other projectile points from the component were manufactured of basalt, we may still consider these points connected historically to the Cold Springs Phase.

Type 3. Rabbit Island Stemmed Point (Figs. 11, s; 13, c, 1-m; 14, a-f; 37, e-k)

Number of Specimens. 12.

Material, Cryptocrystalline silica.

Measurements and description. The specimens in this group possess straight to slightly convex edges, square shoulders which occasionally are laterally tanged (Fig. 37, g), and stems which may contract to a pointed or rounded base, or which are parallel sided with a slightly convex base. The tip of one specimen has been removed and flaked into a chisel-like bit (Fig. 14, a). It measures 3.5 x 2.0 x 0.8 cm. Three other specimens were complete, measuring 3.1 x 1.3 x 0.5 cm., 3.7 x 1.65 x 0.3 cm., and 2.7 x 1.2 x 0.8 cm. The larger specimens are all fragmentary. The largest would probably have measured about 4.4 cm. in length and 2.5 cm. in width.

Technique of manufacture. These points are either pressure flaked or very finely percussion flaked.

Comments. The type site for these projectile points is located in the McNary Reservoir, a few miles downstream from the confluence of the Snake and Columbia rivers. Here the Rabbit Island Stemmed points occurred in association with burials which were overlain by a stratum of volcanic ash of undetermined age and origin. Cultural assemblages associated with Rabbit Island I and nearby pre-Mazama sites, such as Cold Springs and Hat Creek, suggest that the volcanic ash at Rabbit Island is not a primary deposit of Mazama or any other volcanic ash of greater age. On the other hand, this same assemblage, style of burial, and its stratigraphic occurrence beneath recent Plateau materials suggest that Rabbit Island I antedates the emergence of Plateau culture some 2,000 years ago. Based on the presence of a small number of Rabbit Island Stemmed points in early post-Mazama deposits along the Snake River (Richard Daugherty and Roger Nance 1963: personal communication), I would estimate their appearance in the southern Plateau at about 4,000 years ago, despite the occurrence of one such projectile point in the assemblage from Indian Well I (Butler 1961: Fig. 3A, c), which is estimated to date from between 8,000 and 11,000 years ago (Butler 1961; 1962a:77).

In the Vantage region, five sites have been reported which have produced Rabbit Island components. The first of these is 45GR27, a site located near Moses Lake (Daugherty 1952). Two others, the Sahlkop and Schakea Village Sites near Vantage, have been reported by Swanson (1962a; 1962b), who assigns one to Frenchman Springs I and the other to Frenchman Springs III. These subphases are estimated by Swanson to have occurred between 4,000 and 2,000 years ago (1962a:31). A fourth site is 45KT28, where the Rabbit Island Stemmed point is the predominant type in Cultural Component V and also occurs in Cultural Components III and IV. The fifth site is located in the Ellensburg Canyon at the mouth of Umtanum Creek and has been reported by Rice (1969). These components together represent the Frenchman Springs phase and are estimated to date from between 3,000 and 4,000 years ago.

As in the southern Plateau, in the Vantage locale Rabbit Island Stemmed points appear to be introduced on the heels of the Cold Springs Side-Notched Point. In as much as the latter type is perhaps as much as 1,000 years older in the southern Plateau than in the Vantage locale, it also is likely that Rabbit Island Stemmed points appear first in the south from whence they spread northward.
Rabbit Island Stemmed points also may be historically connected with identical points now being recovered from western Washington. Formally reported specimens are few, being restricted to those from 45IS31b (Nelson 1962a) and 45SN100 (Nelson 1962b). There is but one specimen from 45IS31b. It is basalt and was associated with both triangular and leaf-shaped points (Bryan 1963:28-34). Five specimens have been recovered from 45SN100, where they are associated with large base- and corner-notched points (see Type 6). They are the only chipped stone artifacts of basalt and appear to be trade items (Nelson 1961b:31-32). Although it is unlikely that these specimens exceed 2,500 years in age, private surface collections from along the Puget Sound Basin indicate that components must exist which are characterized almost entirely by cryptocrystalline and obsidian points comparable in size and shape to those illustrated by Crabtree from the type site at Rabbit Island (1957: PI. IX, g-i). In addition, these points have come from Whidbey and Camano Islands in the form of many isolated surface finds. However, none of the many shore-side sites in the area have produced any comparable cryptocrystalline points or any evidence for a crypto-crystalline silica flaking industry. Therefore, associated sites must lie in a different relationship to the present shoreline and hence are older than any of the known shore-side sites, possibly in the magnitude of 2,000 to 4,000 years. This, as well as other evidence (see Leaf-shaped Points, Type 1 and Stemmed Points, Type 5), suggests a close developmental link between the Puget Sound Basin and either or both the fringes of the western Plateau and the Lower Columbia area.

In the Vantage locale, Rabbit Island Stemmed points disappeared at about 800 B.C. and are replaced by Quilomene Bar Base-Notched points. However, a whole complex of stemmed points, including many which duplicate the Rabbit Island Stemmed, is reintroduced in very late prehistoric times (see Type 8). These late stemmed points are derived from The Dalles area (see Type 8 and the Cayuse III Subphase), where they occur continuously from about 800 A.D. to historic times (Caldwell 1956). Because we have, as yet, no adequately developed point sequence for The Dalles, it is not known if these late stemmed points are direct descendants of the Rabbit Island Stemmed points. Although they are almost certain to be ultimately related, the unknown nature of this link and the different historical functions they perform at different time levels along the Upper Columbia justify their discussion under two type headings.

**Distribution.**

| III: | 0 | Crabtree 1957: Pl. IX, g,l |
| V: | 0 | Swanson 1962a: Fig. 36, e-f |
| V or IV: | 7 | Swanson 1962B: Fig. 4, a-d |
| IV: | 3 | Daugherty 1952: Fig. 14b, 6 |
| III: | 1 |
| II: | 0 |
| I: | 0 |

**Type 4. Rudimentary Corner-Notched Points** (Figs. 11, p-r; 14, g; 37, 1-o)

Number of specimens. 4.

**Material.** Two are of basalt, one is of obsidian, and one 8 cryptocrystalline silica. The obsidian and basalt specimens derive from Cultural Component III.

**Measurements and description.** Morphologically the specimens in this group fall between the Rabbit Island Stemmed point (Type 3) and the large corner-notched points of Type Variant 5C. Thus they possess straight to slightly convex edges, shoulders which are square or nearly so, and a slightly expanding stem whose base is slightly concave or straight. The cross section is lenticular. Two of these specimens are complete. They measure 4.4 x 1.8 x 0.65 cm., and 5.0 x 2.9 x 0.5 cm., and possess width/length ratios, respectively of .409 and .580.

**Technique of manufacture.** Pressure, percussion, or a combination of both techniques may have been used in forming these specimens.

**Comments.** The specimens in this type represent the earliest manifestation of corner notching at the site and may represent a "morphological" reaction to the introduction of the Cold Springs Side-Notched Point (Type 2). A similar change in form occurred at Marmes Rockshelter in the southern Plateau between 4,000 and 5,000 years ago (Fryxell and Daugherty 1962: 21). [117]

**Distribution.**

| III: | 0 | None. |
| III: | 0 |
| IV: | 0 |
| III: | 3 |
| II: | 0 |
| I: | 0 |

**Type 5. Quilomene Bar Base-Notched Point** (Figs. 14, h-i; 15, a-d; 38)

Number of specimens. 58.
Material. Fifty-seven are of cryptocrystalline silica and one, from Cultural Subcomponent VIIA, is of obsidian.

Measurements and description. These points are large, with a thick, lenticular cross sections, straight or slightly convex edges, deep base or corner notches, and an expanding stem whose base is usually straight or slightly convex. They commonly range in length from 2.5 to 5.0 cm. and in width from 1.7 to 2.7 cm. More detailed measurements accompany the descriptions of the various type variants.

Technique of manufacture. First a triangular blank was prepared by means of pressure and/or percussion flaking. It was then notched at the corners or in the base, procedures which produced respectively, pointed and square barbs. This process is revealed by a few, presumably unfinished specimens such as that in Figure 38, e. After completion, the stem might be slightly indented (Fig. 38, a, l-q), a feature which occurred only during the Cayuse Phase.

Comments. This point type is the identifying characteristic of the Quilomene Bar Phase, from whence it derives its name. It appears first, however, in association with Rabbit Island Stemmed points in Cultural Component V and persists throughout the Cayuse Phase down into historic times. During the Quilomene Bar Phase it is overwhelmingly predominant and nearly always base notched. During the Cayuse Phase it is more often corner notched and is of relatively minor importance, comprising about 15 percent of the total number of stemmed projectile points in Subcomponent VIIIA and only about 2 percent in VIIH and VII-I (Table 1). These figures suggest a steady decline of the type during the Cayuse Phase.

The designation of the specimens in this group as a type rests mainly upon their distribution at 45KT28. However, some comparable phase material appears to be present at Schaake Village (Swanson 1962b: Bed B3) and at Sam's Cave, near Steamboat Rock (Osborne:121-37). In addition, identical points are characteristic of a site on the Snoqualmie River in western Washington (Nelson 1962b). Their occurrence at this site suggests that a developmental link may exist between the point traditions along both flanks of the Cascade Mountains.

Distribution.

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</thead>
<tbody>
<tr>
<td>A, 16; B, 4; C, 1; D, 2; E, 2; F, I; G, 2; H, 3; I, 8; L, 1; undesignated, 8</td>
<td></td>
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</tbody>
</table>

Comparable specimens.

Collier, et al. 1942: Pl 3, s, w
Mills and Osborne 1952: Fig. 107, p-q
Nelson 1962b: Fig. 9
Osborne 1959: Pl. VI, s, t, z, ee, ff
Swanson 1962a: Fig. 32, d
Swanson 1962b: Fig. 4, e-f

Type Variant 5A. (Figs. 14, i; 15, a-d; 32, h; 38, a-e)

Number of specimens. 19.
Material. Cryptocrystalline silica.

Measurements and description. The projectile points in this type variant are large and rugged in appearance. They possess thick, lenticular cross sections, straight edges, square barbs, and a slightly expanding stem whose base may be slightly concave, straight, or slightly convex. One specimen is stem indented, and another has slightly recurved edges.

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<tr>
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<tr>
<td>Extremes</td>
<td>2.35-5.3</td>
<td>2.3-3.2</td>
<td>0.4-0.7</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. This type variant, the hallmark of the Quilomene Bar Phase, first appears in late Frenchman Springs time and remains a part of the cultural inventory until historic time.

Distribution.
The undesignated specimen probably derives from Cultural Component VI.

Comparable specimens.

Mills and Osborne 1952: Fig. 107, p-q
Nelson 1962b: Fig. 9, g-l
Osborne 1959: PI. VI, ee-ff

Type Variant 5B (Figs. 14, h; 15, m; 38, f-i)

Number of specimens. 14.

Material. Cryptocrystalline silica. [119]

Measurements and description. Though still very sturdy, the specimens in this group tend to be slightly smaller than those of Type Variant 5A. They have slightly convex edges, small rounded barbs, deep corner notches, and an expanding stem whose base is usually straight, though occasionally slightly concave or convex. The cross section is lenticular. None of the specimens has a basal indentation.

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<td>Extremes</td>
<td>3.0-4.8</td>
<td>1.7-2.7 0.4-0.7</td>
</tr>
<tr>
<td>Modes</td>
<td>3.2-3.4</td>
<td>1.9-2.1 0.5</td>
</tr>
</tbody>
</table>

In addition, one specimen not included in summary above, measured 5.3 x 1.9 x 0.5 cm. It comes from the very top of Component VI and is transitional in form to Type 6 (Fig. 15, m).

Technique of manufacture. See major type description.

Comments. The earliest of these specimens is late Frenchman Springs and may be considered morphologically intermediate between rudimentary corner-notched points (Type 4) and the fully developed Quilomene Bar Base-Notched (Type Variant 5A). After the development of Type Variant 5A, they must have played at best a minor role until late in the Quilomene Bar Phase at which time they were probably manufactured in greater numbers and with a variety of forms. During the Cayuse Phase they continued to be produced in small quantities.

Distribution.

| VII:  | A, 3; B, 3; D, 1; E, 1; I, 2; L, 1; Undesignated, 1 |
| VI:   | 1 |
| V:    | 1 |
| IV:   | 0 |
| III:  | 0 |
| II:   | 0 |
| I:    | 0 |
| Und.: | 1 |

Comparable specimens. Nelson 1962b: Fig. 9, a, b, d, e

Type Variant 5C. (Figs. 25, a-b, e; 38, l-p, r-s)

Number of specimens. 11.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this category possess straight edges, pointed or slightly rounded barbs, and a broad expanding stem whose base is convex. The cross section is lenticular and 7 of the 11 specimens possess stem indentations.

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<th>Thickness</th>
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</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>2.7-5.0</td>
<td>2.2-3.05 0.4-0.7</td>
</tr>
<tr>
<td>Modes</td>
<td>2.7-3.3</td>
<td>2.2-2.7 0.5</td>
</tr>
</tbody>
</table>

Two fragmentary specimens in this group would probably have exceeded 5.0 cm. in length.

Technique of manufacture. See major type description.

Comments. If the distribution at 4SKT28 reflects a general picture for the Vantage Region. Type Variant 5C
should be present in small quantities during the Cayuse I and Cayuse II subphases, but absent or rare during the Cayuse III period.

**Distribution.**  
*Comparable specimens.* None.

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<th>VII:</th>
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<th>III:</th>
<th>II:</th>
<th>I:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A, 5; E, 1; F, 1; G, 1; H, 1; undesignated, 2</td>
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<td>0</td>
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</table>

One of the undesignated specimens antedates Subcomponent VIIG; the other is slightly post VIIA, but still within the Cayuse I period.

**Type Variant 5D** (Figs. 25, d; 32, j; 38, j-k)

*Number of specimen.* 6.

*Material.* One, from VIIA, is of obsidian; the rest are cryptocrystalline silica.

*Measurements and description.* These specimens possess straight or slightly convex edges, rounded barbs which approach being little more than shoulders, and narrow, expanding stems whose bases are convex. The cross section is lenticular. One specimen possesses a base which, instead of being simply convex, forms a point.

Only three of these specimens are complete. They measure 3.3 x 1.6 x 0.4 cm., 4.0 x 2.4 x 0.6 cm., and 3.6 x 2.5 x 0.4 cm.

*Technique of manufacture.* See major type description.

*Comments.* None. [121]

**Distribution.**  
*Comparable specimens.* None.

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</thead>
<tbody>
<tr>
<td></td>
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</table>

One of the undesignated specimens antedates VIII, being either Cayuse I or II in age. The other postdates VIIG and is Cayuse II in age.

**Type 5. Quilomene Bar Base-Notched. Miscellaneous Specimens.** (Figs. 25, c; 38, q, t-v)

*Number of specimens.* 8.

*Material.* Cryptocrystalline silica.

*Measurements and description.* This group is composed of miscellaneous specimens, most of which are pictured in Figure 38, where each is accompanied by its provenience. All fall within the general type designation and have lenticular cross sections.

*Technique of manufacture.* See major type description.

*Comments.* None. [121]

**Distribution.**  
*Comparable specimens.* None.

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</table>

**Type 6. Columbia Plateau Corner-Notched Point** (Fig. 39)

*Number of specimens.* 503.
Material. Cryptocrystalline silica.

Measurements and description. These specimens possess concave, straight, or slightly convex edges, barbs which are pointed, round, or square, and a stem which is usually slightly expanding, frequently parallel sided, and very occasionally contracting. The base of the stem is usually slightly convex, although it may also be flat, particularly if the stem is broad. Small notches in the base of the stem are quite common in the larger specimens, but rare in the smaller ones. Commonly the specimens of this group vary from 2.0 to 4.0 cm. in length and 1.5 to 2.5 cm. in width.

Technique of manufacture. These specimens were manufactured from small flakes by means of pressure flaking. In almost every case a small, triangular blank was prepared and then notched at the corners or in the base.

Comments. The type designation "Columbia Plateau Corner-Notched" is a proposed modification of the designation "Middle Columbia Basal-Notched" proposed by Osborne, Bryan, and Crabtree (1961). The designation "Columbia Plateau Corner-Notched" recognizes the wider area in which the type occurs and indicates that comer notching is more common than base notching.

This type is the hallmark of the Cayuse Phase and the form most closely identified with the emergence of Plateau culture. It has been recovered in virtually every part of the Plateau as well as in adjacent territories to the south and east, and appears to be most abundant along the Middle Columbia, the Lower Snake River, and the lower half of the Upper Columbia. Although we lack the knowledge to make precise statements about the genesis and spread of the Columbia Plateau Corner-Notched, it presently appears to have originated somewhere in the western Plateau or the foothills of the Cascades which lie adjacent to that area. Age estimates for the beginning of the Cayuse Phase and introduction of the Columbia Plateau Corner-Notched in the western Plateau currently run at about 2,000 years, a figure based on geological evidence and scattered C-14 dates ranging from a few years B.C. to about 500 A.D. For the Vantage Region there is a published date of A.D. 250 (American Antiquity 1962: Notes and News).

This type has been subdivided into nine type variants whose distributions are presented in Table 2. Type Variants 6A and 6B appear to be of particular importance in the Vantage Region. They were evidently introduced at the beginning of the Cayuse 11 Subphase, after which they became exceedingly abundant in the Cayuse III Subphase, where together they constitute about 55 percent of Type 6 projectile points. The remaining type variants are distributed in an inverse proportion to these figures and appear to be present throughout the Cayuse Phase. [122]

Distribution.

<table>
<thead>
<tr>
<th>Distribution</th>
<th>A</th>
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<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>L</th>
<th>Und..</th>
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<td>7</td>
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Comparable specimens.

- Butler 1962a: Fig. 9, h; Fig. 19, b-c
- Caldwell 1953-54: 18
- Caldwell 1956: Type IA
- Clinehens 1960: 55, a; 70, h, f
- Collier et al., 1942: PL. 3, j, t, v, x
- Cressman 1960: Types IN, UK, IIIB, HID, HIE, IIIF, IIIG, III-I
- Daugherty 1952: Fig. 114b, 11
- Gunkel 1961: Fig. 25, d, i, aa, bb, ii-pp
- Gruhn 1961a; Fig. 2, j, 1
- Grohn 1961b: PL. 14, v-x; PL. 36, 1
- Lee 1955: Fig. 2, 3-4, 6-8, 31
- Mallory 1962: PL. IX, a-b
- Miller 1959: Types 6-8
- Mills and Osborne 1952: Fig. 107, o, bb
- Osborne 1956-57: PL A-13, 3, 4
- Osborne 1957: PL. 14a, 19-22, PL. 22, 27, 33, 34
- Osborne, Bryan and Crabtree 1961: PL. 50b, 71, 76, 75; PL. 56, middle row
- Osborne and Crabtree 1961: Fig. 7b, 2-17; Fig. 9a, 225
- Osborne, Crabtree and Bryan 1952: Fig. 110, k, v
- Osborne and Shiner 1951: PL. 1, 27
- Shiner 1953: Fig. 2
- Shiner 1961: PL. 46a, top row
- Smith 1910: PL II, e
- Sprague 1960: Figs. 14, 16
Type Variant 6A. (Figs. 32, o-r; 39, a-h)

Number of specimens. 162.

Material. Cryptocrystalline silica.

Measurements and description. The specimens of this type variant are characteristically small with straight slightly concave edges, and a very slightly expanding or parallel-sided stem whose base is rarely indented. Twenty-five specimens possessed convex edges. Barbs were usually pointed or rounded, being square in only five instances. The specimens in this group are on the border between corner-notched and base-notched points, with a few specimens failing clearly into each category.

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<td>1.1-2.2</td>
<td>0.2-0.6</td>
</tr>
<tr>
<td>Modes</td>
<td>1.9-2.5</td>
<td>1.3-1.9</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. Because this type variant has never been treated as a specific variant elsewhere in the Plateau, it is not possible to comment on its precise distribution within the whole Plateau. At 45KT28 a few forms derive from the Cayuse I Subphase. These may be fortuitous accidents resulting from the manufacture of similar forms during the same period. During the Cayuse II Subphase they appear as a definite tradition, and in the Cayuse III period become quite common, accounting for about 55 percent of all Type 6 points manufactured and 30 percent of all stemmed points.

Distribution.

<table>
<thead>
<tr>
<th>Component</th>
<th>A, 6; B, 1; F, 2; G, 4; H, 25; I, 103; L, 5; undesignated, 16</th>
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<tr>
<td>VII</td>
<td>2; G, 1; F, 2; G, 4; H, 25; I, 103; L, 5; undesignated, 16</td>
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<td>II</td>
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<td>I</td>
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</table>

Of the 16 undesignated specimens, two are disputed between VIH and VIIC, one between VUA and VHA, two antedate VUG by an unknown amount of time, six were recovered in fill overlying VUG, one antedates VHJ by an unknown amount of time, one was recovered in the fill above VIIE, two occurred in fill above VIIF, and one in fill between VIIE and VIIF. Thus, of these 16 specimens, one is Cayuse I, nine are Cayuse II or III, three are disputed between Cayuse I and III and are probably Cayuse III, and three are Cayuse I or II. Thus the undesignated specimens do not confute the distribution among the designated subcomponents.

Comparable specimens. See major type description.

Type Variant 6B. (Figs. 32, k-n; 39, p-r)

Number of specimens. 22.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group are short, wide points which are symmetrical and very well made. Their edges vary from straight to slightly convex. The barbs, which commonly do not equal the length of the stem, usually are pointed or slightly rounded. Two, however, are square. In all cases the stem is expanding; its base may be straight or convex. Three specimens have stem indentations. The cross section is lenticular.

<table>
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<tr>
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<td>Extremes</td>
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<td>0.2-0.5</td>
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<tr>
<td>Modes</td>
<td>1.9-2.6</td>
<td>1.8-2.0</td>
<td>0.3</td>
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</tbody>
</table>

Technique of manufacture. See major type description.

Comments. The development of this type variant is analogous to that of Type Variant 6A. Of the two specimens recovered from Cayuse I deposits, one might justifiably be placed in Type Variant 6D. It is placed in this group in order to guard against too dogmatic a classification or interpretation. These two early specimens are probably fortuitous, accidents of form rather than part of a traditional pattern. Of the remaining 20 specimens, 5 are Cayuse II and 15 are Cayuse III.

Distribution.

<table>
<thead>
<tr>
<th>Component</th>
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</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>2; G, 1; H, 3; I, 10; L, 1; undesignated, 5</td>
</tr>
<tr>
<td>VI</td>
<td>0</td>
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</tbody>
</table>
Of the five undesignated specimens, one is probably Cayuse III and four are Cayuse II in age.

Comparable Specimens. See major type description.

Type Variant 6C. (Figs. 25, f-i; 32, a-e; 39, i-o)

Number of specimens. 78.

Material. Cryptocrystalline silica.

Measurements and description. On the average these specimens are some of the largest in Type 6. They are finely made and characterized by straight or slightly concave edges which are often finely serrated, pointed barbs which usually equal or exceed the stem length, and slightly expanding or, less frequently, parallel-sided stems. Forty-nine of the specimens were stem indented.

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</tr>
<tr>
<td>Modes</td>
<td>2.5-3.2</td>
<td>1.8-2.2</td>
<td>0.3</td>
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</table>

Technique of manufacture. See major type description.

Comments. Type Variant 6C is characteristic of the entire Cayuse Phase, though it is most common during the Cayuse I period.

Through retouch and use, one of the specimens in this group has been converted into a spokeshave-like scraper with a broad, crescent-like indention along one edge. The retouching is all unifacial, suggesting a scraping rather than cutting action.

Distribution.

<table>
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<tr>
<td>I</td>
<td>25</td>
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<tr>
<td>P</td>
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<tr>
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<tr>
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<tr>
<td>S</td>
<td>15</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Comparable specimens. See major type description.

Type Variant 6D. Eccentrics (Fig. 39, aa-ee)

Number of specimens. 6 [125]

Material. Cryptocrystalline silica. Specimens in this group are unique in that they have been deliberately manufactured with a single barb. To describe them in more detail is futile in as much as each has its own particular characteristics. Five of the six are illustrated in Figure 39 (aa-ee). The sixth specimen is much the same as ee. Note the lateral notches on specimens cc and dd.

Technique of manufacture. See major type description.

Comments. Lateral notches found on two specimens from VIIA suggest that they and the other eccentrics had a definite, and probably special function. Collectors have recovered a large number farther north from a large eddy in the Columbia River. Thus it is postulated that they were used in fishing, perhaps as toggling harpoon heads.

Distribution.

<table>
<thead>
<tr>
<th></th>
<th>VII:</th>
<th>VI:</th>
<th>V:</th>
<th>IV:</th>
<th>III:</th>
<th>II:</th>
<th>I:</th>
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<td></td>
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<td></td>
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<tr>
<td>C</td>
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<tr>
<td>D</td>
<td>6</td>
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<td>I</td>
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<td>0</td>
<td></td>
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</tr>
</tbody>
</table>

Comparable specimens. See major type description.

Type Variant 6E. (Figs. 25, j-k; 32, f-g; 39, s-w)

Number of specimens. 59.
Material. Cryptocrystalline silica.

Measurements and description. The specimens comprising this type variant possess straight or, less frequently, slightly concave edges. The barbs are always square in outline and may equal or nearly equal the length of the stem. The stems of seven specimens have been broken away. Of the remaining 51 specimens, 28 are stem indented.

<table>
<thead>
<tr>
<th>Length</th>
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<th>Thickness</th>
</tr>
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<tbody>
<tr>
<td>Extremes</td>
<td>2.0-4.3</td>
<td>1.4-2.8</td>
</tr>
<tr>
<td>Modes</td>
<td>1.7-2.2</td>
<td>2.4-3.6</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. This type variant which Crabtree (1957) has termed the Middle Columbia Basal-Notched Point, occurs throughout the Cayuse Phase, being particularly common in the Cayuse I period. One of its members is the oldest specimen ascribed to the Cayuse Phase. It occurred in the uppermost portion of Stratum IV well above the latest Quilomene Bar subcomponents. Thus it is somewhat misleading, in terms of site utilization patterns, to have placed it in the Cayuse period. However, it would have been even more misleading to say that it was Quilomene Bar in its affinities. It is caught in the transition between these phases.

Distribution.

| VII: A, 15; B, 1; D, 7; E, 1; F, 1; H, 2; I, 11; L, 1; undesignated, 12 |
| VI: 0 |
| V: 0 |
| IV: 0 |
| III: 0 |
| II: 0 |
| I: 0 |

Comparable specimens. See major type description.

Type Variant 6F. (Fig. 39, x-y)

Number of specimens. 14.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group are comparatively large, having slightly convex edges, pointed barbs, and slightly expanding or parallel-sided stems. The length of the barbs usually equals that of the stems, six of which are indented.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme</td>
<td>2.8-3.7</td>
<td>1.6-1.9</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. This type variant is characteristic of the entire Cayuse Phase.

Distribution.

| VII: A, 5; B, 1; C, 1; D, 1; E, 1; F, 1; G, 1, I, 3; undesignated, 1 |
| VI: 0 |
| V: 0 |
| IV: 0 |
| III: 0 |
| II: 0 |
| I: 0 |

Comparable specimens. See major type description.

Type Variant 6G. (Fig. 39, z)

Number of specimens. 5.

Material. Cryptocrystalline silica.

Measurements and description. Compared with other specimens in Type 6, these points are poorly made, having irregular edges, uneven, rounded barbs, and expanding stems, one of which is indented.

Only two of these specimens are complete, measuring 3.05 x 1.8 x 0.3 cm., and 2.7 x 1.5 x 0.4 cm. One of the fragmentary specimens is 1.9 cm. in width and estimated to have been between 3.2 and 3.4 cm in length.

Technique of manufacture. See major type description.
Comments. These specimens, which occur throughout the Cayuse Phase, may be the product of working with inferior materials rather than an expression of purpose. The fact that they all are made of grainy silicified materials supports this conclusion. [127]

Distribution.

<table>
<thead>
<tr>
<th>Type</th>
<th>VII:</th>
<th>VI:</th>
<th>V:</th>
<th>IV:</th>
<th>III:</th>
<th>II:</th>
<th>I:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, 1; D, 1; H, 1; I, 2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Comparable specimens. None.

Type 6. Columbia Plateau Corner-Notched. Miscellaneous Specimens and Fragments (Fig. 39, ff-ll)

Number of specimens. 148.

Material. Cryptocrystalline silica.

Measurements and description. About 60 of the specimens in this type variant are miscellaneous forms which do not readily fall into any of the other type variants. Seven of these are illustrated in Figure 39, and will give some idea of the range of forms which they represent. The remaining specimens in this group are fragmentary and cannot be placed with certainty in any of the other type variants. Needless to say, the measurements given below are based only on the 60 deviant specimens.

<table>
<thead>
<tr>
<th>Length</th>
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</thead>
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<tr>
<td>Extremes</td>
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<td>1.2-3.0</td>
</tr>
<tr>
<td>Modes</td>
<td>2.3-3.2</td>
<td>1.4-2.2</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. None.

Distribution.

<table>
<thead>
<tr>
<th>Type</th>
<th>VII:</th>
<th>VI:</th>
<th>V:</th>
<th>IV:</th>
<th>III:</th>
<th>II:</th>
<th>I:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, 28; B, 2; C, 5; D, 6; F, 5; G, 8; H, 17; I, 42; L, 4; undesignated, 31</td>
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</table>

Comparable specimens. See major type description.

Type 6. Columbia Plateau Corner-Notched. Points in the Process of Being Manufactured

Number of specimens. 15.

Material. Cryptocrystalline silica.

Measurements and description. All the specimens in this group possess but a single base or corner notch, and all save one are fragmentary, with broken tips, fractures originating at the head of the notch, or both. In other respects they appear much the same as other specimens in Type 6, with straight or convex edges. Only one specimen [128] has concave edges, and none are as small as those in Type Variant 6A. It is probable that they were broken and discarded during the process of manufacture.

Technique of manufacture. See major type description.

Comments. None.

Distribution.

<table>
<thead>
<tr>
<th>Type</th>
<th>VII:</th>
<th>VI:</th>
<th>V:</th>
<th>IV:</th>
<th>III:</th>
<th>II:</th>
<th>I:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, 4; B, 1; G, 1; H, 1; I, 2; L, 1; undesignated, 5</td>
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<td>0</td>
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<td>0</td>
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</tr>
</tbody>
</table>
Type 7. A Cluster of Stemmed Forms (Figs. 15, n; 40, hh, nn)

Number of specimens. 8.

Material. Cryptocrystalline silica.

Measurements and description. From illustrations of specimens in this group, it is evident that there is little consistency of form from one specimen to another. Some probably are knives, as they are quite large. Measurements and other data accompany the illustrations.

Technique of manufacture. The largest of these specimens is percussion flaked, while the others may be either or both pressure and percussion flaked.

Comments. The specimens to this group do not form a type in the true sense of that term. They are a diverse aggregate of stemmed forms which have been termed a type only in order that the historical sequence of stemmed and shouldered projectile points will be made quite clear. The Frenchman Springs Phase is characterized by Rabbit Island Stemmed points (Type 3), while the Cayuse III Subphase is characterized by a morphologically more diverse group of stemmed and shouldered points (Type 8). In the intervening period of about 2,500 years, stemmed and shouldered points appear to be very rare, though never entirely absent “Type” 7 points are the exceptions to this general rule, isolated and unique projectile points which are not related to either of the stemmed and shouldered point traditions represented at the site (see Figs. 15, n; 37, e-k; 40, hh-nn; 41, a-z). The seven specimens in the “type” show no consistency among themselves, and only two, or 1.2 percent of the stemmed points from the Cayuse I and II Subphases, might be considered possible representatives of a stemmed and shouldered tradition linking the early and late occurrences of such points at 45KT28.

Although specimens in this group have been given type status to demonstrate that Rabbit Island Stemmed points (Type 3) and the Upper Columbia Stemmed Complex (Type 8) are two quite different phenomena, historically unrelated in the Vantage locale, evidence at hand does not permit their confirmation as a type.

Distribution.

<table>
<thead>
<tr>
<th>VII</th>
<th>A, 4; B, 1; D, 1; F, 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>VI</td>
<td>1</td>
</tr>
<tr>
<td>V</td>
<td>0</td>
</tr>
<tr>
<td>IV</td>
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<tr>
<td>III</td>
<td>0</td>
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<tr>
<td>II</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>0 [129]</td>
</tr>
</tbody>
</table>

Comparable specimens. None.

The specimen from Cultural Component VI derives from the most recent Quilomene Bar subcomponent at the House Pit 15 excavations.

Type 8. Upper Columbia Stemmed Complex (Figs. 32, x, jj; 41, a-z)

Number of specimens. 61.

Material. Six are basalt; 55 of cryptocrystalline silica.

Measurements and description. The specimens comprising this type vary considerably in size and specific form, though all are stemmed and shouldered. In general they possess straight or slightly convex edges; rounded, square, or tanged shoulders; and contracting or parallel-sided stems whose bases are pointed, square, or convex. The cross section is usually lenticular. Measurements and more detailed descriptions may be found by consulting the various type variants.

Technique of manufacture. It is difficult to say whether pressure flaking, percussion flaking, or a combination of both techniques was utilized in manufacturing these specimens. The triangular blank technique of preparation may have been used on a few specimens, but direct manufacture from the raw flake was by far the preferred process.

Comments. The Upper Columbia Stemmed Complex is a hodge-podge of simple stemmed and shouldered points characteristic of the Cayuse III Subphase. They are commonly associated, along the Upper Columbia, with small side-notched points (Type 10) and Wallula Rectangular-Stemmed points (Type Variant 8A). Similar associations have been reported from many sites in the Upper Columbia region and adjacent territories (Crabtree 1957; Massey and Nelson 1958; Osborne 1956-57, 1959: 45GR78 and 45GR91; Daugherty 1952: 45GR30; Mills and Osborne 1952: 45GR2; Miller 1959; and Collier, Hudson and Ford 1942: sites 2, 11, 22, 45, and 46).

Much less information is available for the southern Plateau, the best and most clearly reported recent sequence being from Wakemap Mound (Caldwell 1956; Butler 1958a). Here we find that stemmed and shouldered forms were common during the entire occupation of the site which C¹⁴ dates indicate began about 900 AD. (Garner 1959; Crane and Griffin 1958a; 1958b). As the Cayuse III Subphase began between 1600 and 1700 AD., it is likely that the Upper Columbia Stemmed Complex is, at least in large part, a product of diffusion from the lower reaches of the Middle Columbia Region.
Distribution.

VH: H, 16; I, 37; L, 2; undesignated, 6
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

The six undesignated specimens derive from deposits most probably assignable to the Cayuse III Subphase.

Comparable specimens. See various type variants.

Type Variant 8A (Fig. 41, a)

Number of specimens. 3.

Material. Cryptocrystalline silica.

Measurements and description. In comparison with others in this type, these specimens are crudely made, possessing convex edges, well-defined shoulders, and slightly contracting stems whose bases are convex. All are fragmentary, measuring, respectively, 1.8, 1.8, and 1.6 cm. in width. The longest specimen would not have exceeded 3.5 cm. in length.

Technique of manufacture. See major type description.

Comments. None.

Distribution.

VII: H, 1; I, 1; undesignated, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Comparable specimens. None.

The undesignated specimen postdates Subcomponent VIIIE and therefore roost probably represents the late Cayuse II or Cayuse III Subphase.

Type Variant 8B (Fig. 41, b-d)

Number of specimens. 5.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group possess straight edges, laterally tanged shoulders, and contracting stems whose bases are rounded. Two of the specimens are serrated.

<table>
<thead>
<tr>
<th>Length</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>2.1-3.1</td>
<td>1.3-2.1</td>
</tr>
<tr>
<td>Modes none</td>
<td>1.3-1.7</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. Morphologically these specimens duplicated many Rabbit Island Stemmed points (Type 3). However, associated materials and temporal distribution along the Upper Columbia appear to be quite different, approximately 2,500 years having elapsed between the end of the Frenchman Springs Phase and the beginning of the Cayuse III Subphase, the units with which they are respectively associated.

A more detailed discussion may be found in the comments on "Type" 7 and Type 3.

Distribution.

VII: I, 4, undesignated, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
The undesignated specimen postdates Subcomponent VIIG, having derived from the top 12 inches of midden capping the house fill above that subcomponent. Thus it is almost certainly associated with the Cayuse III Subphase.

**Comparable Specimens.**
Caldwell 1956: Pl. VII. cc
Massey and Nelson 1958: 55, 437 and 438; 57, 456
Osborne 1959: Pl. V, p

**Type Variant 8C** (Fig. 41, e)

**Number of specimens.** 2.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens possess straight edges, well-defined shoulders, and slightly contracting stems with square bases. They measure 2.4 x 1.3 x 0.7 cm., and 2.5 x 1.5 x 0.5 cm.

**Technique of manufacture.** See major type description.

**Comments.** None.

**Distribution.**

<table>
<thead>
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<td>III:</td>
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<tr>
<td>II:</td>
<td>0</td>
</tr>
<tr>
<td>I:</td>
<td>0</td>
</tr>
</tbody>
</table>

**Note:** Second listing of 8C under the title of 8D has been remove from this digital copy. [132]

**Type Variant 8D.** (Figs. 32, cc-dd; 41, f-h)

**Number of specimens.** 7.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens possess straight to slightly convex edges, rounded or square shoulders, and parallel-sided stems whose bases are convex. The cross section is lenticular.

<table>
<thead>
<tr>
<th>Extremes</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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</thead>
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<td></td>
<td>2.7-3.4</td>
<td>1.1-1.3</td>
<td>0.3-0.5</td>
</tr>
</tbody>
</table>

**Technique of manufacture.** See major type description.

**Comments.** None.

**Distribution.**

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII:</td>
<td>H, 2; I, 3; undesignated, 2</td>
</tr>
<tr>
<td>VI:</td>
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<td>V:</td>
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<td>IV:</td>
<td>0</td>
</tr>
<tr>
<td>III:</td>
<td>0</td>
</tr>
<tr>
<td>II:</td>
<td>0</td>
</tr>
<tr>
<td>I:</td>
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</tbody>
</table>

The two undesignated specimens may be assigned either to the top of the fill to Subcomponent VIIC or the floor level of Subcomponent VIIH. As two (other specimens in the type variant) derive from Subcomponent VIIH and the top of the fill in Subcomponent VIIC is normally quite barren of artifacts, it seems certain that the undesignated specimens derive from VIIH and are therefore tentatively assigned to the Cayuse III Subphase.

**Comparable specimens.**
Caldwell 1956: Pl 7, 1
Massey and Nelson 1958: 57, 604
Mills and Osborne 1952: Fig. 107, u
Osborn 1959: Pl. VI. aa

**Type Variant 8E.** (Figs. 32, ff-jj; 41, i-m)
Number of specimens. 14.

Material. Three are of basalt and 11 of cryptocrystalline silica.

Measurements and description. The specimens in this group are long and narrow with convex edges, tanged or rounded shoulders, and parallel-sided or slightly expanding stems with convex bases. One specimen has been notched just above the shoulders (Fig. 41, k).

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
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<tbody>
<tr>
<td>Extremes</td>
<td>1.8-4.1</td>
<td>0.5-1.2</td>
<td>0.25-0.5</td>
</tr>
<tr>
<td>Modes</td>
<td>2.4-2.9</td>
<td>0.7-1.0</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. None. [133]

Distribution.

VII: H, 5; I, 7; L, 1; undesignated, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Comparable specimens.
Massey and Nelson 1958:55, 353
Crabtree 1957: Pl. XVII. 1

Type Variant 8F. (Fig. 41, n-p)

Number of specimens. 8.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group have straight edges, tanged shoulders, and parallel-sided stems whose bases are square. The stem of one specimen is slightly expanding.

<table>
<thead>
<tr>
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<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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</thead>
<tbody>
<tr>
<td>Extremes</td>
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<td>1.0-1.6</td>
<td>0.3-0.4</td>
</tr>
<tr>
<td>Modes</td>
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<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. None.

Distribution.

VII: H, 4; I, 4
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Comparable specimens. None.

Type Variant 8G. (Fig. 41, q-r)

Number of specimens. 5.

Measurements and description. The specimens in this group are quite small, possessing straight edges, square shoulders, and parallel-sided or very slightly expanding stems whose bases are straight.

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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</thead>
<tbody>
<tr>
<td>Extremes</td>
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<td>0.8-1.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Modes</td>
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<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. None. [134]
Distribution.

VII: H, 3; I, 1; undesignated, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

The undesignated specimen derives from an area disputed between the top of the fill in Subcomponent VIIC and the floor level of Subcomponent VIIH. As three other specimens derive from Subcomponent VIIH, and the fill in Subcomponent VIIC is barren of artifacts elsewhere, it seems almost certain that the undesignated specimen derives from VIIH and is therefore tentatively assigned to the Cayuse III Subphase.

Comparable specimens.

Swanson 1962a: Fig. 34, e

Type 8. Upper Columbia Stemmed Complex. Miscellaneous Specimens (Fig. 41, s-z)

Number of specimens. 15.

Material. Three are of basalt and 12 of cryptocrystalline silica.

Measurements and description. Although the specimens in this group do not duplicate any of the particular type variants in Type 8, they may nevertheless be considered a part of that type. The eight specimens illustrated in Figure 41 cover the general range of forms represented. More data accompany the illustrations.

Technique of manufacture. See major type description.

Comments. None.

Distribution. Comparable specimens. None.

VII: H, 1; I, 13; L, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Type 9. Barbed Points with Open Corner Notches (Figs. 32, s-w; 40, a-gg)

Number of specimens. 62.

Material. One is of obsidian and 61 are cryptocrystalline silica.

Measurements and description. The forms subsumed under this type designation are many and varied. They range from small points with almost no barbs at all to large specimens very similar to those in Type Variant 6C. The edges may be straight or convex; the cross section is lenticular. The notches are placed high on the corners and tend to produce short barbs which never equal the length of the stem.

<table>
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<td>Modes</td>
<td>2.0-3.1</td>
<td>0.9-1.7</td>
<td>0.3-0.4 [135]</td>
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</table>

Technique of manufacture. These specimens were manufactured either by pressure flaking or a combination of pressure and percussion flaking. Triangular blanks were prepared first and then notched with the possible exception of some of the smaller specimens in Type Variant 9A. Stem indentations were added only in five instances. The workmanship was generally very fine.

Comments. The introduction of this type corresponds with the introduction of late stemmed points (Type 8) as well as small side-notched points (Type 10) at the site and presumably the entire Vantage locale. Type Variant 9A (Wallula Rectangular-Stemmed) is abundantly represented elsewhere in the Plateau, especially along the Middle Columbia. Although little is known of this type variant's antiquity elsewhere in the Plateau, Caldwell's typology for Wakemap Mound suggests that it did not occur in The Dalles area until about 1200 A.D. (Caldwell 1956; Garner 1959). At 45KT28 it is one of the characteristic point types of the Cayuse III Subphase and is introduced ca. 1600 or 1700 A.D., suggesting northward diffusion along the Columbia River in late prehistoric times.

Other type variants in this type are not represented by comparable traditions elsewhere in the Plateau and may indicate a morphological response in the manufacture of Type 6 points to the introduction of points of Type Variant 9A.
and Type 8.

**Distribution.**

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<tr>
<td>I:</td>
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</tbody>
</table>

**Comparable specimens.** See the various type variants.

Of the five undesignated specimens, four are Cayuse III in age and one derives from either Cayuse I or II.

**Type Variant 9A. Wallula Rectangular-Stemmed** (Figs. 32, s-w; 40, a-t)

**Number of specimens.** 44.

**Material.** Cryptocrystalline silica.

**Measurements and description.** The specimens included in this class are exceedingly variable, and general description is difficult. The largest specimens commonly have straight edges, pointed barbs, and a slightly expanding stem whose base is straight, or as is more often the case, slightly convex. Because these points are longer they also tend to be wider. Consequently the notches are deeper, the barbs larger and more pronounced, but the stem of about the same size as those of many smaller specimens. The smallest specimens, on the other hand, tend to have convex edges, very small pointed barbs, and stems which are more frequently parallel-skied than expanding. A gradation exists between these extremes.

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<td>1.0-1.6</td>
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</table>

**Technique of manufacture.** See major type description.

**Comments.** The designation Wallula Rectangular-Stemmed has been adopted from the typology of Osborne, Bryan, and Crabtree (1961), who specify the following characteristics: straight or convex edges, corner notches, and a parallel sided or slightly expanding stem. Nothing is specified about the nature of shoulders or barbs, but illustrated specimens reveal both short, pointed barbs and square, sharp shoulders. Caldwell (1956: Type 2), in [136] applying this type designation to the projectile point assemblage from Wakemap Mound, illustrates only stemmed and shouldered varieties and relegates all slightly barbed variants of the type to new type designations. More recently, Pavesic, et al. (1964:11; Plate 1) have cited strongly barbed projectile points with concave edges as Wallula Rectangular-Stemmed points, while excluding some "stemmed lanceolate" projectile points (1964:16, Plate 1, m) which are very similar to the type specimens illustrated by Osborne, et al. (1961: Plate 56, top row).

In this report, Wallula Rectangular-Stemmed points are defined by short, pointed barbs in association with straight or convex edges. The stemmed and shouldered points cited by Osborne, et al. (1961) and Caldwell (1956) are included in Type 8 because of their apparent relationships with other stemmed and shouldered forms. The barbed specimens which Pavesic, et al. (1964) have called Wallula Rectangular-Stemmed points, are included in Type Variant 6A and considered as a variant of the Columbia Plateau Corner-Notched point type.

**Distribution.**

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<td>I:</td>
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Of the five undesignated specimens, four are Cayuse III in age and one is either Cayuse I or II in age.

**Comparable specimens.**

- Caldwell 1956: Pl. VII, e
- Collier et al., 1942: Pl. III, h
- Crabtree 1957: Pl. XVII, e-f
- Osborne 1957: Pl. 22, 24-25
- Osborne, Bryan, and Crabtree 1961: Pl. 56, top row
- Osborne, Crabtree, and Bryan 1952: Fig. 110, v
Type Variant 9B (Fig. 40, u-w)

*Number of specimens.* 5.

*Material.* Cryptocrystalline silica.

*Measurements and description.* The specimens comprising this type variant are very similar to those in Type Variant 6C. The notches, however, are set higher on the corners, so that these specimens possess concave edges, pointed barbs which do not equal the length of the stem, and a slightly expanding stem whose base is convex. The cross section is lenticular. One specimen is finely serrated.

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*Technique of manufacture.* See major type description.

*Comments.* None. [137]

*Distribution.*

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Type Variant 9C (Fig. 40, x-y)

*Number of specimens.* 2.

*Material.* Cryptocrystalline silica.

*Measurements and description.* Though longer, narrower, and cruder, these specimens are very much like those in Type Variant 7B. They possess straight to concave edges, short rounded barbs, and an expanding stem whose base is convex. They are somewhat irregular in outline. The cross section is lenticular. One measures 3.2 x 1.4 x 0.4 cm.; the other 3.6 x 1.5 x 0.3 cm.

*Technique of manufacture.* See major type description.

*Comments.* None.

*Distribution.*

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Type Variant 9D (Fig. 40, z-bb)

*Number of specimens.* 5.

*Material.* One is obsidian; the others are of cryptocrystalline silica.

*Measurements and description.* These specimens have slightly convex edges, short pointed barbs, and slightly expanding stems whose bases are indented. The workmanship is fine; the cross section is lenticular.

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*Technique of manufacture.* See major type description.

*Comments.* None. [138]

*Distribution.*

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</table>
Type Variant 9E. (Fig. 40, cc-ee)

Number of specimens. 4.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group are very similar to those in Type Variant 6A, whose long barbs they lack. They possess convex edges, short pointed barbs, and an expanding stem whose base in convex.

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Technique of manufacture. See major type description.

Comments. None.

Distribution. Comparable specimens. None.

Type 10. Columbia Plateau Side-Notched Point (Figs. 32, kk-oo; 41, aa-nn)

Number of specimens. 35.

Material. Two are of obsidian and 33 of cryptocrystalline silica.

Measurements and description. These specimens possess straight or slightly convex edges, small narrow side notches, and bases which are usually straight or concave, but occasionally slightly convex. Only one specimen has a base indentation (Fig. 41, ii).

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<td>0.2-0.5</td>
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<tr>
<td>Modes</td>
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<td>1.1-1.5</td>
<td>0.3</td>
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</table>

Technique of manufacture. A triangular blank was first prepared by means of pressure flaking. It was then
Comments. The distribution of this type throughout the Plateau is exceedingly important to the historical reconstruction of late prehistoric times and in terms of its fit with ethnographic information. In Kootenai County, Idaho, at a total of 30 sites reported by Miller (1959), Columbia Plateau Side-Notched points comprised about 27 percent of the total number of stemmed and unstemmed points and 31 percent of all stemmed points recovered. Although many objects of historic trade were recovered, the sites from which they came were not specifically recorded, so it is difficult to estimate the age of these points in the area. However, Miller does mention that none of the sites possess much depth and that 10 (one-third of the total number) were reported ethnographically. Thus it is likely that side-notched points of this type are not old in the area, a fact which would agree with present knowledge of other portions of the Plateau, where they are known to be late prehistoric and historic in age.

Moving westward into Washington, we find that Type 10 comprises about 51 percent (38 out of 75 specimens) of the stemmed projectile points at Fort Spokane, a predominately historic site (Combes 1964:20-22). Along the Upper Columbia between Grand Coulee Dam and the Canadian border, it comprised about 9 percent of the stemmed points from 22 reported sites (Collier, et al., 1942). Of these 22 sites, 10 may contain assemblages which antedate the introduction of Columbia Plateau Side-Notched points; thus 9 percent is a minimal distribution frequency for this portion of the Upper Columbia.

Coming southward we find only two large samples of projectile points. At 45GR30, on the shore of Moses Lake, out of 151 points in one house pit, 14 percent were side notched (Daugherty 1952). At 45KT28 small side-notched points account for about 7 percent of all stemmed points during the Cayuse III Subphase. Other sites in the Sun Lakes-Chief Joseph locale with numbers of projectile points less than 20 have produced from 6 to 60 percent small side-notched points. Sites such as these include 45GR91 (Osborne 1959), 45GR94 (Osborne 1959; Gallagher 1959), 45GR2 (Mills and Osborne 1952), and 45KT13 (Osborne 1956-57).

In the southern Plateau this type is much more difficult to quantify as it does not occur in large assemblages. One of the largest collections is from 35WS3 located in the lower Dalles Reservoir (Shiner 1953). Out of 441 stemmed and nonstemmed triangular points, one group, consisting of all unmodified triangular points, accounted for nearly 5 percent of the points. Out of these 21 points, three are illustrated and two of these are side notched. Consequently 1 and 4 percent might serve as the best possible limiting figures. At other large sites in the Dalles locale such as Five-Mile Rapids and Wakemap Mound the small side-notched point seems to be nonexistent or practically so (Cressman 1960; Caldwell 1956).

It is more difficult to appraise the significance of late prehistoric projectile point assemblages along the Snake River because they are few in number, small in size, and frequently associated with burial sites. Excavations in the upper McNary Reservoir (Osborne 1957; Shiner 1961), and at Fish Hook Island (Lelander 1958; Combes 1964: personal communication), Windust Cave (Rice 1965), Three Springs Bar (Daugherty 1964: personal communication), and the mouth of the Tucannon River (C. M. Nelson 1965), indicate that small side-notched points were common along the lower Snake River in late prehistoric times. Moreover, a recent survey of the Asotin Reservoir (C. M. Nelson and D. G. Rice 1965: personal communication) demonstrates that Columbia Plateau Side-Notched points were abundant in late prehistoric and early historic times along the Snake River between the mouths of the Clear-water and Grande Ronde rivers. Recent work in Hells Canyon (Pavesic, et al., 1964) has also revealed small numbers of this projectile point type at a late prehistoric site near Homestead, Oregon.

From data now at hand it would seem that Columbia Plateau Side-Notched points are most abundant in the eastern and northern portions of the Columbia Plateau, and become increasingly less abundant westward and southward along the Snake and Columbia rivers. This fact itself suggests that the type originated in the eastern or northeastern Plateau or in the adjacent area of the High Plains where similar projectile points were abundant in the late prehistoric period. The hypothesis that Columbia Plateau Side-Notched points were introduced from the Plains is supported by their abundance in Nez Perce territory (Swanson, et al., 1959; Pavesic, et al., 1964; C. M. Nelson and D. G. Rice 1965: personal communication) and by their presence in Flathead territory (White 1952; 1959; Malouf 1956; Griswold 1953; 1954; Griswold and Larom 1954), for these are the two groups which would most likely be intermediaries between the Plains and the Plateau. This hypothesis also fits well with ethnographic facts. Teit (1930:108-15, 248-54, 349-59), for example, expresses the belief that tribes along the eastern periphery of the Columbia Plateau, such as the Cour d’Alene, Flathead, and Nez Perce, were in frequent contact with the Plains after the introduction of the horse, while tribes in the western and central Plateau were engaged in a great deal of local interchange but had little direct contact with the Plains.

Distribution. Comparable specimens. None.

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<td>I: 0</td>
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Comparable specimens.

- Borden 1956: Plate V, 8-16
- Bryan 1955: Plate I, d
- Clinehens 1960: 55, c-e; 70, bb
- Crabtree 1957: Plate XVII, g,i
- Daugherty 1952: Fig. 114, 12
- Daugherty 1956b: Plate II, c-d
- Gruhn 1961b: Plate 37, d-e
- Gunkel 1961: Fig. 25, o-r
- Leland 1958: Fig. 5, 85-96; Fig. 24, 151-182; Fig. 30, 203; Fig. 32, 219-224; Fig. 57, 500
- Mallory 1962: Plate IV, i
- Malouf 1956: Plate II, top row b
- Massey and Nelson 1958: 54, 79-80
- Mills and Osborne 1952: Fig. 107, m-n, t-y
- Osborne 1956-57: A-13, 24 [141]
- Osborne 1957: Plate 22, 23
- Osborne 1959: Plate II, c-d; Plate VI, hh; Plate VH, h-i
- Osborne and Crabtree 1961: Fig. 7, 10, 18; Fig. 9, 245
- Osborne, Crabtree, and Bryan 1952: Fig. 110, h-i
- Osborne and Shiner 1951: Plate la, 63-64
- Shiner 1952: Fig. 105,47
- Smith 1910: Plate II, b-d
- Sprague 1960: Fig. 18
- Strong et al., 1930: Plate 12,1
- Swanson 1962a: Fig. 20, j
- Warren 1959: Plate 5. n"-p"
- Weld and Weld 1962: Fig. 10

**Type Variant 10A** (Fig. 41, jj-kk)

- **Number of specimens.** 4.
- **Material.** Cryptocrystalline silica.

  **Measurements and description.** The specimens in this group possess straight edges and pronouncedly concave bases. The notches are set a third of the way between the base and the point tip, and are thus considerably farther from the base than those of the specimens comprising Type Variant 10C. Only three of the specimens are complete, measuring 2.3 x 1.2 x 0.5 cm., 2.9 x 1.2 x 0.3 cm., and 3.0 x 1.6 x 0.5 cm.

  **Technique of manufacture.** See major type description.

  **Comments.** The specimens in this type variant, as well as those in Type Variant 10B, occur at the site earlier than the more numerous Type Variant 10C. Therefore, they may represent a developmental period shortly after the first introduction of the type into the Vantage locale.

  **Distribution.**  
  - Comparable specimens. None.
  - VII: H, 3; I,1
  - VI: 0
  - V: 0
  - IV: 0
  - III: 0
  - II: 0
  - I: 0

**Type Variant 10B** (Fig. 41, ll-mm)

- **Number of specimens.** 2.
- **Material.** Cryptocrystalline silica.

  **Measurements and description.** The specimens in this type variant possess convex edges and straight bases. The notches are set from one-half to one-third of the way from the base to the point tip. These specimens measure 2.5 x 1.5 x 0.5 cm. and 1.7 x 1.3 x 0.4 cm.

  **Technique of manufacture.** See major type description.

  **Comments.** See comments. Type Variant 10A. [142]
**Distribution.**

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Comparable specimens. None.

The undesignated specimen was recovered in slough deriving from VIIH. It is thus Cayuse III in age.

**Type Variant 10C.** (Figs. 32, kk-oo; 41, aa-ii)

**Number of specimens.** 27.

**Material.** Two are of obsidian and 25 of cryptocrystalline silica.

**Measurements and description.** These specimens possess straight to slightly convex edges. Sixteen have concave bases, four convex ones, and seven straight bases. One possesses a small basal indentation. The notches to all these specimens are close to the base.

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**Technique of manufacture.** See major type description.

**Comments.** See comments, Type Variant 10A.

**Distribution.**

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</tbody>
</table>

The undesignated specimen derives from 6-12" below the surface of the midden in House Pit 7. It is probably Cayuse III in age.

Comparable specimens. See major type description.

**Type Variant 10D** (Fig. 41; nn)

**Number of specimens.** 2.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens possess straight edges and very poorly defined side notches situated close to the base. The base of one is slightly convex; that of the other slightly concave. These specimens measure 2.3 x 1.4 x 0.4 cm., and 2.0 x 1.4 x 0.4 cm. [143]

**Technique of manufacture.** See major type description.

**Comments.** None.

**Distribution.**

<table>
<thead>
<tr>
<th></th>
<th>VII:</th>
<th>I, 2</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>I:</td>
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</tr>
</tbody>
</table>

**Comparable specimens.** None.

**Type 11. Modified Columbia Plateau Corner-Notched II** (Fig. 41, oo-rr)

**Number of specimens.** 12.
Material. One is basalt and the remainder are cryptocrystalline silica.

Measurements and description. The points in this type possess straight or slightly convex edges, well-defined shoulders which approach being barbs, and noticeably expanding stems. Stem bases may be concave, straight, or convex. Measurements and more detailed descriptions are given under the various type variants.

Technique of manufacture. A triangular blank was prepared by means of either pressure or percussion flaking or a combination of both. Then the corner was removed or notched in such a way as to produce specimens midway between being true side-notched and true corner notched-points.

Comments. The points in this type are morphologically similar to both side-notched and corner-notched specimens. Because their distribution correlates with the introduction of Type 10 (Columbia Plateau Side-Notched), they are thought to represent a morphological shift in the manufacture of some corner-notched points in which the notches are moved higher on the corners and even up onto the sides of the triangular blank which forms the basic unit upon which all late points are manufactured.

Distribution.

<table>
<thead>
<tr>
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<tbody>
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<td>III</td>
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<td>II</td>
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<tr>
<td>I</td>
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</tbody>
</table>

The undesignated specimen occurred in the fill above Subcomponent VIIG, and is thus Cayuse II or III in age.

Comparable specimens. See various type variants.

Type Variant 11A (Fig. 41, oo-pp)

Number of specimens. 10.

Material. Cryptocrystalline silica. [144]

Measurements and description. These specimens possess slightly convex edges, well-defined shoulders which sometimes approach being barbs, and an expanding stem whose base is concave or convex.

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Extremes</th>
<th>Modes</th>
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</thead>
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<tr>
<td>Width</td>
<td>1.0-1.3</td>
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</tr>
<tr>
<td>Thickness</td>
<td>0.3-0.5</td>
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</tr>
</tbody>
</table>

Technique of manufacture. See major type description.

Comments. None.

Distribution.

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>H</th>
<th>I</th>
<th>Und.</th>
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</thead>
<tbody>
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<td>1</td>
</tr>
<tr>
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<tr>
<td>V</td>
<td>0</td>
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<td>IV</td>
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<td>I</td>
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</tbody>
</table>

The undesignated specimen occurred in deposits which postdate Subcomponent VIIG and is thus Cayuse II or III in age.

Comparable specimens.

Massey and Nelson 1958: 59, 156
Osborne and Crabtree 1961: Fig. 9, 386, 225, 325
Shiner 1953: Fig. 2, row 3, a, g
Swanson 1958: Fig. 6 k
Osborne, Bryan, and Crabtree 1961; Plate 52, 11; Plate 54, 2

The specimens cited above do not duplicate those recovered from 45KT28 but will give some idea of the range of morphological forms which might be included in this type.

Type Variant 11B (Fig. 41, qq-rr)

Number of specimens. 2.
Material. Cryptocrystalline silica.

Measurements and description. These specimens possess convex edges, well-pronounced shoulders, and an expanding stem that is convex. They are small, short points measuring 2.2 x 1.0 x 0.2 cm., and 2.3 x 1.1 x 0.3 cm.

Technique of manufacture. See major type description.

Comments. None.

Distribution. Comparable specimens. None.

Form 1 (Fig. 42, a)

Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight edges, short barbs, and a contracting stem whose base is flat. Both are fragmentary, measuring *3.0 x 1.9 x 0.3 cm., and *1.6 x 1.7 x 0.4 cm.

Technique of manufacture. These specimens were manufactured from triangular blanks by means of either pressure or percussion flaking.

Comments. None.

Distribution. Comparable specimens. None.

Form 2 (Fig. 42, b-c)

Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight edges, laterally tanged shoulders, and slightly expanding stems whose convex bases are indented. They measure 2.6 x 0.9 x 0.3 cm., and 2.7 x 1.0 x 0.3 cm.

Technique of manufacture. These specimens were pressure flaked from chips without the use of a triangular blank.

Comments. None.

Distribution. Comparable specimens. None.

Form 3 (Fig. 42, d)

Number of specimens. 1.

Material, Cryptocrystalline silica. [146]

Measurements and description. This specimen possesses concave edges, small pointed barbs, and a slightly expanding stem whose base is straight. The cross section is lenticular. This point measures *2.3 x 0.9 x 0.3 cm.
Technique of manufacture. This specimen was manufactured by means of pressure flaking.

Comments. None.

Distribution.  Comparable specimens. None.

VII:  undesignated, 1
VI:  0
V:  0
IV:  0
III:  0
II:  0
I:  0

Form 4 (Fig. 42, e-f)

Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group have somewhat irregular outlines suggestive of simple stemmed points (see Fig. 42, e-f). They measure *1.6 x 1.1 x 0.3 cm., and 2.0 x 0.95 x 0.2 cm.

Technique of manufacture. These specimens are pressure flaked.

Comment. None.

Distribution.  Comparable specimens. None.

VII:  F, 1; I, 1
VI:  0
V:  0
IV:  0
III:  0
II:  0
I:  0

Form 5 (Fig. 42, g)

Number of specimens. 1.

Material. Cryptocrystalline silica.

Measurements and description. This specimen has convex edges, square shoulders, and a parallel-sided stem whose base possesses an exceptionally deep indentation, forming what collectors often call a dog-eared point. This specimen measures 3.0 x 1.4 x 0.5 cm.

Technique of manufacture. This specimen was pressure flaked.

Comments. None.  [147]

Distribution.  Comparable specimens. None.

VII:  1, 1
VI:  0
V:  0
IV:  0
III:  0
II:  0
I:  0

Form 6 (Fig. 42, h)

Number of specimens. 1.

Material. Cryptocrystalline silica.

Measurements and description. This specimen has straight edges, short, pointed barbs, and a slightly expanding stem whose base is irregular. It measures 3.1 x 1.3 x 0.3 cm.

Technique of manufacture. This specimen is the product of pressure flaking.

Comments. None.

Distribution.  Comparable specimens. None.

VII:  A, 1
Form 7 (Fig. 42, i)

**Number of specimens.** 1.

**Material.** Cryptocrystalline silica.

**Measurements and description.** This specimen has straight edges, short pointed barbs, and an expanding stem whose base is straight. It measures 4.0 x 1.2 x 0.3 cm.

**Technique of manufacture.** This specimen was manufactured by notching a triangular blank which had been prepared by pressure flaking.

**Comments.** None.

**Distribution.** Comparable specimens. None.

This specimen antedates VIIG by an unknown amount [148]

Form 8 (Fig. 42, j)

**Number of specimens.** 1

**Material.** Basalt.

**Measurements and description.** This specimen has straight edges, and deep, broad side notches which intersect a trapezoidal base. The cross section is lenticular. This specimen is fragmentary, measuring 5.7 x 2.8 x 0.9 cm.

**Technique of manufacture.** The specimen is the product of percussion flaking.

**Comments.** None.

**Distribution.** Comparable specimens. None.

This specimen derives from a storage pit associated with VIIF.

Form 9 (Fig. 42, k)

**Number of specimens.** 1.

**Material.** Blue and white quartzite.

**Measurements and description.** This specimen has straight edges, deep side notches, and a convex base which intersects the notches directly. It measures 6.6 x 4.1 x 0.8 cm.

**Technique of manufacture.** With the exception of the notches, this specimen is percussion flaked.

**Comments.** The style and material of this specimen are unlike those of the Plateau and are more similar to artifacts from the Eastern Woodlands and the Mississippi River Valley. Perhaps it is an article of trade, as it was associated with other aboriginal articles of trade such as an abalone pendant from California.

**Distribution.** Comparable specimens. None.

This specimen derives from a storage pit associated with VIIF.
Form 10 (Fig. 8, m)

Number of specimens. 1.

Material. Cryptocrystalline silica. [149]

Measurements and description. This specimen is the fragment of a stemmed or lanceolate point. Although the base is not entirely there, it is likely that it possessed bilateral tanged shoulders and was about 4.0 cm. in length and 1.7 cm. in width.

Technique of manufacture. This specimen is finely pressure flaked.

Comments. This specimen was found in deposits beneath the lenses containing Cultural Component I. However, because all of the cultural materials in these lenses have been redeposited, it does not follow that it is older. Because there was no evidence of stemmed points in Cultural Component I, it seems likely that this point base belongs to a later period, perhaps very early Frenchman Springs. The other possibility to consider is that it may have been related to the Lind Coulee assemblages found farther east (Daugherty 1956a). However, the geological deposits in which it is housed are probably not that old.

Distribution. Comparable specimens. None.

Form 11 (Fig. 8, e)

Number of specimens. 1.

Material. Cryptocrystalline silica.

Measurements and description. This specimen, the fragmentary base of a projectile point, is shouldered on one side and possibly notched on the other edge. Because it is badly shattered the precise form is difficult to determine, though it is likely it resembled a Pinto Basin point or was a stemmed lanceolate form of some kind. It measures 1.9 x 1.8 x 0.35 cm.

Technique of manufacture. This specimen appears to be percussion flaked.

Comments. None.

Distribution. Comparable specimens. None.

Leaf-shaped projectile points. This category, which contains 22 specimens, is important in the analysis of the Vantage and Frenchman Springs phase components. It contains all leaf-shaped forms which were probably projectile points, and excludes all those leaf-shaped forms which must have been used as knives. [150]

Distribution.

VII: A, 2; D, 1, I, 3
VI: 0
V: 1
IV: 2
III: 6
Type 1 (Fig. 43, a-j)

**Number of specimens.** 10.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens are large and variable in shape. One (Fig. 43, i), a slightly unsymmetrical basal fragment, is shouldered 2.2 and 3.3 cm. from its bluntly pointed base. These shoulders are very shallow, measuring about 1 mm., and may be the result of dulling the edges of the base prior to hafting. This specimen measures *4.3 x 2.8 x 0.8 cm.* Another very similar specimen (Fig. 43, h), which also derives from Cultural Component I, is shouldered 2.0 cm. from its pointed base. Along this specimen's other edge there is a shallow notch the same distance from the base, but it may be nothing more than an accident. This specimen measures *3.8 x 2.9 x 0.9 cm.* and, if complete, would have exceeded 6.5 cm. in length. The rest of the specimens have, to varying degrees, rounded bases and convex edges. Those marked a and b in Figure 43 are evidently a matched pair as they were found together and are of the same material. Specimen c in Figure 43 is almost semi-triangular and resembles a number of specimens recovered from Rabbit Island I (Crabtree 1957). Only two specimens in this group are complete. They measure 7.25 x 2.8 x 0.75 cm., and 6.5 x 2.5 x 0.85 cm. The latter is the smallest of the group and derives from Cultural Component V. The largest specimens would have come from Cultural Components I and II and would have measured up to 10 or 11 cm. in length and 3.7 to 4.0 cm. in width.

**Technique of manufacture.** These specimens are the product of percussion flaking.

**Comments.** Large leaf-shaped forms of this type were the predominant projectile point form in Cultural Components I and II and common in Cultural Component III. A single specimen derives from Cultural Component V. As a group these specimens resemble the early material from DJR, a site near Yale in the Fraser River Canyon of British Columbia (Boiden 1957; 1962). Here they derive from strata which date from 7500, 8100, and 9000 B.P. They are also similar to the Olcott material from the Puget Sound littoral (Butler 1961; Thomson 1961). At 4SKT28 this type appears to have been common during the Altithermal.

**Distribution.**

<table>
<thead>
<tr>
<th>Style</th>
<th>Comparable specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII:</td>
<td>0 Borden1957: 111, Fig. 3</td>
</tr>
<tr>
<td>VI:</td>
<td>0 Borden 1962: Pl. 1</td>
</tr>
<tr>
<td>V:</td>
<td>1 Butler 1961: Fig. 3B</td>
</tr>
<tr>
<td>IV:</td>
<td>0 Thompson 1961: Fig. 2</td>
</tr>
<tr>
<td>III:</td>
<td>3</td>
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<tr>
<td>II:</td>
<td>2</td>
</tr>
<tr>
<td>I:</td>
<td>4</td>
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</tbody>
</table>

**Style 1.** (Fig. 43, k-p)

**Number of specimens.** 6.

**Material.** Cryptocrystalline silica. [151]

**Measurements and description.** The specimens in this group are small and usually well made, but highly variable in outline. The cross section is lenticular with the exception of one specimen (Fig. 43, k) in which it is triangular. All of these specimens may be seen in Figure 43 (k-p). From k to o they measure, respectively, 6.2 x 1.9 x 1.1 cm., 5.5 x 1.7 x 0.75 cm., 5.0 x 2.3 x 0.7 cm., 4.1 x 2.3 x 0.9 cm., and 3.7 x 2.25 x 0.7 cm.

**Technique of manufacture.** These specimens appear to be the product of percussion flaking.

**Comments.** Some of the specimens in this group bear a superficial resemblance to the Cascade point as it is defined from the type collection from Indian Well I (Butler 1961). However, the specimens in this type are much more variable and not one of them duplicates a classic Cascade point. Thus there is no apparent connection between the two.

It is possible that these specimens represent a simple reduction in size of earlier Type 1 points, which they follow in early Medithermal times. Such a reduction in size might logically accompany a change in weapons systems, such as the atlatl replacing the hand-thrown spear.

**Distribution.**

<table>
<thead>
<tr>
<th>Style</th>
<th>Comparable specimens</th>
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<tbody>
<tr>
<td>VII:</td>
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<td>VI:</td>
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<tr>
<td>V:</td>
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<td>3</td>
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<td>II:</td>
<td>1</td>
</tr>
<tr>
<td>I:</td>
<td>0</td>
</tr>
</tbody>
</table>
Form I. (Fig. 42, 1-p)

Number of specimens. 6.

Material. Cryptocrystalline silica.

Measurements and description. This group of miscellaneous forms from Cultural Component VII is illustrated in Figure 42 (l-p), where they are accompanied by the proper vital information.

Technique of manufacture. All but one of the specimens, from Subcomponent VII-I, are pressure flaked. The latter is percussion flaked and may have served as a knife rather than a point.

Comments. These specimens all derive from Cultural Component VII, where they account for less than 1 percent of the projectile-point inventory. Therefore, they may be considered extraneous forms.

Distribution. Comparable specimens. None.

VII: A, 2; D, 1; I, 3
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Triangular projectile points. A total of 156 triangular points were recovered. A large percentage of these probably represent blanks prepared for the manufacture of base- and corner-notched points such as those in Types 6, 9, and 11. Others were undoubtedly used as points as the use of small basal indentations to two specimens indicates that they were hafted. Still others were probably utilized as knives. The specimen from Cultural Component III could not have been a point, but may have been used as a knife or scraper. One of the specimens from Cultural Component VI is fairly small and probably used as a point or knife. The other is large and may be a blank for a Type 5 point.

Distribution.

VII: A, 40; B, 6; C, 4; D, 4; E, 1; F, 2; G, 10; H, 10; I, 31; L, 2; undesignated, 43
VI: 2
V: 0
IV: 0
III: 1
II: 0
I: 0

Type 1 (Fig. 44, a-s)

Number of specimens. 150.

Material. Cryptocrystalline silica.

Measurements and description. The points in this type vary considerably in size, shape, and workmanship. Their edges vary from slightly concave, to straight, to slightly convex, the last two predominating. The corners of the base may be flared (Fig. 44, h), sharply pointed (Fig. 44, a), square (Fig. 44, m), or rounded (Fig. 44, i). The base itself is usually convex or straight with the exception of six specimens whose bases are concave. Two specimens, from VIIH and VII-I, possess small indentations in the center portion of the base. The cross section is usually lenticular, though a few specimens are plano-convex.

<table>
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<th>Width</th>
<th>Thickness</th>
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<tbody>
<tr>
<td>Extremes</td>
<td>1.6-5.3</td>
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<td>0.2-0.7</td>
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<tr>
<td>Modes</td>
<td>2.1-3.6</td>
<td>1.8-2.3</td>
<td>0.3-0.5</td>
</tr>
</tbody>
</table>

Technique of manufacture. These specimens appear to be pressure flaked.

Comments. Although the specimens in this type, like triangular points in general, are important as a collateral development in the manufacture of stemmed and barbed projectile points, they are of relatively minor importance in history in terms of specific types and type variants. Thus only two type variants seem to be of significance in Cultural Component VII, where 98 percent of this type occurs.

Distribution.

VII: A, 37; B, 6; C, 4; D, 4; F, 2; G, 10; H, 10; I, 31; L, 2; undesignated, 42
VI: 0
V: 0
IV: 0
III: 0
Comparable specimens. See the various type variants.

Type Variant 1A. (Figs. 25, n; 44, a-c)

Number of specimens. 9.

Material. Cryptocrystalline silica. [153]

Measurements and description. These specimens possess slightly concave to straight edges and straight to slightly convex bases whose comers are square or pointed. The cross section is lenticular.

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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<tbody>
<tr>
<td>Extremes</td>
<td>2.2-2.9</td>
<td>1.8-2.6</td>
<td>0.3-0.5</td>
</tr>
<tr>
<td>Modes</td>
<td>2.5-2.6</td>
<td>1.8-2.1</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. These specimens appear to be pressure flaked.

Comments. The distribution of this type variant at 45KT28 suggests that it is most common during the Cayuse I Subphase.

Distribution. Comparable specimens. Mills and Osborne 1952: Fig. 107, x

VII: A, 7; I, 1; undesignated, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

The undesignated specimen predates VIIG by an undetermined amount and is thus associated with the Cayuse I or II Subphases.

Type Variant 1B (Fig. 44, d-f)

Number of specimens. 6.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight or slightly convex edges, sharply pointed comers, and concave bases. Only two of the six specimens are complete, measuring 1.8 x 1.3 x 0.4 cm., and 2.8 x 1.8 x 0.3 cm. The other specimens appear to fall well within this measurement range.

Technique of manufacture. See major type description.

Comments. This type variant appears to be characteristic of the Cayuse III period just as do pentagonal knives with concave bases. This suggests that concavity of the base in nonstemmed points and knives is characteristic of the late prehistoric in the Vantage locale.

Distribution. Comparable specimens. Collier et al., 1940: Plate II, e-h

VII: H, 1; I, 4; undesignated, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

The undesignated specimen derives from me top 12 inches of fill above VIIG and is thus most probably Cayuse III in age. [154]

Type Variant 1C (Fig. 44, g-s)

Number of specimens. 135.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this type variant may be described in much the same terms used to describe the type as a whole. They possess straight or convex edges and straight or convex bases whose corners may be rounded, flared, pointed, or square.
<table>
<thead>
<tr>
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<th>Length</th>
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<tbody>
<tr>
<td>Extremes</td>
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<td>1.3-3.0</td>
<td>0.2-0.7</td>
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<tr>
<td>Modes</td>
<td>2.1-3.6</td>
<td>1.8-2.3</td>
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**Technique of manufacture.** See major type description.

**Comments.** See major type description.

**Distribution.**

<table>
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<tr>
<th></th>
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<th>B</th>
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</table>

**Comparable specimens.**

Caldwell 1956: Plate VIII, a, e
Collier et al., 1942: Plate II, p-s
Massey and Nelson 1958: 52, 280a; 53, 290
Nelson 1962b: Fig. 10, e
Shiner 1952: Fig. 105, 62, 64
Shiner 1953: Fig. 2, top row, d
Swanson 1962: Fig. 34, a-b

**Form 1** (Fig. 44, t)

**Number of specimens.** 1.

**Material.** Cryptocrystalline silica.

**Measurements and description.** This specimen has straight edges and a straight base with square corners. The cross section is lenticular. Abnormally large, it measures 6.8 x 2.6 x 0.7 cm.

**Technique of manufacture.** This specimen appears to be the product of pressure flaking.

**Comments.** None. [155]

**Distribution.**

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**Form 2.** (Fig. 44, u-v)

**Number of specimens.** 2.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens possess straight edges and convex bases. Near the base, one edge is drawn out into a large square tang which gives these specimens an L-shape. Each is fragmentary, measuring *2.8 x 2.5 x 0.55 cm.* and *2.1 x 2.1 x 0.5 cm.*

**Technique of manufacture.** These specimens appear to be pressure flaked.

**Comments.** None.

**Distribution.**

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</table>
Form 3. (Fig. 44, w)

Number of specimens. 2

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess slightly convex edges, and convex bases whose corners are square. They measure 4.0 x 2.9 x 0.6 cm., and 3.8 x 2.8 x 0.9 cm.

Technique of manufacture. These specimens appear to be percussion flaked.

Comments. None.

Distribution. Comparable specimens. None.

VII: A, 1; undesignated, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

The undesignated specimen postdates Subcomponent VIIG. [156]

Form 4. (Fig. 44, x)

Number of specimens. 1.

Material. Cryptocrystalline silica.

Measurements and description. This specimen has straight edges and a flat, flaring base with sharp, tang-like corners. The cross section is thick and irregular, one edge being very blunt and battered. This specimen measures *3.3 x 2.0 x 0.75 cm.

Technique of manufacture. This specimen is the product of percussion flaking.

Comments. This specimen was probably a knife or scraper rather than a projectile point.

Distribution. Comparable specimens. None

VII: 0
VI: 0
V: 0
IV: 0
III: 1
II: 0
I: 0

Semi-triangular projectile points and knives (Fig. 45). A total of 50 semi-triangular knives and points were recovered from 45KT28. Size, cross section, and the frequency of blunt tips suggest that the majority were used as knives, particularly those specimens in Type 1. However, many of the specimens in Type 2 and Forms 1 and 2 may have been utilized as points.

The term semi-triangular has been adopted to describe forms which lie morphologically between being triangular and lanceolate in outline.

Distribution. Comparable specimens. None

VII: A, 13; C, 1; D, 2; G, 1; H, 4; I, 20; L, 1; undesignated. 5
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Type I (Fig. 45, a-d)

Number of specimens. 22

Material Cryptocrystalline silica.

Measurements and description. These specimens possess convex edges, straight or convex bases, and square or rounded corners. The cross section is lenticular.
Technique of manufacture. These specimens are the products of percussion flaking. [157]

Comments. Though this type occurs throughout the Cayuse Phase, it is particularly common during the Cayuse III Subphase. The specimen from Cultural Component VI, it should be noted, is on the borderline between being of this type and Type 2, and may not represent an extension of Type 1 into the Quilomene Bar Phase (Fig. 15, h).

Distribution.

VII:  A, 3; H, 3; I, 13; undesignated, 2
VI:  1
V:  0
IV:  0
III:  0
II:  0
I:  0

One of the undesignated specimens is a member of the oldest assemblage from Cultural Component VII. Together with a stemmed point (Type Variant 6E) and a knife (Type 1), this specimen was found in the top three inches of Stratum III, overlying Quilomene Bar Phase subcomponents.

Comparable specimens.
Caldwell 1956: Plate VIII, b
Collier et al., 1942: Plate I, a-b
Gruhn 1961a: Fig. 2, a
Gunkel 1961: Fig.35, d
Massey and Nelson 1958: 50, 630

Type 2 (Figs. 11, h; 15, g; 45, e-h)

Number of specimens. 19

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight or convex edges and convex bases whose corners may be square or rounded. The outline is often irregular. The cross section is lenticular. Only two of these specimens are complete, measuring 4.1 x 1.5 x 0.3 cm., and 2.2 x 1.8 x 0.35 cm. The fragmentary specimens range in width from 2.0 to 2.3 cm. and would have mostly fallen between 3.8 and 4.5 cm in length.

Technique of manufacture. Both pressure and percussion flaking were evidently used in the manufacture of these specimens.

Comments. This type must rest upon its distribution within the deposits at 45KT28 rather than on comparative material. This may in part be due to the fact that similar specimens from other sites in the Plateau have been grouped under triangular points or knives and then simply not illustrated.

Distribution. Comparable specimens. None.

VII:  A, 9; C, 1; D, 2; G, 1; H, I, 1, 2; undesignated, 1
VI:  1
V:  0
IV:  0
III:  1
II:  0
I:  0 [158]

Style 1 (Fig. 45, m-n)

Number of specimens. 4

Material. Cryptocrystalline silica.

Measurements and description. These specimens are long and narrow, possessing slightly convex edges, straight bases, and rounded or square corners.

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</table>
Technique of manufacture. These specimens are the products of either or both pressure flaking and percussion flaking.

Comments. None.

Distribution. Comparable specimens. None.

VII: A, 1; I, 1; undesignated, 2
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Of the two undesignated specimens, one postdates Subcomponent VIIA and antedates VIIH, while the other antedates Subcomponent VIIH.

Form 1 (Fig. 45, i)

Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group possess straight edges and bases whose corners are square. The cross section is lenticular. Both are fragmentary, measuring *3.5 x 3.2 x 0.55 cm., and *2.6 x 3.4 x 0.9 cm.

Technique of manufacture. These specimens are probably the products of percussion flaking.

Comments. None.

Distribution. Comparable specimens. None.

VII: I, 2
VI: 0
V: 0
IV: 0
III: 0
II: 0 [159]

Form 2 (Fig. 45, j-k)

Number of specimens. 3.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess convex edges and straight bases whose corners are square. The cross section is shallow and lenticular. These specimens measure 3.0 x 1.7 x 0.3 cm., 3.95 x 1.8 x 1.0 cm., and 5.0 x 2.5 x 0.75 cm.

Technique of manufacture. The two specimens from Subcomponent VII-I may be either pressure or percussion flaking. The other is percussion flaked.

Comments. None.

Distribution. Comparable specimens. None.

VII: I, 2; L, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Lanceolate projectile points (Figs. 11, i-j; 45, l, o). Only six points which might be termed lanceolate were recovered from the site. Of these, only those from Cultural Component III have any real potential significance.

Distribution.

VII: A, 1; H, 1; I, 2
VI: 0
V: 0
IV: 0
Form 1 (Fig. 11, i-j)

Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess slightly convex edges and thick lenticular cross sections. One has a rounded base; the other a square base with rounded corners. Fragmentary, these specimens measure *2.5 x 1.5 x 0.9 cm., and *1.8 x 1.5 x 0.7 cm.

Technique of manufacture. These specimens are the product of percussion flaking.

Comments. None. [160]

Distribution. Comparable specimens. None.

Form 2. (Fig. 45, o)

Number of specimens. 1.

Material. Cryptocrystalline silica.

Measurements and description. This specimen possesses slightly convex edges and a straight base with rounded corners. The cross section is shallow and lenticular, and the body of the point is fairly broad. It measures *3.1 x 2.1 x 0.6 cm.

Technique of manufacture. This specimen is the product of percussion flaking.

Comments. None.

Distribution. Comparable specimens. None.

Form 3. (Fig. 45, l)

Number of specimens. 1.

Material. Cryptocrystalline silica.

Measurements and description. This specimen possesses straight edges and an irregular base with rounded corners. The cross section is thick and lenticular. This specimen measures *2.9 x 1.5 x 0.8 cm.

Technique of manufacture. This specimen appears to be the product of percussion flaking.

Comments. None. Comparable specimens. None.

Distribution.

VII: 1, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0 [161]
Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. Each of these specimens has convex edges expanding outward from a narrow, concave base the corners of which are square. The cross section is lenticular. Both fragmentary, these specimens measure *2.4 x *1.9 x 0.7 cm., and *1.3 x *2.1 x 0.5 cm.

Technique a/manufacture. These specimens appear to be pressure flaked.

Comments. None.

Distribution. Comparable specimens. None.

Type 1. Plateau Pentagonal (Figs, 33, e; 46, e-i)

Number of specimens. 9.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight or slightly convex edges and bases. The corners of the base may be square or slightly rounded. The cross section is lenticular. The basic outline is, of course, pentagonal. [161]

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<td>Modes</td>
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<td>2.5-2.7</td>
<td>0.6-0.8</td>
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Technique of manufacture. The specimens in this group appear to have been roughed out by means of percussion flaking and finished with pressure flaking.

Comments. The type designation Plateau Pentagonal has been adapted from Caldwell's (1956) Type 14. Caldwell's use of this designation encompasses both specimens of the characteristics of those in this group and other similar specimens with slightly concave bases. I have included all specimens possessing concave bases in Type 2, the Columbia Mule Ear Knife, a type in which Caldwell includes only those specimens with extremely concave bases.

Along the Columbia River, Plateau Pentagons are distributed, minimally, from the Canadian bonier to The Dalles. They are also common along the Lower Snake River. Along the Upper Columbia they are most common in Cayuse III times, but may also have occurred in much smaller quantities in the Cayuse I and II subphases. Of the nine specimens from 45KT28, seven are late Cayuse III, one is Cayuse I, and one cannot be accurately assigned a subphase designation. On the Middle Columbia, we have little to judge the antiquity of these specimens aside from Wakemap Mound (Caldwell 1956). Here they occurred from about 900 A.D. down to historic times.
This information, although meager, still suggests that the Plateau Pentagonal was introduced as a common element along the Upper Columbia during the Cayuse III period. Like many of the other types introduced at this time, its origin was probably The Dalles locale.

**Distribution.**

\[
\begin{array}{c|c|c|c|c|c}
 & VII & VI & V & IV & III \\
\hline
B, I, 6, L, & 1; & 0 & 0 & 0 & 0 \\
undesignated, 1 & 0 & 0 & 0 & 0 & 0 \\
\end{array}
\]

The undesignated specimen antedates Subcomponent VII J by an undetermined amount.

**Comparable specimens.**

- Caldwell 1956: Plate VIII, f-g, j-l
- Collier et al., 1942: Plate II, u
- Daugherty 1952: Fig. 114f, 7
- Lelander 1958: Fig. 5, 327
- Osborne 1957: Plate 22, 13-14
- Osborne, Crabtree, and Bryan 1952: Fig. 110, w

Type 2. *Columbia Mule Ear Knife* (Figs. 33, d; 46, a-d)

**Number of specimens.** 13.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens possess straight or slightly convex edges and concave bases. In cases of extreme basal concavity, the basic pentagonal outline gives the corners of the base an ear-like appearance. The cross section is thick and lenticular. [163]

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<td>Modes</td>
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</table>

**Technique of manufacture.** These specimens were roughed out with percussion and finished by means of pressure or percussion flaking. One specimen was found still in the roughed-out state.

**Comments.** This type has the same distribution as the Plateau Pentagonal, that is, along the Columbia River from The Dalles to the Canadian border and also along the Lower Snake. Along the Upper Columbia the knives are very late prehistoric and historic (Collier et al., 1942: site 46; Crabtree 1957: Pot Holes). On the Middle Columbia they are late prehistoric, occurring at least as early as 1200 A.D, at Wakemap Mound. This suggests that the Columbia Mule Ear Knife was introduced to the Upper Columbia from The Dalles area in late Cayuse III times.

**Distribution.**

\[
\begin{array}{c|c|c|c|c|c|c}
 & VII & VI & V & IV & III & II \\
\hline
 & 1, 13 & 0 & 0 & 0 & 0 & 0 \\
\end{array}
\]

**Comparable specimens.**

- Caldwell 1956: Plate VIII, h-i, m
- Collier et al., 1942: Plate II, t
- Lelander 1958: Fig.5, 47
- Osborne 1957: Plate 22, 9
- Osborne, Bryan and Crabtree 1961: Plate 52, 6, 32; Plate 56, bottom row

**Style 1** (Fig. 46, j-l)

**Number of specimens.** 5.

**Material.** Cryptocrystalline silica.
Measurements and description. These specimens possess relatively evenly rounded bases. The cross section is lenticular. Only two of the specimens are complete, measuring 5.0 x 2.9 x 0.8 cm., and 4.0 x 2.3 x 0.6 cm. All of the other specimens would have been larger, the largest being about 11 to 12 cm. in length, 2.5 cm. in width, and 0.9 cm. in thickness.

Technique of manufacture. These specimens were evidently roughed out with percussion and finished by means of pressure flaking.

Comments. None.

Distribution. Comparable specimens. None.

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<td>Material. Cryptocrystalline silica.</td>
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<tr>
<td>Measurements and description. These specimens are quite small, having short, square bases, straight edges, and lenticular cross sections. They measure 2.9 x 1.6 x 0.4 cm., and 2.1 x 1.4 x 0.5 cm.</td>
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<td>Technique of manufacture. These specimens appear to be products of pressure flaking.</td>
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<td>I: 0</td>
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Form 2 (Fig. 46, m)

Number of specimens. 1.

Material. Cryptocrystalline silica.

Measurements and description. This specimen has a square base with a contracting "stem." The edges are straight, and the cross section is shallow and hexagonal. This specimen measures 5.3 x 2.4 x 0.5 cm.

Technique of manufacture. This specimen is the product of pressure flaking.

Comments. None.


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<td>Material. Cryptocrystalline silica.</td>
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<tr>
<td>Measurements and description. This is a long, narrow triangular point the corners of whose base have been trimmed away diagonally. It measures 7.25 x 2.4 x 0.8 cm. The cross section is lenticular.</td>
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</table>
Technique of manufacture. This specimen appears to have been roughly out by means of percussion and finished with pressure flaking.

Comments. None.

Distribution. Comparable specimens. None.

This specimen was recovered from a very late Quilomene Bar Phase subcomponent.

Point or knife fragments. There are a total of 375 specimens from the site which may be described as projectile-point fragments or finely made knife fragments. Consisting of tips and body sections, most of these specimens are undoubtedly projectile-point fragments. Further identification is, of course, impossible.

Distribution.

Knives. A knife is defined as any chipped stone artifact with one or more regular, bifacially flaked edges which potentially may have formed a cutting implement. The category thus excludes projectile points on the basis of inferred function, core tools on the basis of irregular edges, thick and irregular cross section, and inferred function, and cobbles because most are unifacially flaked and because, as a group, they do not belong to the chipped-stone category. Groups whose members may have been used as both points and knives have also been treated separately. Such groups include semi-triangulars, pentagonals, and triangulars.

Although this definition is very broad, all but four of the 661 specimens categorized as knives in this report are patterned after the triangular and leaf-shaped outlines of projectile points. Many probably represent rudimentary stages in the manufacture of leaf-shaped, triangular, and semi-triangular points.

Distribution.

Type 1 (Figs. 7, g-h; 11, d; 15, k; 47, a-m)

Number of specimens. 159.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this type possess irregular convex edges and convex bases which may be evenly rounded or possess square or rounded corners. The tips are blunt, and the cross section varies from lenticular to plano-convex. In general, they are crude and bulky.
Technique of manufacture. These specimens were percussion flaked.

Comments. Unfortunately, the kind of artifact represented by this type is not often illustrated in archaeological reports, or is included in groups of similar specimens of which only the more finely worked are illustrated. Thus, though the temporal depth and continuity of this type at 45KT28 are indicative of a widespread distribution, it is difficult to pin down reported occurrences. Such reports have come from the East Kootenai Region of Canada (Borden 1956), from the Upper Columbia (Collier et al., 1942; Swanson 1962b), and possibly from Wakemap Mound (Caldwell 1956). While this comparative sample is limited, it embraces specimens from widely separated sites and deposits of substantially different ages. Therefore, the designation of "type" is in order.

Distribution.

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Comparable specimens.

Borden 1956: Plate IV, 6-7
Collier et al., 1942: Plate I, e
Massey and Nelson 1958: 49, 280b
Swanson 1962b: Fig. 4, n

Type 2 (Figs. 7, e-f; 12, i-j; 13, e; 15, j; 48)

Number of specimens. 10.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this type are basically leaf-shaped in outline, with a rounded base, convex edges, and blunt tips. Some of the specimens from Cultural Component III have one nearly straight edge and one noticeably convex edge (Fig. 12, i-j). All are crudely made, having thick lenticular or plano-convex cross section. Only one is complete, measuring 6.1 x 3.2 x 1.1 cm. Others may have attained a length of as much as 8.0 or 9.0 cm. and a width of 4.5 cm.

Technique of manufacture. The specimens in this type are the product of percussion flaking.

Comments. Unfortunately, this type must rest almost entirely upon its distribution within the deposits at 45KT28, where it is a characteristic artifact in all the phases but the very latest. Comparative specimens are restricted to Olcott type materials found along the Puget Sound littoral (Butler 1961; Thompson 1961).

Distribution. Comparable specimens. None.

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Style 1 (Fig. 49, a-d)

Number of specimens. 28.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight or convex edges and a straight base with square or slightly rounded corners. The cross section may be lenticular or plano-convex. The most striking feature is the base, which in most cases is merely the remnant of the striking platform of the Hake from which the knife was manufactured. The platform remnant is altered by only a few flakes thrown from it into the central portion of the knife's body adjoining the base. This basal thinning may have been done to accommodate hafting. Some of the specimens possess no platform remnants, but appear to be reworked knife tips.

Length  Width  Thickness
Extremes 2.5-7.8  1.7-4.0  0.6-1.1  
Modes 3.1-4.3  2.5-3.3  0.6-0.8  

Technique of manufacture. These specimens are the product of percussion flaking. Some were made from large flakes whose striking platforms were utilized as bases. Others were reworked from knife tips.

Comments. Though unreported in literature about the Plateau, this class of artifacts possesses a temporal distribution at 45KT28 large enough to be termed a style.

Distribution. Comparable specimens. None.

VII: A, 9; C, 1; D, 3; E, 3; F, 1; G, 1; H, 1; I, 1; undesignated, 7
VI: 0
V: 1
IV: 0
III: 0
II: 0
I: 0

Style 2 (Fig. 49, e-h)

Number of specimens. 11.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight, square-cornered bases which have been minimally thinned, convex edges, and a convex cutting or adzing bit. In some cases the base is formed by a striking platform but sometimes a broken knife is merely reworked. Four of the specimens look very much like side blades, being broader than they are long. These measure 2.2 x 4.8 x 0.8 cm., 1.9 x 3.5 x 0.9 cm., 2.4 x 3.3 x 0.9 cm., and 2.55 x 4.2 x 0.9 cm. The others are square or, in some cases, somewhat longer than they are wide. The measurements of these are summarized below.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>1.9-3.6</td>
<td>1.9-3.4</td>
</tr>
<tr>
<td>Modes</td>
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<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. These specimens were percussion flaked from thick flakes, core remnants, and knife fragments.

Comments. None.

Distribution. Comparable specimens. None.

VII: A, 6; G, 1; H, 3; I, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Style 3 (Fig.49, i-j)

Number of specimens. 6.

Material. Cryptocrystalline silica. [168]

Measurements and description. The specimens in this style appear to be reworked knife fragments. Evidently the first stage of manufacture was to break off the end of the knife, leaving a piece much the same shape as specimens in Style 2. Then the specimen was broken a second time from the edge, near the original knife base, to about the center of the first break. The broken edges then were slightly thinned. It is not clear whether bifacially flaked knife edges were the desired product or whether the burin-like bit formed at the intersection of the two breaks was to be used as a graving tool.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>3.2-5.7</td>
<td>2.05-3.6</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. See above, measurements and description.

Comments. None.

Distribution. Comparable specimens. None.

VII: A, 2; B, 1; H, 1; L, 1; undesignated, 1
The undesignated specimen is disputed between Subcomponents VII B and VIIF.

**Style 4** (Fig. 49, k-l)

*Number of specimens.* 4.

*Material.* Cryptocrystalline silica.

*Measurements and description.* Specimens in this group resemble wedges of pie. The base of the wedge or triangle is convex and has been flaked bifacially to form a cutting edge. The edges of these wedges were not sharpened, but merely thinned, perhaps for convenience in hafting or holding as a result, the cross section is rectangular. The straight edges of the wedge meet to form a sharp, burin-like bit, and on one specimen this bit shows signs of having been utilized.

The specimens in this group measure 4.8 x 2.95 x 0.7 cm., 4.5 x 3.1 x 0.8 cm., 4.1 x 2.0 x 0.95 cm., and 4.35 x 3.4 x 1.3 cm.

*Technique of manufacture.* These specimens are the product of percussion flaking. It is possible that they represent a stage in the manufacture of triangular points or knives.

*Comments.* None.

*Distribution.*  

**Comparable specimens.** None.

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>A, 1; B, 1; D, 1; G, 1</td>
</tr>
<tr>
<td>VI</td>
<td>0</td>
</tr>
<tr>
<td>V</td>
<td>0</td>
</tr>
<tr>
<td>IV</td>
<td>0</td>
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<tr>
<td>III</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>0</td>
</tr>
</tbody>
</table>

**Style 5** (Fig. 50, a-b)

*Number of Specimens.* 5.

*Material.* Cryptocrystalline silica.

*Measurements and description.* These specimens are thin, flat, rectangular slabs of petrified wood which have been trimmed along three edges and bifacially sharpened along the fourth. Only one is complete, measuring 6.8 x 3.5 x 0.8 cm. The largest fragmentary specimen measures *8.15 x 4.8 x 0.2 cm.*

*Technique of manufacture.* Two specimens, one undesignated and one from VIIA, appear to be pressure flaked. The others are percussion flaked.

*Comments.* None.

*Distribution.*  

**Comparable specimens.** None.

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>Occurrences</th>
</tr>
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<tbody>
<tr>
<td>VII</td>
<td>A, 1; B, 1; I, 2; undesignated, 1</td>
</tr>
<tr>
<td>VI</td>
<td>0</td>
</tr>
<tr>
<td>V</td>
<td>0</td>
</tr>
<tr>
<td>IV</td>
<td>0</td>
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<td>III</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>0</td>
</tr>
</tbody>
</table>

**Style 6** (Fig. 50, c-d)

*Number of specimens.* 3.

*Material.* Cryptocrystalline silica.

*Measurements and description.* These specimens resemble high, regular trapazoids in outline. They are bifacially flaked all the way round; the cross section is lenticular. These specimens measure 4.4 x 3.7 x 1.0 cm., 4.0 x 2.7 x 0.8 cm., and 3.0 x 2.7 x 0.8 cm.

*Technique of manufacture.* These specimens appear to be percussion flaked.
Comments. None.

Distribution. Comparable specimens. None.

<table>
<thead>
<tr>
<th>Style</th>
<th>Number of specimens</th>
<th>Material</th>
<th>Measurements and description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style 7</td>
<td>4</td>
<td>Cryptocrystalline silica.</td>
<td>These specimens are based on triangular flakes, the two longest edges of which have been bifacially flaked into cutting edges; the bases are totally unworked. Cross section is lenticular or plano-convex. The bulb of percussion of the smallest specimen is at the knife's tip (Fig. 50, f). This specimen measures 3.7 x 2.7 x 0.45 cm. On the larger specimens the bulb of percussion appears somewhere along the base. These specimens measure 4.8 x 3.2 x 1.0 cm., 7.0 x 3.65 x 1.4 cm., and 4.3 x 3.0 x 0.7 cm.</td>
</tr>
<tr>
<td>Style 8</td>
<td>5</td>
<td>Cryptocrystalline silica.</td>
<td>The specimens in this group are leaf-shaped knives with convex edges and slightly rounded bases. The cross section is thick and lenticular. All are incomplete. It is likely that they would have averaged 7.0 to 7.5 cm. in length, 3.0 to 3.5 cm. in width, and 0.8 to 1.1 cm. in thickness.</td>
</tr>
<tr>
<td>Style 9</td>
<td>4</td>
<td>Cryptocrystalline silica.</td>
<td>These specimens possess parallel edges and convex bases. The cross section is that of a parallelogram. All of the specimens are fragmentary; complete they would have ranged from about 3.5 to 4.5 cm. in length, from 2.1 to 2.6 cm. in width, and from 0.7 to 1.0 cm. in thickness.</td>
</tr>
</tbody>
</table>
Distribution. Comparable specimens. None.

VII: D, 1; undesignated, 2
VI: 0
V: 0
IV: 1
III: 0
II: 0
I: 0

Style 10 (Figs. 7, i; 51, a-b)

Number of specimens. 6.

Material. Cryptocrystalline silica.

Measurements and description. This style is characterized by straight edges and a straight base whose corners are square. The edges are nearly parallel to one another. The cross section is lenticular in four instances and that of a parallelogram in the remaining two specimens. All of the specimens in this style are fragmentary. They would probably have ranged from 3.5 to 5.0 cm. in length, from 2.4 to 3.3 cm. in width, and from 0.8 to 1.2 cm. in thickness.

Technique of manufacture. These specimens appear to be percussion flaked.

Comments. None.

Distribution. Comparable specimens. None.

VII: A, 2; B, 1; H, 1
VI: 0
V: 0
IV: 0
III: 1
II: 0
I: 1

Style 11 (Fig. 51, c-e)

Number of specimens. 4.

Material. Cryptocrystalline silica.

Measurements and description. These specimens are peripherally flaked, triangular chips with slightly convex edges and straight bases whose corners may be round or square. The original flake surfaces are visible over much of the area of the specimen. The cross section is thin and lenticular. Three are complete, measuring 3.8 x 1.7 x 0.4 cm., 3.2 x 1.7 x 0.25 cm., and 2.9 x 1.6 x 0.25 cm. The incomplete specimen is 4.0 cm. long and would have been about 2.1 cm. in width.

Technique of manufacture. These specimens appear to be the product of percussion flaking.

Comments. None. [172]

Distribution. Comparable specimens. None.

VII: A, 1; H, 1; I, 1; L, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0
I: 0

Form 1 (Fig. 51, f-g)

Number of specimens. 3.

Material. Cryptocrystalline silica.

Measurements and description. These specimens are the basal fragments of large, lanceolate knives with slightly convex edges and slightly indented bases. The cross section is thick and lenticular. In their fragmentary state, these specimens measure *4.7 x *2.8 x 0.9 cm., *3.4 x *3.45 x 0.9 cm., and *3.3 x *3.1 x 0.7 cm.

Technique of manufacture. These specimens are the product of percussion flaking.

Comments. None.
Form 2 (Fig. 51, h)

Number of specimens. 3.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess slightly convex edges and are nearly rectangular in outline. The long edges are bifacially flaked, and die base and tip are slightly thinned, but not sharpened. These specimens measure 4.4 x 3.0 x 0.9 cm., 4.2 x 2.4 x 0.6 cm., and 4.3 x 3.7 x 0.8 cm.

Technique of manufacture. These specimens are the product of percussion flaking.

Comments. None.

Distribution. Comparable specimens. None.

<table>
<thead>
<tr>
<th></th>
<th>VII: A, 3</th>
<th>VI: 0</th>
<th>V: 0</th>
<th>IV: 0</th>
<th>III: 0</th>
<th>II: 0</th>
<th>I: 0</th>
</tr>
</thead>
</table>

Form 3 (Fig. 51, i)

Number of specimens. 3.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess straight to convex edges which are parallel, round bases, and lenticular cross sections. All are fragmentary, measuring *5.0 x 2.5 x 0.6 cm., *4.2 x 2.6 x 05 cm., and *3.6 x 2.4 x 0.6 cm.

Technique of manufacture. These specimens appear to be the product of percussion flaking.

Comments. None.

Distribution. Comparable specimens. None.

<table>
<thead>
<tr>
<th></th>
<th>VII: A, 1; F, 1; undesignated, 1</th>
<th>VI: 0</th>
<th>V: 0</th>
<th>IV: 0</th>
<th>III: 0</th>
<th>II: 0</th>
<th>I: 0</th>
</tr>
</thead>
</table>

Form 4 (Figs. 14, 1; 51, j)

Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. These specimens possess convex edges and slightly convex bases with square corners. The cross section is shallow and lenticular. Fragmentary, these specimens measure *2.3 x *3.3 x 0.6 cm., and *1.7 x *2.8 x 0.35 cm.

Technique of manufacture. These specimens were percussion flaked.

Comments. None.

Distribution. Comparable specimens. None.

<table>
<thead>
<tr>
<th></th>
<th>VII: A, 1</th>
<th></th>
</tr>
</thead>
</table>
Form 5 (Fig. 51, k)

Number of specimens. 2.

Material. Cryptocrystalline silica.

Measurements and description. Small, peripherally flaked chips, these specimens have convex edges and concave bases with well-defined corners. The cross section of one specimen is plano-convex, that of the other lenticular. These specimens measure 1.9 x 1.7 x 0.4 cm., and 2.0 x 1.1 x 0.3 cm. [174]

Technique of manufacture. These specimens appear to be the products of pressure flaking.

Comments. None.

Distribution. Comparable specimens. None.

Form 6 (Fig. 52, j)

Number of specimens. 3.

Material Cryptocrystalline silica.

Measurements and description. These are peripherally flaked, triangular specimens with straight, though somewhat irregular edges, and convex bases. The original flake surfaces appear on each side of the specimen. The cross section may be lenticular or plano-convex. These specimens measure 3.2 x 2.2 x 0.7 cm., 3.0 x 2.2 x 0.4 cm., and 2.2 x 1.7 x 0.4 cm.

Technique of manufacture. These specimens appear to be the products of pressure flaking.

Comments. None.

Distribution. Comparable specimens. None.

Form 7 (Fig. 52, i)

Number of specimens. 4

Material. Cryptocrystalline silica.

Measurements and description. Each of the specimens in the group is simply a flake, one edge of which has been bifacially sharpened for cutting. The cutting edge is convex, the cross section triangular. Three of the specimens are complete, measuring 3.8 x 2.25 x 0.3 cm., 4.7 x 1.5 x 0.7 cm., and 4.7 x 4.0 x 12 cm.

Technique of manufacture. These specimens appear to be the product of percussion flaking.

Comments. None. [175]

Distribution. Comparable specimens. None.
Miscellaneous knives (Figs. 7, j; 14, k; 51, l-n; 52, a-h)

Number of specimens. 13.

Material. Cryptocrystalline silica.

Measurements and description. This group contains miscellaneous specimens, all of which are illustrated with the important data accompanying each illustration.

Technique of manufacture. See illustration notes.

Comments. None.

Distribution. Comparable specimens. None.

Knife Fragments

Number of specimens. 378.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group are fragments of knives and cannot be assigned to specific typological classes.

Technique of manufacture. Highly variable, technique relies mostly upon percussion flaking.

Comments. None.

Distribution. Comparable specimens. None.

Core tools. Core tools embrace all those implements manufactured from large chunks of cryptocrystalline silica by means of the removal of flakes, rather than by means of flake modification or utilization characteristic of all other chipped stone artifacts. Some, and particularly those in Style 1, probably never were utilized as tools. Others, and especially those in Type 2, represent cores or core remnants which were only slightly modified for use. Those in Type 1 and Form 1 evidently were prepared as tools and may not have functioned as cores in providing flakes specifically for utilization.

Of the 96 specimens recovered, 76 may be described as biface cores and 19 as uniface cores. The unifacially flaked specimens are all in Type III and are common in both early and late deposits at the site.
Type 1. Elongate Core Tools (Figs. 7, k-l; 12, f-g; 13, g, k; 17, a-b; 53, a-d)

Number of specimens. 17.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this type are bifacially flaked, elongate core tools whose cross section tends to be diamond shaped. They are long in comparison with their width and the width-length ratios of other core tools from the site. Occasionally there are use flakes or retouching along one of the edges.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>4.4-7.5</td>
<td>2.5-4.5</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>3.0-4.0</td>
</tr>
</tbody>
</table>

Technique of manufacture. These specimens are the product of percussion flaking.

Comments. This type is abundant during the earlier phases at the site, but rare during the Cayuse Phase. Unfortunately, it is this distribution on which the designation of type must rest as there seems to be no reported occurrences from the Plateau. However, lack of such comparative data may well be due to traditional ways of reporting artifact and detrital assemblages.

Distribution. Comparable specimens. None.

 VII:    B, 2; C, 2; D, 1; G, 2; H, 4; I, 3; L, 3; undesignated, 1
 VI:     2
  V:      3
 IV: or V: 1
 IV:     1
 III:    6
 II:     0
 I:      3 [177]

Type 2 (Figs. 17, c-d; 53, e-h)

Number of specimens. 70.

Material. Cryptocrystalline silica.

Measurements and description. For the most part specimens in this type tend to be small, being round or oval in outline and either bifacially or unifacially flaked. The cross section, always thick, is lenticular or hexagonal in the bifacially flaked specimens and plano-convex or triangular in the unifacially flaked specimens. Both types are distributed throughout the deposits at the site.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>1.7-6.2</td>
<td>1.5-5.1</td>
</tr>
<tr>
<td>Modes</td>
<td>2.6-5.2</td>
<td>2.1-4.2</td>
</tr>
</tbody>
</table>

Technique of manufacture. These specimens are the product of percussion flaking.

Comments. Though the specimens in this type are common in all the deposits at the site, use of the "type" designation suffers from the same weakness it does in the case of Type 1. There is no clearly reported comparative data, a situation probably due to the way site materials have been traditionally treated in the past.

Distribution. Comparable specimens. None.

 VII:    A, 25; B, 2; C, 2; D, 1; G, 2; H, 4; I, 3; L, 3; undesignated, 14
 VI:     7
  V:      0
 IV: or V: 1
 IV:     0
 III:    4
 II:     0
 I:      2

Form 1 (Fig. 53, i-j)

Number of specimens. 1.
Material. Cryptocrystalline silica.

Measurements and description. These bifacially flaked specimens have oval outlines and thick lenticular cross sections. They are very well made for core tools, measuring 6.3 x 3.9 x 2.0 cm., and 4.7 x 3.9 x 1.35 cm.

Technique of manufacture. These specimens are percussion flaked.

Comments. None.

Distribution. Comparable specimens. None.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>A, 1</td>
<td></td>
</tr>
<tr>
<td>VI</td>
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<td></td>
</tr>
<tr>
<td>V</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>IV: or V:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>IV:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>III:</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>II:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>I:</td>
<td>0 [178]</td>
<td></td>
</tr>
</tbody>
</table>

Form 2 (Fig. 53, k-l)

Number of specimens. 7.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group are of irregular size, shape and cross section. They are multifacially flaked and tend to be quite large.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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<tbody>
<tr>
<td>Extremes</td>
<td>5.05-8.1</td>
<td>3.0-4.3</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>none</td>
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</tbody>
</table>

Technique of manufacture. These specimens are percussion flaked.

Comments. None.

Distribution. Comparable specimens. None.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>VII:</td>
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<td>V:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>IV: or V:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>IV:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>III:</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>II:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>I:</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Scrapers. A scraper is defined as any unifacially flaked, chipped stone artifact whose inferred function was that of scraping. The category of scraper thus excludes gravers, microblades, and utilized flakes on the basis of function or technique of manufacture. It includes such tools as spoke shaves, end scrapers, and side scrapers. A total of 727 scrapers were recovered.

Distribution. Comparable specimens. None.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VII:</td>
<td>A, 148; B, 42; C, 21; D, 30; E, 3; F, 11; G, 19; H, 32; I, 56; L, 15; undesignated, 182</td>
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<tr>
<td>VI:</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>V:</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>IV: or V:</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>IV:</td>
<td>5</td>
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<tr>
<td>III:</td>
<td>56</td>
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<tr>
<td>I:</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>und.:</td>
<td>5 (resting on I)</td>
<td></td>
</tr>
</tbody>
</table>

Type 1. End Scrapers (Figs. 8, b; 12, h; 16, f-j, 54, a-n)

Number of specimens. 173.

Material. Cryptocrystalline silica.

Measurements and description. This diverse group is characterized by specimens with steeply keeled, unifacially flaked, convex scraping edges. At times such an edge takes advantage of the natural contours of a flake (Fig. 54, i-k, m).
Much more frequently, however, end scrapers are formed in the outline of a triangle or a rectangle. One of the rectangular specimens deriving from V1I-I possesses a stemmed base which suggests that it was probably hafted (Fig. 54, h). Many of the specimens are polished along the scraping edge, possibly from long use as fleshers. [179]

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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<tbody>
<tr>
<td>Extremes</td>
<td>1.5-7.1</td>
<td>1.4-5.3</td>
<td>0.3-1.6</td>
</tr>
<tr>
<td>Modes</td>
<td>1.9-4.5</td>
<td>1.4-4.0</td>
<td>0.5-0.9</td>
</tr>
</tbody>
</table>

**Technique of manufacture.** These specimens are percussion flaked.

**Comments.** The end scraper is a common trait throughout the Plateau and is probably present in every period of its prehistory.

**Distribution.**

<table>
<thead>
<tr>
<th>Period</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>L</th>
<th>Undesignated</th>
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</thead>
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</table>

**Comparable specimens.**

- Borden 1956: Plate VI, 30-35
- Caldwell 1956: Plate X, g-h
- Collier et al., 1942: Plate IV, l-q
- Cressman 1960: Fig. 45, h-n

**Type 2. Side Scrapers (Figs. 55 and 56)**

**Number of specimens.** 166.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens vary a great deal in size, shape, and proportion. Each possesses one or more unifacially flaked scraping edges, and the majority are based on purposefully struck flakes. For more detailed description, consult the various type variants.

**Technique of manufacture.** The specimens in this type may be the products of either pressure or percussion flaking.

**Comments.** Like end scrapers, side scrapers are a universal form in the Plateau.

**Distribution.**

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<tr>
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<th>C</th>
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</tbody>
</table>

**Comparable specimens.**

**Type Variant 2A. (Fig. 55, a-b)**

**Number of specimens.** 3. [180]

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens are characterized by long concave scraping edges. The rest of the flake is little modified, some trimming being evident. Two of these specimens are complete, measuring 6.2 x 2.9 x 0.6 cm., and 6.05 x 3.8 x 0.9 cm.

**Technique of manufacture.** See major type description.

**Comments.** None.

**Distribution.**

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</tr>
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</table>
**Type Variant 2B.** (Figs. 12, k; 55, c-d)

*Number of specimens.* 3.

*Material.* Cryptocrystalline silica.

*Measurements and description.* Each of these specimens possesses one convex scraping edge which intersects a straight scraping edge at an angle of ninety degrees or less. The base of the scraper is unmodified. These specimens measure 4.5 x 3.5 x 1.0 cm., 5.7 x 3.3 x 0.4 cm., and 5.05 x 3.4 x 0.6 cm.

*Technique of manufacture.* See major type description.

*Comments.* None.

**Distribution.* Comparable specimens. None.

<table>
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<tr>
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<th>IV</th>
<th>III</th>
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</table>

**Type Variant 2C.** (Figs. 8, a; 16, k-n; 55, e-o)

*Number of specimens.* 39.

*Material.* Cryptocrystalline silica.

*Measurements and description.* The specimens in this group vary a good deal in size, but all tend to be long and narrow with parallel-sided scraping edges. The cross section is usually shallow, and may vary from triangular to trapezoidal.

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<td>0.25-1.2 [181]</td>
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*Technique of manufacture.* See major type description.

*Comments.* None.

**Distribution.* Comparable specimens. None.

<table>
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<td>L</td>
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**Comparable specimens.**

Borden 1956: Plate VI, 21-29
Caldwell 1956: Plate IX, g-p
Collier et al., 1942; Plate IV, t-w
Cressman 1960: Fig. 29, a-d

**Type Variant 2D.** (Fig. 56, a-d)

*Number of specimens.* 121.

*Material.* Cryptocrystalline silica.

*Measurements and description.* These rather crude specimens have been manufactured from both flakes and splinters alike. Each possesses a single worked edge which is either straight or slightly convex. The cross section varies
from plano-convex, to triangular, to trapezoidal.

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*Technique of manufacture.* See major type description.

*Comments.* None.

*Distribution.*  
Comparable specimens. None.

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</table>

**Type 3. Spoke Shaves** (Figs. 8, c, k; 12, c-d; 14, n; 56, e-g; 57)

*Number of specimens.* 25.

*Material.* Cryptocrystalline silica. [182]

*Measurements and description.* Each of the specimens in this type has been flaked and utilized so as to produce an even, concave scraping edge. All are made from purposefully struck flakes, save some of those in Type Variant 3B. For more detailed descriptions consult the type variants.

*Technique of manufacture.* These specimens are worked through utilization and pressure flaking.

*Comments.* None.

*Distribution.*  
Comparable specimens. See various type variants.

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<th>D</th>
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<td>1 (resting on I)</td>
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</table>

**Type Variant 3A** (Figs. 8, c, k; 12, c; 14, n; 56, e-g)

*Number of specimens.* 19.

*Material.* Cryptocrystalline silica.

*Measurements and description.* Each of these specimens, which are irregular in outline, possesses a small concave scraping surface. The flakes themselves are thin and purposefully struck, varying in cross section from triangular to trapezoidal.

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*Technique of manufacture.* See major type description.

*Comments.* None.

*Distribution.*  
Comparable specimens. See various type variants.

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<td>1 (resting on I)</td>
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</table>
Comparable specimens,
Gunkel, 1961: 178, Flake Draw-knives
Strong et al., 1930: Plate 16, k-l [183]

**Type Variant 3B (Figs. 12, d; 57)**

**Number of specimens.** 6.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens were manufactured from hefty flakes and core remnants. The actual scraping edge is formed by a negative bulb of percussion which was removed from a striking platform of a core or from a thick flake.

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**Technique of manufacture.** See major type description.

**Comments.** None.

**Distribution.**  Comparable specimens. None

<table>
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<tr>
<td>I</td>
<td>0</td>
</tr>
<tr>
<td>und.:</td>
<td>1 (resting on I)</td>
</tr>
</tbody>
</table>

**Style 1 (Fig. 58, a-e)**

**Number of specimens.** 95.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens are described far better by the drawings in Figure 58 than they might be by words. Basically, each involves the flaking of the particular kind of edge shown in the cross sections in Figure 58. The worked edge itself may have been used like that of a large gouge, or it may represent some stage in the manufacture of other kinds of artifacts.

<table>
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<td>Modes</td>
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<td>0.7-1.2</td>
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</table>

**Technique of manufacture.** These specimens are the product of percussion flaking.

**Comments.** None.

**Distribution.**  Comparable specimens. None

<table>
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<th>A, 23; B, 7; C, 4; D, 3; F, 1; G, 2; H, 3; I, 3; undesignated, 33</th>
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<tr>
<td>I</td>
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</tr>
<tr>
<td>und.:</td>
<td>1 (resting on I)</td>
</tr>
</tbody>
</table>

**Style 2 (Fig. 58, f-g)**

**Number of specimens.** 16.

**Material.** Cryptocrystalline silica.

**Measurements and description.** These specimens, similar in technique of workmanship to those of Style 1, possess convex scraping edges. They are made from large splinters of material, and are flaked in the manner shown in Figure 58. Only four are complete; they measure 4.6 x 3.5 x 2.8 cm., 4.95 x 3.85 x 2.5 cm., 4.7 x 2.4 x 1.4 cm., and 3.7 x 2.5 x 1.7 cm.
Technique of manufacture. These specimens are the products of percussion flaking.

Comments. None.

Distribution.  

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<th>Number</th>
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<td>A, 2; F, 2; G, 1; L, 2; undesignated, 6</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>und.</td>
<td>2 (resting on I)</td>
<td></td>
</tr>
</tbody>
</table>

Comparable specimens. None

Style 3 (Fig. 56, j)

Number of specimens. 34.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group are manufactured from large flakes of irregular outline and cross section. They are roughly shaped with a few large percussion flakes and then utilized. Retouching is rare.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Extremes</th>
<th>Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>2.8-5.9</td>
<td>3.1-5.3</td>
</tr>
<tr>
<td>Width</td>
<td>1.5-4.0</td>
<td>2.5-3.4</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.6-2.4</td>
<td>0.8-1.3</td>
</tr>
</tbody>
</table>

Technique of manufacture. These specimens are the products of percussion flaking and utilization.

Comments. None.

Distribution.  

<table>
<thead>
<tr>
<th>Level</th>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>A, 10; B, 2; D, 2; F, 1; G, 1; H, 1; undesignated, 9</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1 [185]</td>
<td></td>
</tr>
</tbody>
</table>

Comparable specimens. None

Style 4 (Fig. 56, k-l)

Number of specimens. 15.

Material. Cryptocrystalline silica.

Measurements and description. The specimens to this group are large and thick, with convex or straight scraping edges and irregular outlines. The cross sections are also variable, tending to gravitate about triangular and plano-convex. Only one appears to be complete, measuring 7.3 x 5.6 x 3.8 cm. Most of the others would have exceeded this size, though it cannot be determined by exactly how much. Two or three may have been slightly smaller.

Technique of manufacture. These specimens are the products of percussion flaking.

Comments. None.

Distribution.  

<table>
<thead>
<tr>
<th>Level</th>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>A, 1; undesignated, 3</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Comparable specimens. None.

Form 1 (Fig. 8, l)

Number of specimens. 1.
Material. Cryptocrystalline silica.

Measurements and description. This specimen is a large, almost square artifact with two parallel scraping edges formed first by percussion flaking and then retouched with utilization. The cross section is plano-convex. This specimen measures 5.1 x 5.9 x 1.6 cm.

Technique of manufacture. This specimen is the product of percussion flaking.

Comments. None.

Distribution. Comparable specimens. None

<table>
<thead>
<tr>
<th></th>
<th>VII</th>
<th>VI</th>
<th>V</th>
<th>IV</th>
<th>III</th>
<th>II</th>
<th>I</th>
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<tbody>
<tr>
<td>und.:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Fragments of Well Made End and Side Scrapers

Number of specimens. 83.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this group are small fragments of scrapers which would fall into Type 1 and Type Variants 2A, 2B, and 2C. Unfortunately, more specific identification is not possible.

Technique of manufacture. The specimens in this group are the product of pressure flaking.

Comments. None.

Distribution. Comparable specimens. None

<table>
<thead>
<tr>
<th></th>
<th>VII</th>
<th>VI</th>
<th>V</th>
<th>IV</th>
<th>III</th>
<th>II</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, 18; B, 7; C, 2; D, 1; F, 2; G, 2; H, 5; I, 3; L, 2; undesignated, 27</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>0</td>
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</tbody>
</table>

Scraper Fragments

Number of specimens. 119.

Material. Cryptocrystalline silica.

Measurements and description. The fragments subsumed under this heading may have derived from Type Variant 2D and Styles 1 through 3. More specific identification is not possible.

Technique of manufacture. These specimens are probably all the products of percussion flaking.

Comments. None.

Distribution. Comparable specimens. None

<table>
<thead>
<tr>
<th></th>
<th>VII</th>
<th>VI</th>
<th>V</th>
<th>IV</th>
<th>III</th>
<th>II</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, 17; B, 10; C, 3; D, 2; E, 1; F, 1; G, 3; H, 2; I, 4; L, 4; undesignated, 38</td>
<td>7</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>0</td>
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</tbody>
</table>

Gravers. A graver is defined as any unifacially flaked, pointed implement of chipped stone whose inferred function is incising or grooving. A total of 46 gravers were recovered. [187]

Distribution. Comparable specimens. None

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<thead>
<tr>
<th></th>
<th>VII</th>
<th>VI</th>
<th>V</th>
<th>IV</th>
<th>III</th>
<th>II</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, 7; B, 4; C, 1; D, 4; E, 1; F, 1; G, 1; H, 3; I, 5; L, 1; undesignated, 7</td>
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</tbody>
</table>
Type 1 (Figs. 16, d-e; 59, a-e)

Number of specimens. 31.

Material. Cryptocrystalline silica.

Measurements and description. The specimens in this type possess deliberately shaped bodies from which project curved, beak-like points designed for engraving. They are well made, the basic outline gravitating around triangular and rectangular. The cross section of the body may be triangular, plano-convex, or trapezoidal; the cross section of the graving point is triangular.

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<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>2.2-8.3</td>
<td>1.5-3.25</td>
<td>0.4-1.3</td>
</tr>
<tr>
<td>Modes</td>
<td>2.8-4.3</td>
<td>none</td>
<td>0.5-0.7</td>
</tr>
</tbody>
</table>

Technique of manufacture. The specimens in this group appear to be the products of pressure flaking.

Comments. Gravers of this type are found throughout the Plateau at a comparatively recent time level. Because they are a specialized tool, gravers also are rare and therefore difficult to locate in earlier assemblages where data are restricted. Although apparently common throughout Medithermal times, their existence in earlier periods remains to be demonstrated.

Distribution.

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<td>VII:</td>
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<td>VI:</td>
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<tr>
<td>V:</td>
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<tr>
<td>IV:</td>
</tr>
<tr>
<td>III:</td>
</tr>
<tr>
<td>II:</td>
</tr>
<tr>
<td>I:</td>
</tr>
</tbody>
</table>

Comparable specimens.

Borden 1956: Plate VI, 12
Caldwell 1956: Plate X, m-s
Collier, et al., 1942: Plate IV, e-k
Daugherty 1952: Fig. 114, 2
Nelson 1962b; Fig. 8, a

Style 1 (Figs. 12, b; 13, f, j; 17, f; 59, f-h)

Number of specimens. 13.

Material. Cryptocrystalline silica. [188]

Measurements and description. The specimens in this style are large and crude, being minimally shaped and possessing blunt graving points. The secondary flaking in the area of the graving point is evidently a product of utilization. The cross sections and outlines are irregular.

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>2.4-6.8</td>
<td>1.0-3.5</td>
<td>0.5-2.1</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>2.1-3.0</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. These specimens are the products of percussion flaking and utilization.

Comments. None.

Distribution. Comparable specimens. Cressman 1960: Fig. 46, e-f

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<tbody>
<tr>
<td>VII:</td>
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<tr>
<td>VI:</td>
</tr>
<tr>
<td>V:</td>
</tr>
<tr>
<td>IV: or V:</td>
</tr>
<tr>
<td>IV:</td>
</tr>
</tbody>
</table>
Form 1 (Fig. 59, i-j)

Number of specimens. 2.

Material Cryptocrystalline silica.

Measurements and description. The specimens in this form are thin, flat flake gravers which have been carefully shaped through pressure flaking. Each has been modified at the base for hafting, one being corner removed and the other possessing two shallow basal notches. The cross sections of these specimens are thin and triangular. These gravers measure 3.2 x 1.45 x 0.3 cm., and 3.1 x 1.5 x 0.3 cm.

Technique of manufacture. These specimens are the products of pressure flaking.

Comments. None.

Distribution. Comparable specimens. None

<table>
<thead>
<tr>
<th></th>
<th>VII:</th>
<th>VI:</th>
<th>V:</th>
<th>IV:</th>
<th>III:</th>
<th>II:</th>
<th>I:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D, 1; I, 1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Drills and Awls (Figs. 8, j; 15, i; 59, k-r). The title of this category owes more to strong tradition than to ethnographic or functional data, for though the term "drill" is commonly applied to all of the forms illustrated in Figure 25, it is likely that only a fraction actually were used to drill holes. Ethnographically, hafted stone drills are reported for the Lower Chinook, the Sanpoil, Lower Carrier and Kutenai. They were used occasionally among the Thompson, but may have been absent among the Klikitat, Kalispel, and Lillooet (Ray 1942:146). It is thus probable that the stone drill was nearly universally used in the Plateau during the historic period. True to ethnographic description, many specimens termed drills by archaeologists are suitable for hafting, but like their companion specimens, they rarely if ever show any signs of utilization. When used to drill soft steatite or wood of any thickness these so-called drills flake away rapidly. Many of the most finely made have long slender shanks which break under minimum pressure. Such specimens would be suitable for drilling only the softest of materials. There is thus some question as to the usefulness of chipped stone drills.

Drills also may have had other uses. The Wishram (Spier and Sapir 1930:188) and the Coeur d'Alene (Telt 1930:43) are said to have used stone awls in the manufacture of basketry. Others, such as that in Figure 59, m, may have served as projectile points, while specimens such as r in Figure 59 may be nothing more than resharpened points.

The 35 drills recovered from 45KT28 include both complete specimens and fragments. The range of forms represented may be seen in Figure 59. Of these the most common varieties were the T-drill (k, l, p, q) and the flake drill (n, o), both of which occurred throughout the Cayuse Phase. All earlier specimens are fragmentary, but probably they resembled the one shown in Figure 59, m. The specimen from Cultural Component II, which was a re-worked stemmed point (Type 1), is an exception.

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>1.6-6.55</td>
<td>0.8-4.0</td>
<td>0.2-1.1</td>
</tr>
<tr>
<td>Modes</td>
<td>3.1-4.8</td>
<td>1.0-2.2</td>
<td>none</td>
</tr>
</tbody>
</table>

Distribution.

<table>
<thead>
<tr>
<th></th>
<th>VII:</th>
<th>VI:</th>
<th>V:</th>
<th>IV:</th>
<th>III:</th>
<th>II:</th>
<th>I:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, 5; B, 5; C, 2; D, 3; E, 1; F, 1, I, 10; L, 1; undesignated, 2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Comparable specimens.

Borden 1956: Plate VI. 14-17
Collier et al., 1942: Plate IV, a-d
Cressman 1960: Fig. 14d, top row
Gunkel 1961: Fig. 27, e-h
Malouf 1956: Plate II, level III
**Chisel.** This specimen is a narrow rectangle of petrified wood, one end of which has been bifacially flaked into a cutting edge. It measure 7.2 x 2.5 x 0.9 cm., and derives from Cultural Component VII.

**Bifacially Flaked Hand Tool** (Fig. 60). This specimen, which was bifacially flaked from a large spall, is roughly oval in outline. It has been flaked to a sharp edge everywhere except at the base of the striking platform. The cross section is thick and lenticular. This specimen measures 11.5 x 7.9 x 2.6 cm. It was recovered from a cache pit at the base of Stratum 6 beneath House Pit VII G and is probably contemporary with VIIA.

**Crescent Fragment (?)** (Fig. 8, d). This specimen has been tentatively identified as a crescent fragment similar in type to those recovered at Lind Coulee (Daugherty 1956a). Having a lenticular cross section, this specimen measures *2.2 x 2.1 x 0.7 cm. It derives from Cultural Component I. [190]

**Blades and Cores** (Figs. 61 and 62). Questions surrounding the production of true blades are always difficult because there is little agreement among Northwest archaeologists as to the minimal criteria by which the existence of such an industry may be validly established. If one were to make positive and negative bulbs of percussion, blade-like form, with utilization the major criteria, 50 to 75 of the utilized flakes from 45KT28 would be termed true blades. If, however, one adds the existence of cores, it becomes difficult to demonstrate the existence of a true blade industry, the only acceptable report of microblades being that of Osborne (1959) for the Windy Springs site at Sun Lakes.

Twenty-three possible microblades and three possible cores were recovered from 45KT28. All of the cores and five of the blades, none of which showed signs of utilization, were recovered from Cultural Component III (Figs. 61, a-b; 62). The remaining blades derive from Cultural Components I, VI and VII, being most common from VII. Two of these (Fig. 61, g-h) have been utilized.

In addition to the two possible microblade cores (Fig. 62), a large core, measuring 12.4 x 10.9 x 7.5 cm., was recovered in a deposit resting on Cultural Component I (Fig. 9). It may have been used in the production of large blade-like flakes.

<table>
<thead>
<tr>
<th>Extremes</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.5-5.1</td>
<td>0.7-2.8</td>
<td>0.2-0.5</td>
</tr>
</tbody>
</table>

**Distribution of Blades.**

- VII: A, 4; B, 1; F, 1; G, 1; H, 2; L, 1; undesignated, 3
- VI: 3
- V: 0
- IV: 0
- III: 5
- II: 0
- I: 2

**Utilized Flakes** (Fig. 63). The 864 utilized flakes from 45KT28 have been divided into two primary groups: those which are deliberately struck flakes displaying bulbs of percussion, and those utilized splinters and chunks which were apparently accidental byproducts of flaking artifacts, core trimming, and the like. In addition there is a third group consisting of fragments of knives which have served as utilized flakes. The distribution of these three groups of utilized flakes may be seen in Table 3, where the first group has been divided into several subgroups on the basis of size. It should be noted that the low percentage of utilized flakes from Subcomponent VII-I is a result of the fact that level bags were not kept during its excavation. Level bags from other subcomponents at the site yielded large numbers of utilized flakes missed in the preliminary field inspection.

**Basalt Spall Scrapers** (Fig. 64)

Seventy-seven spall scrapers of basalt, schist and quartzite were recovered. Typically they possess an oval outline, a bifacially flaked periphery, and a very shallow lenticular cross section. Seven have highly polished edges.

<table>
<thead>
<tr>
<th>Extremes</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.2-17.1</td>
<td>2.2-11.0</td>
<td>0.2-2.5</td>
</tr>
</tbody>
</table>

Of the 17 tribes covered in Ray's culture element distribution study (1942:126), 14 are said to have used implements similar to these for hide stretching during the tanning process. [191]
The two specimens which predate VII do not fall within the modal range of variation of this group, but are somewhat irregular in cross section and outline. The specimens from VIID and VIIH were found in caches on their respective house floors.

*Comparable specimens.*

- Borden 1956: Plate VII, 1-3
- Collier et al., 1942: Plate VI
- Gunkel 1961: Fig. 28
- Osborne 1956-57: Photo B
- Swanson 1962a: Fig. 30, j

**Large Edge-Worn fragments of Basalt**

The specimens in this category are large angular fragments of basalt, each of which possesses a sharp edge that has been polished through utilization. These specimens measure 23.0 x 14.0 x 8.4 cm., and 17.0 x 10.0 x 7.5 cm.

The specimens in this category may have had a function similar to that possessed by basalt spall scrapers. That is, they may have been used in the stretching of small hides by pulling the skin back and forth over the edge of the implement rather than moving the implement over the surface of the skin.

*Distribution.*

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>A, 1</td>
<td>F, 1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

**Edge-Ground Basalt Spall**

This specimen is similar to edge-ground cobbles in that one of its edges has been ground into a smooth, convex surface or facet. The only edge-ground artifact from the excavations, it measures 9.2 x 6.7 x 1.3 cm. and derives from Cultural Component V.

**Cobble Scraping Planes (Fig. 65)**

The seven specimens in this category are steeply faced, unifacially flaked cobbles of basalt. The worked edges intersect flat surfaces, making these specimens ideal scraping plains. However, two may have also been used as choppers.[192]

Four of the specimens derive from Cultural Component III and thus date from the early Frenchman Springs Phase. The other three were found in deposits resting on Cultural Component I and may represent either the late Vantage or early Frenchman Springs Phase.

These specimens may be related to the early cobble industry which Borden has reported from the early components of DjRi3 as well as to the early cobble forms common along the Snake River.

**Miscellaneous Flaked Cobble Tools**

Most of the 25 specimens in this category are fragments which are not diagnostic. Others of more interest are shown in Figure 66, where they are accompanied by pertinent data for each specimen.

*Distribution.*

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<tbody>
<tr>
<td></td>
<td>A, 4</td>
<td>B, 3</td>
<td>C, 1</td>
<td>D, 1</td>
<td>H, 2</td>
<td>5</td>
<td>0</td>
<td>1</td>
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</tbody>
</table>

**Stone Tools of Percussion**
This category contains 52 specimens probably used in hammering, crushing, and other percussion activities. It includes pestles, hammerstones, and an anvil stone.

### Distribution

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>VII: A, 9; B, 4; C, 2; D, 1; G, 1; H, 10; I, 4; undesignated, 15</th>
<th>VI: 2</th>
<th>V: 0</th>
<th>IV: or V: 1</th>
<th>IV: 1</th>
<th>III: 0</th>
<th>II: 0</th>
<th>I: 0</th>
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</tbody>
</table>

**Comparable specimens.** None

**Pestles** (Fig. 67, a-c) These seven specimens probably served both as food pounders and as hammerstones, as the striking platforms are characteristically battered. Two (Fig. 67, c) are naturally cylindrical cobbles, the ends of which have been heavily utilized. Both derive from Subcomponent VIIH and measure 15.2 x 5.1 x 5.1 cm., and 11.4 x 5.4 x 5.4 cm. The others have been deliberately shaped into tapering cylinders by means of pecking. Of these, three are complete, measuring 7.85 x 6.3 x 6.3 cm., 17.9 x 7.8 x 5.0 cm., and 19.3 x 5.9 x 5.3 cm. The third specimen (Fig. 67, b) possesses an enlarged striking platform similar to that of a hand maul. Its top is also unusual in that it is slightly hooked, and so resembles a specific type of pestle reported among the Sanpoil and Nespelem (Ray 1932:43).

**Technique of manufacture.** These specimens are the products of pecking, battering, and utilization.

**Comments.** Stone pestles have been reported for nearly every Plateau group, notable exceptions being Aft ChUcotin and Lower Carrier (Ray 1942). They have been grouped with the percussion Implements in this report because all are battered around their striking platforms and none display any actually ground facets. [193]

### Distribution

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>VII: G, 1; H, 3; I, 2; undesignated, 1</th>
<th>VI: 0</th>
<th>V: 0</th>
<th>IV: 0</th>
<th>III: 0</th>
<th>II: 0</th>
<th>I: 0</th>
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</table>

The undesignated specimen derives from material disputed between Subcomponents VIIF and VIIB.

**Comparable specimens.**

Borden 1956: Plate III, 2
Caldwell 1956: Plate 16, a
Gunkel 1961: Fig. 40
Osborne 1957: Plate 17, 1; Plate 20, b
Osborne, Bryan, and Crabtree 1961: Plate 51b, 47

**Hammerstones.** Excluding pestles, only 23 cobbles were recovered which exhibited signs of pecking, pounding, or battering. These have been divided into three styles and one form, according to utilization patterns and general form.

### Distribution

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>VII: A, 6; B, 1; C, 2; D, 1; I, 1; undesignated, 8</th>
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<th>V: 0</th>
<th>IV: or V: 1</th>
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</tbody>
</table>

**Style 1** (Fig. 67, d-f)

**Number of specimens.** 11.

**Material.** Basaltic and andesitic materials.

**Measurements and description.** These specimens were manufactured from naturally occurring river cobbles of varying sizes and shapes. As a rule one or both of the narrower ends of the cobble are faceted with pecked surfaces which appear to be the product of utilization. However, in one case (Fig. 67, d), a pecked facet runs along the edge of the cobble.
Another of these hammerstones has been further modified by pecking shallow, circular pits at various points on its surface. The function of these is not known. Two of the other specimens, one each from Cultural Components VI and VII, were heavily battered.

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
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<tr>
<td>Extremes</td>
<td>8.8-17.4</td>
<td>5.5-10.5</td>
<td>3.3-6.4</td>
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<tr>
<td>Modes</td>
<td>none</td>
<td>5.5-8.6</td>
<td>none</td>
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</tbody>
</table>

**Technique of manufacture.** These specimens are solely the products of utilization. [194]

**Comments.** None.

**Distribution.**

<table>
<thead>
<tr>
<th>Culture Component</th>
<th>Specimens</th>
</tr>
</thead>
<tbody>
<tr>
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<td>II</td>
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<tr>
<td>I</td>
<td>1</td>
</tr>
</tbody>
</table>

**Style 2 (Fig. 68, d-e)**

- **Number of specimens.** 4.
- **Material.** Basaltic and andesitic rocks.

**Measurements and description.** These specimens, which may best be described as pecking stones, were manufactured from the ends of long, narrow cobbles, which were utilized without any preparation. Utilization scars are confined to a small pecked facet at the terminus of the cobble fragment. One of the specimens, measuring 8.0 x 4.5 x 3.2 cm., is oval in cross section. The others are subtriangular in cross section. They measure 6.2 x 3.3 x 2.1 cm., 6.2 x 5.5 x 3.2 cm., and 4.85 x 4.2 x 3.0 cm.

**Technique of manufacture.** The end of a long, narrow cobbie is separated by means of percussion. It is then ready for use, probably as a pecking stone in the manufacture of rather delicate pecked and ground stone objects, or as an implement of finely controlled percussion flaking.

**Comments.** Although virtually unreported in site reports, I have seen many comparable specimens in collections from sites along both the Snake and Columbia rivers.

**Distribution.**

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<thead>
<tr>
<th>Culture Component</th>
<th>Specimens</th>
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<td>II</td>
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</table>

These four specimens derive from deposits spanning all of Cultural Component VII.

**Style 3 Peripherally Battered Hammerstones (Fig. 68, a-c)**

- **Number of specimens.** 7.
- **Material.** Basaltic and andesitic rocks.

**Measurements and description.** These specimens were manufactured from cylindrical and oval cobbles, the ends of which were first broken away. The flat surface formed by this fracture served as the striking platform. The unusual and diagnostic feature of each of these specimens is the fact that this platform has been utilized only around its periphery. Since utilization was extensive in all but one case, it is probable that the striking platform itself was never intended for use. [195]

In two instances (Fig. 68, a) the narrow end of the cobble was also battered.

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<tr>
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<tr>
<td>Extremes</td>
<td>7.0-18.1</td>
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<td>2.8-7.7</td>
</tr>
<tr>
<td>Modes</td>
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**Technique of manufacture.** These specimens appear to be the products of utilization only.

**Comments.** The utilization pattern suggests that these specimens may have been used as percussion implements.
in the manufacture of chipped stone artifacts.

**Distribution.**

<table>
<thead>
<tr>
<th>Component</th>
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<th>C</th>
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The undesignated specimens all postdate Subcomponent V1IC.

**Form 1 Grooved Hammerstone** (Fig. 69)

**Number of specimens.** 1.

**Material.** Serpentine.

**Measurements and description.** This is a large polished, rectangular cobble of serpentine which has been three-quarter grooved for binding. This groove which is narrow, deep, and V-shaped in cross section, intersects a broad, shallow groove on the fourth surface. The latter was presumably designed to accommodate a handle, the former to bind the hammerstone to the handle. There is a well-battered striking platform at one end of the hammer-stone. This specimen measures 10.6 x 6.6 x 5.6 cm.

**Technique of manufacture.** Abrasives were used in polishing and grooving a naturally block-shaped cobble.

**Comments.** None.

**Distribution.**

<table>
<thead>
<tr>
<th>Component</th>
<th>A</th>
<th>Undesignated</th>
</tr>
</thead>
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**Crushing Implements.** Though most of the implements in this category are characterized by a bifacially flaked periphery, this initially sharp edge was not used to cut or scrape, but rather to batter or crush in a percussive fashion.

**Style I** (Fig. 70, a-f)

**Number of specimens.** 21.

**Material.** Basaltic and andesitic rocks.

**Measurements and description.** These specimens vary from oval to rectangular in outline and possess irregular cross sections, generally shallow in comparison with specimen size. River cobbles and splinters of talus were both used in the manufacture of these specimens, all of which are quite large. Each has been bifacially flaked along one or more edges which, in all cases, have been battered until quite dull.

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<tr>
<td>Extremes</td>
<td>8.4-18.2</td>
<td>6.6-13.6</td>
<td>0.6-8.5</td>
</tr>
<tr>
<td>Modes</td>
<td>10.2-17.0</td>
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<td>4.3-5.9</td>
</tr>
</tbody>
</table>

**Technique of manufacture.** These specimens are the products of percussion flaking.

**Comments.** None.

**Distribution.**

<table>
<thead>
<tr>
<th>Component</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>H</th>
<th>I</th>
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<td>1</td>
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**Anvil Stone.** A single specimen of the category was recovered from tile sands directly overlying Cultural Component I. It is a roughly rectangular cobble measuring 17.1 x 9.7 x 6.6 cm. which displays a number of pock-marks at
one end. Presumably these are the result of percussion blows.

**Hopper Mortars**

Five hopper mortars were recovered in the excavations and several dozen noted to the washed-out material on the beach. They are characterized by extremely shallow, circular depressions which have been pecked into round, square, or oval river cobbles and boulders. Three of the specimens recovered in the dig were complete. They measured 31.0 x 24.0 x 7.0 cm., 24.8 x 22.2 x 8.7 cm., and 16.0 x 12.0 x 4.4 cm.

Although stone grinding slabs, occasionally in association with hoppers of various kinds, have been reported for many groups in the northern Plateau (Ray 1942), there is no local ethnographic account of any such contrivance.

**Distribution.**

<table>
<thead>
<tr>
<th>Component</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<tbody>
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</tr>
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</table>

**Comparable specimens.**

- Daugherty 1952: Fig. 114c, 1
- Gunkel 1961; Fig. 33, b
- Osborne, Bryan, and Crabtree 1961: Plate 179b, 5a

**Anchor Stone (?)**

A large, groove-encircled, granite cobble was recovered from the beach in front of the site. It measures 18.4 x 11.5 x 10.2 cm. [197]

As stone anchors have been reported for the Umatilla, Kittittas, Wenatchee, and Kalispel (Ray 1942:158), it is speculated that this specimen is some sort of an anchor stone.

**Comparable specimens.**

- Borden 1956: Plate IV, 5
- Caldwell 1956: Plate XIV, o
- Shiner 1961: Plate 41b

**Notched Net Weights**

Although many were observed on the beach, only two notched net weights were recovered from the excavations, one coming from VIII, the other postdating Subcomponent VIIG. They measure 5.7 x 4.5 x 1.6 cm., and 6.9 x 4.8 x 1.5 cm. Each possesses two bifacially flaked notches placed at opposite ends on the long axis of the cobble.

It is an interesting fact that net weights of this type are not reported ethnographically, even though they are found in large numbers all along the Snake and Columbia rivers. Ray (1942:109) notes, however, that grooved stone net weights are common among Plateau peoples. As such specimens are comparatively rare in the archaeological record, it may be that these references are to notched weights.

**Comparable specimens.**

- Borden 1956: Plate IV, 1-3
- Gunkel 1961: Fig. 33, o
- Osborne 1957: Plate 18, 26-32
- Osborne, Bryan, and Crabtree 1961: Plate 53b, 132, 5g
- Shiner 1961: Plate 41b

**Ground Adzes (Fig. 71)**

Six ground adzes of serpentine and nephrite were recovered; five from Subcomponent VI1H, and one from VII-I. All possess bifacially ground bits, and three of the specimens from VI1H have obviously been used. The largest two specimens still possess side grooves from the manufacturing process. They measure 18.7 x 4.7 x 2.0 cm., and 11.4 x 4.8 x 1.9 cm. The remaining specimens measure 7.6 x 4.1 x 0.9 cm., 5.6 x 4.8 x 0.7 cm., 4.0 x 2.0 x 0.8 cm., and 7.9 x 4.5 x 1.5 cm.

**Comparable specimens.**

- Butler 1962: Fig. 4, e
- Collier et al., 1942: Plate XV. a-d
Abrasives.

A single sandstone abrasive was recovered from Subcomponent VIIB. It measures 11.5 x 10.5 x 1.2 cm., and shows signs of use on both sides. That this was the only implement of abrasion recovered suggests that ground stone and bone implements were polished with sand and wood, sand and hides, or some other method.

Pipes. (Fig. 72)

Three complete and two fragmentary pipes were recovered in the excavations. Three derive from Subcomponent VIIH; one from Subcomponent VIII; and one that postdates VIIIG. In addition, three pipe fragments were recovered which had been reworked into beads and pendants (Fig. 74, p. s-t). One of these, found in VIIH, definitely derives from a tubular pipe; the others are from VIIH and VIIA, respectively. [198]

One of the specimens from VIIH is an elbow pipe of alabaster-like material which measures 8.2 cm. in length and 3.8 cm. in height (Fig. 72, c). The bowl is 1.95 cm. in diameter, and the stem tapers from 1.6 cm. in diameter at its intersection with the bowl to 1.5 cm. at its terminus. The bowl has turned from yellow to brown through extensive use, and indentations at the end of the stem indicate that the pipe was held in the teeth while being smoked. The fragmentary bowl of another elbow pipe was also recovered from VIIH. Of basalt, it is 1.95 cm. in diameter.

The third specimen from VIIH resembles what Ray has termed the disc bowl pipe, a form found among at least seven tribes in the Plateau, including the Klikitat, Kittitas, Wenatchee, Sanpoil, and Coeur d'Alene (Ray 1942:188). Archaeological specimens have been reported from Yakima Valley (Smith 1910: Figs. 107, 109). This specimen has been carved into the forebody of a fish complete with eyes, mouth, gill slits, ribs, and stylized back, bone (Fig. 72, b). Red ochre has been placed along the backbone and in the gill slits and eyes, graphite at the corners of the mouth and in the first rib in back of each gill slit. The specimen measures 6.1 x 3.4 x 2.5 cm. and is of an unidentified igneous rock.

The specimen from VIIIH, directly overlying VIIH, appears to be the bowl of a composite elbow pipe (Fig. 72, a). It is 1.5 cm. in height, and tapers from 1.1 cm. in diameter at the top of the bowl to 0.8 cm. at the bottom, where there is a small flange to accommodate attachment to a pipestem. A nearly identical specimen is reported by Emory Strong (1960: Fig. 3).

The specimen from the fill above VIIIG is a rim shard which has been cut and broken, perhaps in the process of making beads or pendants of the fragments of a pipe.

Shaft Smoothers. (Fig. 73)

Four sandstone shatters were recovered, one from the beach in front of the site and one each from Subcomponents VIIB, VIIH, and VII-I. Each is rectangular in outline and cross section and was presumably one of a matched pair. Only one is complete, measuring 5.5 x 3.5 x 2.7 cm. A larger, fragmentary specimen measures 9.0 x 3.4 x 2.3 cm.

Similar shatters have been reported for the Tenino, Umatilla, Kalispel (Ray 1942:150), and for the Okanagon and Coeur d'Alene (Teit 1930:42, 218).

Beads and Pendants of Stone. (Fig. 74)

Forty-four objects definitely identifiable as ground stone beads or pendants were recovered from Cultural Components V and VII. Thirty-nine of these, it should be noted, were recovered from Subcomponent VIIH.

Distribution.

<table>
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<tr>
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<th>Recovery</th>
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<td>V:</td>
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Style 1 Disc Beads (Fig. 74, a-i)

Number of specimens. 23.

Material. Eight are basalt, four lignite, two serpentine, one slate, one sandstone, and six of unidentified materials. [199]

Measurements and description. As the materials listed above may suggest, these specimens do not represent a narrow technological tradition. Twenty-one have rectangular cross sections, one (from VIIA) a diamond-shaped cross section, and one bulging sides. The last seems to represent a type of bead common at the Congdon site, which is located near The Dalles (Weld, 1959:26, round-edged beads). Three of the beads, including the one from VIIA, have tubular...
perforations, two are conically drilled from one side only, and 18 are biconically drilled. These resemble Weld's flat-edges type of bead common at the Congdon site and characteristic of Indian Well II (1959:25.26). The edges of two beads are incised with diagonal lines, while the edge of another is incised with vertical lines and an encircling groove.

These disc beads range in diameter from 0.7 to 1.55 cm. The distribution between these figures is continuous and without modes.

**Technique of manufacture.** Aside from the presence of both conical and tubular perforation, no specific comments can be made about the process of manufacture.

**Comments.** The diversity of these specimens, all but one of which derives from Subcomponent VIIH, suggests that many sources are represented through trade.

**Distribution.**

<table>
<thead>
<tr>
<th></th>
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<th>VI:</th>
<th>V:</th>
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**Comparable specimens.** Weld 1959: Fig. 1

**Style 2  Graphite Beads and Pendants** (Figs. 74, j-m; 14, r-t)

**Number of specimens.** 8.

**Material.** Graphite.

**Measurements and description.** These specimens are of irregular size and shape. Those from Cultural Component V are the largest and have been perforated in the edges rather than the bead faces. All perforations are biconical.

These specimens range in length from 1.0 to 2.6 cm., and in width from 0.8 to 1.5 cm. Six of the eight are complete.

**Technique of manufacture.** These specimens are raw pieces of graphite which have been biconically drilled.

**Comments.** Scattered reports of graphite in association with archaeological remains (Swanson 1958:166; Nelson 1962b, 31A) and the use of graphite in the Frenchman Springs Phase at 45KT28 would seem to warrant the tentative designation of a style. Many possible source areas for graphite exist and have been tabulated by C. G. Nelson (1959), who indicates that the major concentration of such sources lies in the northern Plateau and adjacent Cascade Mountains. [200]

**Distribution.**

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**Comparable specimens.** None.

**Style 3  Tabular Slate Pendants with Convex Edges** (Fig. 74, n)

**Number of specimens.** 2.

**Material.** Slate.

**Measurements and description.** These specimens are flat, thin, tabular beads with convex edges and straight tops and bottoms. Each is biconically perforated at one end. Cross sections are rectangular, and the workmanship is fine. These specimens measure 3.0 x 0.9 x 0.3 cm., and 2.35 x 1.0 x 0.3 cm.

**Technique of manufacture.** Grinding and biconical perforation.

**Comments.** Since identical specimens have been reported from the Yakima Valley (Smith, 1910), the classification of style is tentatively advanced.

**Distribution.**

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**Comparable specimens.** Smith 1910: Fig. 81
Form 1 Tubular Stone Beads (Fig. 74, o)

Number of specimens. 2.

Material. One is of steatite, the other of basalt.

Measurements and description. The steatite specimen is larger, measuring 1.4 x 0.9 x 0.9 cm. It is tubular, and the perforation is also tubular. It is possible that it is a reworked pipe stem. The basalt specimen has been manufactured by perforating a small pebble with a tubular hole. It measures 0.8 x 0.6 x 0.4 cm.

Technique of manufacture. Grinding and tubular drilling.

Comments. None.

Distribution. Comparable specimens. None.

Form 2 Miscellaneous Rectangular Pendants (Fig. 74, q-w)

Number of specimens. 8.

Material. Three are steatite, two are slate, one is basalt, and two are of unidentified materials.

Measurements and description. These specimens, which vary a great deal in size and shape, may be seen in Figure 74 (q-w), where they are accompanied with pertinent data. Figure 74, r, closely resembles a pendant recovered from the Congdon site, near The Dalles (Weld 1959:34, yy).

Technique of manufacture. Grinding and biconically drilling.

Comments. None.

Distribution. Comparable specimens. None.

Form 3 Reworked Tubular Pipe Fragment (Fig. 74, p)

Number of specimens. 1.

Material. Unknown.

Measurements and description. This specimen appears to be the base, or flange, of a tubular pipe which has been reworked into a bead. It measures 1.0 x 1.5 x 1.5 cm.

Technique of manufacture. Grinding and drilling.

Comments. None.

Distribution. Comparable specimens. None.
Pieces of Ground and Drilled Steatite (Fig. 14, o)

Two small fragments of ground and drilled steatite were recovered, one each from Cultural Components IV and V. Because of their fragmentary condition, no specific function may be assigned to them.

Incised Slate Tablet (Fig. 75)

The fragment of a thick, diagonally hatched, slate tablet was recovered along the river bank in slough deriving from Cultural Component VII. It measures *6.5 x *4.6 x 2.1 cm. [202]

Ground Basalt Tablet

A naturally shaped, rectangular basalt tablet, extensively ground on one edge and a portion of one surface, was recovered from Subcomponent VIIA. It measures 9.0 x 5.6 x 3.0 cm.

Sandstone Balls (Fig. 74, x-y)

Five round sandstone balls were recovered from Subcomponent VIIH. Evidently manufactured by pecking and abrading the coarse sandstone from which they are made, these specimens vary from 1.5 to 2.5 cm. in diameter. The function of these objects is not known.

Ground Disc Fragment (Fig. 74, z)

The rim fragment of a naturally circular concretion which had been thinned and polished through grinding was recovered in midden postdating Subcomponent VIIA. If complete, this specimen would have measured approximately 5.6 cm. in diameter and 0.7 cm. in thickness.

Ground Basalt Object Fragment (Fig. 74, aa)

The heat-spalled fragment of an unidentified basalt object was recovered from Subcomponent VIIG. Possessing four ground facets, it resembles the bit of an adze, though it is much too thick to have been used for that purpose. It measures *1.6 x *1.5 x *1.0 cm.

Ocher Palettes

Two ocher palettes were recovered. One consists of a small, flat river cobble which is stained and ground on one surface. Deriving from Subcomponent VIIA, it measures 9.9 x 6.0 x 2.0 cm. The other is a large, flat, rectangular slab of basalt which has been ground and stained on its largest surface. It measures 15.1 x 17.8 x 9.0 cm., and derives from Cultural Component VII.

Ocher

Eight pieces of yellow ocher and 25 pieces of red ocher were recovered from Cultural Component VII. One specimen, from VIIC, displays a ground facet; the rest are unaltered.

The use of body, facial, protective, and decorative pigment was evidently universal in the Plateau during the ethnographic period (Ray 1942:165-66, 172). Some groups are also said to have used flat stone palettes for grinding ocher (Ray 1942:143), and Teit (1930:43, 218) indicates that ocher formed an important item of trade both within the Plateau and between the Plains and the Plateau.

Distribution of Yellow Ocher.

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Distribution of red ocher.

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Diatomaceous Earth.

Two pieces of diatomaceous earth were recovered. One postdates Subcomponent VIIG; the other is disputed between Subcomponents VIIC and VIIH.
The use of white pigment, for which diatomaceous earth might serve as a base, has been reported for the Coeur d'Alene, the Thompson, and the Okanagon (Teit 1930:43, 218).

**Bone and Antler Artifacts.**

A total of 465 bone and antler artifacts were recovered. Of these, 451 derive from Cultural Component VII, nine are from Cultural Component VI, and four are from Cultural Component V. Bone and antler were not preserved in Cultural Components I and II, and though they did occur in both Cultural Components III and IV, no bone or antler artifacts were recovered.

The small sample from Cultural Component III through VI is, in part, a reflection of the size of the total sample from these components. It is probably related also to over-all site-utilization patterns and the kinds of artifacts which come to be roost frequently associated with these patterns.

The sample from Cultural Component VII, on the other hand, is large enough to make some general statements regarding gross utilization patterns of both bone and antler. The picture here is one of stability, bone and antler being traditionally used for certain purposes throughout the component and thus throughout the Cayuse Phase. Awls and gaming dice are made exclusively of bone, while wedges, composite harpoon valves, and digging stick handles are always of antler. Other kinds of artifacts, such as needles, flaking implements, fleshers, projectile points, and barbs, are made, in varying proportions, of both materials.

Changes are restricted to minor shifts in specific form. Thus the decoration of gambling bones changes and artifacts of antler are more commonly decorated during the Cayuse I Subphase.

**Distribution of antler artifacts.**

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**Distribution of bone artifacts.**

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**Bone Awls.** A total of 101 awls were recovered, all from Cultural Component VII. Splinter, split metapodial, and L-shaped scapula awls are the three major types represented. Each is found consistently throughout the component and thus the Cayuse Phase.

**Distribution.**

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**Type 1 L-Shaped Scapula Awls.** (Figs. 76 and 77)

**Number of specimens.** 33.

**Material.** Deer scapulae.

**Measurements and desertion.** These specimens, which commonly vary from 8.5 to 17 cm. in length, possess long, parallel-sided shafts; sharp, tapered points; and small, L-shaped handles. The following measurements are based on six complete specimens.

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Technique of manufacture. From complete specimens and cut scapula detritus, it is inferred that L-awls were manufactured from the auxiliary borders of deer and possibly antelope scapulae by a fourfold process. The first two steps of the process are interchangeable, and consist of breaking away the scapula's articulation and cutting the axillary border from the remaining palm. In the cutting process, in which a stone knife or graver probably was used, a portion of the palm carefully was left attached to the distal terminus of the auxiliary border. This later formed the L-shaped handle of the awl. Cutting might be carried out so that the complete, pointed outline of the awl was formed, or it might be done in such a way that a long, parallel-sided shaft was formed. If such a shaft were sought first, the scapula's articulation might be left attached. In either case, the outer edge of the auxiliary border was trimmed through cutting. If the articulation was left in place, it was broken away from the end of the shaft. Then the shaft was split longitudinally, a long trough-shaped splinter of bone being removed. This left the final trimming and polishing to be done.

Comments. Encompassed in this type are nine complete or nearly complete specimens, five pieces of cut scapula (see Fig. 77), and 19 tip and shaft fragments. The latter can be identified easily, as the auxiliary border of the scapula is filled with spongy but sturdy bone. Since no other bone is of exactly the same structure, and since the auxiliary border was used in no other way, virtually all L-awl fragments can be identified. [205 ]

Distribution.

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Comparable specimens.

Caldwell 1956: 147, Class 3; Pl. XVIII, b
Osborne 1959: 193; Pl. VII, m
Osborne, Crabtree, and Bryan 1952: 365, Pl. 110; 366
Osborne and Shiner 1950: Pl. VIIIa, 31
Shiner 1952: Pl. IV, a
Smith 1910: 71; Fig. 57

Type 2 Split Metapodial Awls. (Fig. 78)

Number of specimens. 13.

Material. Deer metapodia.

Measurements and description. These specimens tend to be long and narrow, their tips usually arching smoothly back into their shafts. The cross section varies from irregularly rectangular to ovate.

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<td>6.7, 9.6, 12.9</td>
<td>1.2-1.4</td>
<td>none</td>
</tr>
</tbody>
</table>

Technique of manufacture. Two distinct processes appear to be involved in the manufacture of these specimens. In the process most frequently used, the metapodia were cut longitudinally with a chipped stone knife or graver. The long, parallel-sided shaft which this produced than was sharpened at one end, after which final shaping and polishing were completed. In the second process, metapodia were split by fire cracking or adzing rather than cut and broken.

Comments. None.

Distribution.

<table>
<thead>
<tr>
<th></th>
<th>VII:</th>
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<th>IV:</th>
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</table>

Comparable specimens.

Caldwell 1956: 144, Class 1; Pl. XI, m-n
Gunkel 1961: 214, Style 2
Osborne 1959: 91; Fig. V, k
Smith 1899: 148; Figs. 72, 74
Type 3  Splinter Awls  (Figs. 79 and 80)

Number of specimens. 30.

Material. Mammal long bones.

Measurements and description. These specimens vary a great deal in cross section and the excellence with which they were executed. Though in most cases there is a well-polished tip which merges smoothly with the shaft, several specimens are nothing but rude splinters of bone whose sharp ends have been utilized or only slightly modified prior to utilization. The six smallest specimens, ranging in length from 4.0 to 7.0 cm., are of this form (Fig. 80). As these all derive from Subcomponent VIH, it is possible that they may have possessed some specialized function.

<table>
<thead>
<tr>
<th>Length</th>
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<tr>
<td>Extremes</td>
<td>4.0-19.3</td>
<td>0.35-2.3</td>
</tr>
<tr>
<td>Modes</td>
<td>6.5, 7.3</td>
<td>0.9-1.3</td>
</tr>
</tbody>
</table>

Technique of manufacture. Though splinters sometimes were prepared by cutting out long narrow sections of long bone with a graver or chipped stone knife, the more usual method was simply to spilt or crush the long bone and select an appropriately shaped splinter. The splinter was then prepared for use by grinding a sharp point at one end and polishing the shaft. In some cases the splinter was used without alteration.

Comments. None.

Distribution.

| VII | A, 2; B, 5; D, 1; E, 1; H, 10; I, 8; undesignated, 3 |
| VI | 0 |
| V | 0 |
| IV | 0 |
| III | 0 |
| II | 0 (bone not preserved) |
| I | 0 (bone not preserved) |

Two of the undesignated specimens antedate Subcomponent VIIF; the other cannot be more specifically designated.

Comparable specimens.

- Gruhn 1961b:7; 21, Fig. 4, h
- Gunkel 1961:213, Style 1
- Mallory 1962: 14, Item 12; 65, Pl. IX, m
- Osborne 1959: 91; Fig. V, k
- Osborne and Shiner 1950: Pl. VIIa, 47

Style 1  Ulna Awl  (Fig. 81, b)

Number of specimens. 1.

Material. Ulna, probably that of a carnivore.

Measurements and description. This specimen possesses the outline of all regular ulna awls. The proximal end of the ulna forms the handle, while the central portion of the shaft has been cut and sharpened to form the awl's tip. This specimen measures 9.8 x 1.8 x 1.2 cm. [207]

Technique of manufacture. This specimen was manufactured by cutting the central portion of the shaft in a diagonal direction by means of a chipped stone knife or graver. This point was sharpened through grinding, and the proximal termination of the ulna was battered to provide a comfortable handle.

Comments. None.

Distribution.

| VII | 1, 1 |
| VI | 0 |
| V | 0 |
| IV | 0 |
| III | 0 |
| II | 0 (bone not preserved) |
| I | 0 (bone not preserved) |

Comparable specimens.

- Cressman 1960:42
- Osborne 1957:83
Form 1  Awl Manufactured from a Splinter of Rib Bone  (Fig. 81, a)

Number of specimens. 1.

Material. Rib bone.

Measurements and description. This specimen is of irregular outline and cross section, having a chunky, angular butt, and a flat, blade-like tip. It measures 7.3 x 1.2 x 0.6 cm.

Technique of manufacture. This specimen appears to be worked through utilization only.

Comments. None.

Distribution.

<table>
<thead>
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<th>V</th>
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</tr>
</tbody>
</table>

Form 2  Awl of Split Bird or Rodent Bone  (Fig. 81, c)

Number of specimens. 1.

Material. Bird or rodent bone.

Measurements and description. Measuring 5.3 x 0.45 x 0.2 cm., this specimen is narrow and parallel-sided, with smooth edges and a blunt tip.

Technique of manufacture. This specimen appears to have been altered slightly through grinding. It also has been worn heavily through use.

Comments. None. [208]

Distribution.  Comparable specimens. none,

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</table>

Awl Fragments

Number of specimens. 22.

Material. Mammal long bones.

Measurements and description. These fragmentary specimens derive from splinter and metapodial awls.

Technique of manufacture. None.

Comments. None.

Distribution.  Comparable specimens. None.

<table>
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<tr>
<th>VII</th>
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<th>IV</th>
<th>III</th>
<th>II</th>
<th>I</th>
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<tbody>
<tr>
<td>A, 1; C, 1; F, 1; H, 4; I, 11; undesignated, 4</td>
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</table>

Pins and Needles. There are 17 specimens in this group, four of bone, seven of antler, and six so completely altered by fire hardening that identification of the material used is not possible. The most readily identifiable of the specimens are two flat needles which probably were used in the weaving of mats. One, made of rib, is nearly complete, lacking only a portion of the eye (Fig. 82, g). It measures *13.9 x 0.65 x 0.15 cm. and derives from Subcomponent VIIB. The other, a tip fragment, is made of long bone from an unidentified mammal and measures *4.2 x 0.6 x 0.2 cm. It was recovered from Subcomponent VII-I. Specimens such as these probably were manufactured most often out of hardwood,
Ten decorated pins were recovered from Subcomponent VIIC. Of these only one, made of antler, was complete (Figs. 82, f; 83, a). Measuring 11.3 x 0.45 x 0.45 cm., it is incised with an elaborate double chevron design which is bordered by blocks of diagonal hatching. Its base is either the reworked eye of a needle or a deliberately made double knob. The fragment of a presumably identical specimen was recovered also. The double chevron motif occurs on two needle fragments recovered from shell heaps on the lower Fraser River (Smith 1903:181, Fig. 49, a-b). The encircling block of diagonal hatching appears near the base of a head scratcher from Kamloops, British Columbia (Smith 1903: 424, Fig. 362). The other eight specimens all axe fragmentary. Representative designs may be seen in Figure 83.

Two other decorated pins were recovered. One was found near the northern edge of the house pit designated Subcomponent VIIH. Because the lip of the house pit is very poorly defined in this particular area, it is impossible to say whether the pin derives from fill just within the house pit or midden just outside the lip, in which case it may be of somewhat greater age. The base of this specimen, which measures *11.9 x 0.8 x 0.5 cm., has been carved into the tail of a fish (Fig. 82, d). The remaining decorated pin derives from Subcomponent VII-I. It is a basal fragment measuring *11.9 x 0.3 x 0.3 cm. It is decorated with three shallowly incised, telescopic knobs (Fig. 82, c). [209]

In addition, the undecorated tip of a pin or needle was recovered from Subcomponent VII-I. It measures *11.0 x 0.3 x 0.3 cm. and probably possessed a decorated base.

The two remaining specimens in this group probably represent uneyed needles used in weaving or sewing mats or baskets. One of antler derives from Subcomponent VIIH and measures 15.8 x 0.7 x 0.3 (Fig. 82, a). It is very similar to a specimen reported from the interior of British Columbia (Smith 1913:421, Fig. 358, f). The other, of mammal long bone, is a basal fragment from Subcomponent VII-I which measures *10.4 x 0.5 x 0.35 cm. (Fig. 82. b).
Distribution:

- VII: H, 1; I, 1
- VI: 0
- V: 0
- IV: 0
- III: 0
- II: 0
- I: 0

Comparable specimens:

- Caldwell 1956: 150-51, Class 2: Pl. XVIII, f
- Collier et al., 1942:79
- Crabtree 1957: Pl. XXIII, i-j
- Lelander 1958: Fig. 28, 2-193 - 2-198
- Massey and Nelson 1958: 29, 165, 242
- Mills and Osborne 1952: Fig. 107, 1
- Strong, Schenck, and Steward 1930: 60; Pl. 6, j-n

Form 1 Miscellaneous Fragments of Composite Harpoon Valves (Fig. 84, a)

Number of specimens. 3.

Material. Antler.

Measurements and description. The most interesting of the specimens in this group is a fragment of the barb section of the valve which was recovered from Subcomponent VIID. Unlike the specimens of Type 1, it is pointed rather than rectangular in outline and has been incised with a series of triangles and zigzags (see Fig. 84, a). Very fragmentary, it measures *3.3 x 0.9 x 0.8 cm.

Another, from Subcomponent VII-I, is the barb section of what must have been an unusually large valve. It is sharply pointed and measures *4.8 x 1.0 x 0.5 cm.

The third specimen derives from Subcomponent VIIA and appears to have been a valve in the initial stages of socket drilling. As one end has been broken away, this specimen measures *3.8 x 0.6 x 0.4 cm.

Technique of manufacture. See this heading, Type 1.

Comments. None.

Distribution. Comparable specimens. None.

- VII: A, 1; D, 1; I, 1
- VI: 0
- V: 0
- IV: 0
- III: 0
- II: 0
- I: 0

Composite Harpoon Tips (Fig. 85, m-n). Only three specimens, which may be unquestionably classified as composite harpoon tips, were recovered. For comments on their ethnographic distribution, see the section on composite harpoon valves. [211]

Style 1 Cylindrical Composite Harpoon tips (Fig. 85, m-n)

Number of specimens. 3.

Material. One is of antler and two are of bone.

Measurements and description. Each of these specimens may be thought of as a small cylinder with a rounded base and a sharply pointed tip. The cross section is circular and the workmanship very fine. Only the bone specimens are complete, measuring 4.6 x 0.5 x 0.4 cm., and 4.1 x 0.5 x 0.5 cm.

Technique of manufacture. Grinding and polishing.

Comments. None.

Distribution. Comparable specimens. Collier et al., 1942: Pl. VIII, j

- VII: H, 2; I, 1
- VI: 0
Composite Harpoon Tips and/or Barbs of Three-Pronged Fish Spears (Fig. 85, i-1, o-p, r-s). The 11 specimens in this category are rather diverse in form, and their exact use is therefore obscure. The majority are too large to have served as composite harpoon tips, at least in association with Type 1 valves. And yet their general form is similar. Others are basally thinned (see Fig. 85, o-p) and may possibly have served as projectile points. The bulk, however, are probably best assigned the function of barbs for three-pronged salmon spears, an implement with a wide distribution in the Plateau (Ray 1942: 113).

**Distribution.**

- VII: A, 1; I, 5; undesignated, 5
- VI: 0
- V: 0
- IV: 0
- III: 0
- II: 0 (bone not preserved)
- I: 0 (bone not preserved)

**Type 1** (Fig. 85, j-l, r-s)

**Number of specimens.** 8.

**Material.** Five are of bone and three are of antler.

**Measurements and description.** These specimens, as those illustrated in Figure 85 reveal, vary considerably to the details of outline and cross section. All are, however, obviously designed to be halted, having definite bases and tips. They are thick and heavily constructed for their lengths, and two appear to have been broken while under a considerable amount of pressure (Fig. 85, r-s). [212]

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
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<th>Thickness</th>
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</thead>
<tbody>
<tr>
<td>Extremes</td>
<td>4.4-6.3</td>
<td>0.8-1.1</td>
<td>0.45-0.7</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>none</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**Technique of manufacture.** Grinding and polishing.

**Comments.** None.

**Distribution.**

- VII: H, 1; I, 4; undesignated, 3
- VI: 0
- V: 0
- IV: 0
- III: 0
- II: 0 (bone not preserved)
- I: 0 (bone not preserved)

**Comparable specimens.**

- Collier et al., 1942: Pl. VII, h
- Osborne, Bryan, and Crabtree 1961: Pl. 52b, 139

**Form 1 Miscellaneous Barbs or Composite Harpoon Tips.** (Fig. 85, i, o-p)

**Number of specimens.** 3.

**Material.** Two are of antler and one is of bone.

**Measurements and description.** The bone specimen has a fiat blade and is laterally thinned at the base. Measuring 5.3 x 0.6 x 0.4 cm., it may have had a variety of functions: a barb in a spear, a composite harpoon tip, or even a projectile point. It derives from Cultural Component VII. The smaller antler specimen (Fig. 85, p) measures 2.3 x 0.7 x 0.5 cm. Its base is transversely thinned, and it is remarkably like a specimen illustrated by Smith (1910: Fig. 7). The remaining specimen is a biconical antler point measuring 5.1 x 0.9 x 0.8 cm (Fig. 85, i). Similar to large specimens from Cultural Components VI and VII (see bone projectile points, Style 1). It may have been used as a point rather than a barb or composite harpoon tip.

**Technique of manufacture.** Grinding and polishing.
Comments. None.

Distribution.

| Subcomponent | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| VII          | 2 | 1 | 1 | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| VI           | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| V            | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| IV           | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| III          | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| II           | 0 | 0 | 0 | 0 | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| I            | 0 | 0 | 0 | 0 | 0  | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Undesignated |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

Comparable specimens.

Smith 1910: Fig. 7

Lateral Barb Guards for Three-Pronged Salmon Spears. (Figs. 86, d-e). These two specimens, both from Subcomponent VIIA, are fragments of cylindrical, bipronged objects such as those illustrated by Swanson (1958-9; 1962a). Each would have been about 8.0 cm. in length and 3.4 cm. in diameter, with the flat, blade-like prongs accounting for about 5.0 cm. of the total length. [213]

Hafted specimens from Fish Hook Island on the Lower Snake River indicate that these and other specimens of similar construction from elsewhere in the Plateau are guards for the lateral barbs of three-pronged salmon spears (Daugherty and Combes 1962: personal communication).

Comparable specimens.

Crabtree 1957: Pl. XXII, i; XXIII, e
Osborne, Bryan, and Crabtree 1961: Pl. 52b, 41
Swanson 1958-59: Fig. 1, b
Swanson 1962a: Fig. 32, a

Projectile Points (?) Although the function of the 18 specimens in this group has not been ascertained with complete certainty, there are at least some good ethnographic indications that projectile points of this general sort were used for hunting deer (Ray 1942:150-51). In addition, Swanson (1959:169) recovered such a point imbedded in the skull of a mountain sheep which was found in midden beneath house pits at the Schaake Village, near Vantage, Washington.

Distribution.

| Subcomponent | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| VII          | 2 | 1 | 1 | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| VI           | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| V            | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| IV           | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| III          | 0 | 0 | 0 | 0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| II           | 0 | 0 | 0 | 0 | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| I            | 0 | 0 | 0 | 0 | 0  | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Undesignated |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

Type 1 Slender, Basally Thinned projectile Points (Fig. 85, a-f)

Number of specimens. 10.

Material. Eight are of bone and two are of antler.

Measurements and description. The specimens in this type are long and slender, having slightly convex to straight edges and sharply pointed tips. Each is basally thinned, though the amount of thinning varies greatly from one specimen to the next. All are highly finished.

The following measurements are based on four specimens.

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Length</th>
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<tr>
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<td>7.35-10.7</td>
<td>0.6-0.8</td>
<td>0.3-0.5</td>
</tr>
<tr>
<td>Modes</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>
Technique of manufacture. These specimens were probably made on blanks blocked out of bone or antler with a chipped stone knife or graver. Grinding and polishing were then used to shape the blanks. [214]

Comments. It appears that projectile points of this type either developed from or replaced biconical antler points (Style 1), probably during the Cayuse I Subphase. However, because of the limited sample at hand, this observation must be taken as an hypothesis rather than a conclusion.

Distribution.

Style 1 Biconical Antler Points  (Figs. 14, p; 16, b)
Number of specimens. 4.
Material. Antler.
Measurements and description. These specimens, which are all fragmentary, would have resembled the barb or composite harpoon tip illustrated in Figure 85, i, the main difference between the two categories being one of size. The four points in this group would probably have ranged from 8.0 to 10.0 cm. to length and 0.7 to 1.0 cm. in diameter. They are characterized by circular cross sections; long, slightly tapering shanks; and short, pointed tips. The specimen from Cultural Component V is very fragmentary and therefore somewhat suspect. It is, however, definitely part of an antler point.

Technique of manufacture. Presumably these specimens were blocked out by means of cutting with a chipped stone knife or graver and then finished by grinding and polishing.

Comments. See bone and antler projectile points, Type 1.

Distribution. Comparable specimens. None.

Style 2 Bipointed Bone Projectile Point  (Fig. 85, h)
Number of specimens. 1.
Material. Bone. [215]
Measurements and description. This specimen is a long, slender, bipointed bone point with an ovate cross section. It measures 8.6 x 0.5 x 0.35 cm.

Technique of manufacture. This specimen was blocked out by means of cutting with a chipped stone knife or graver and finished by grinding and polishing.

Comments. None.

Distribution.

VII:  B, 2; G, 1; H, 1; I, 5; undesignated, 1
VI:  0
V:  0
IV:  0
III:  0
II:  0
I:  0

Comparable specimens.
Caldwell 1956: 143, Class IV: Pl. XI, 1
Collier et al., 1942: 77; Pl. VIII, e-.f
Crabtree 1957: Pl. XXII, e
Daugherty 1952: Fig. 114, 3-5
Osborne, Bryan, and Crabtree 1961: Pl. 52b, 37
Strong, Schenck, and Steward 1930: 58; Pl. 7, n, r
Shiner 1961: Pl. 39a, e
Comparable specimens.

Caldwell 1956: 143, Class IA; Pl. IX, k
Smith 1910: 27; 28, Fig. 9
Strong, Schenck, and Steward 1930: 58, Pl. 7, n, r

**Style 3 Bilaterally Barbed Antler Projectile Points** (Fig. 85, t-u)

*Number of specimens.* 2.

*Material.* Antler.

*Measurements and description.* The specimens in this group are bilaterally barbed antler points whose stems, or shanks, have been basally thinned. The edges of the body are slightly recurved, the barbs pointed. These specimens measure 6.2 x 1.1 x 0.3 cm., and 3.5 x 0.8 x 0.3 cm.

*Technique of manufacture.* These specimens were probably blocked out by cutting, then finished by grinding and whittling with a stone knife.

*Comments.* None.

*Distribution.*

<table>
<thead>
<tr>
<th></th>
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Comparable specimens.

Caldwell 1956: 157, Class 8; Pl. XIX, e
Strong, Schenck, and Steward 1930: 60; Pl. 6, f

**Form 1 Cylindrical Bone Point** (Fig. 85, g)

*Number of specimens.* 1. [216]

*Material.* Bone.

*Measurements and description.* This specimen is a tapering cylinder of bone with straight edges and a circular cross section. It measures *7.3 x 0.6 x 0.6 cm., the tip having been broken away.

*Technique of manufacture.* This specimen was presumably blocked out by cutting with a stone knife or graver and then finished by grinding and polishing.

*Comments.* None.

*Distribution.*

<table>
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</table>

Comparable specimens. None.

**Hafts.** Three hafts, all of antler, were recovered, though objects which may have been hafted in them were never found.

**Type 1 Antler Beam Adze Hafts** (Fig. 86, b)

*Number of specimens.* 2.

*Material.* Antler.
Measurements and description. Each of these specimens consists of the beam section of an antler, carefully adzed and shaved to remove irregularities. Only one is complete, measuring 10.5 x 2.9 x 2.2 cm. There is a socket in one end which is 2.9 cm. in depth.

Technique of manufacture. Adzing and shaving.

Comments. None.

Distribution.

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<tbody>
<tr>
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<td>II</td>
<td>0</td>
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<tr>
<td>I</td>
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</tbody>
</table>

Comparable specimens.

Carlson 1960: 568, Fig. 4A, r
Collier et al., 1942: 83 Antler Knife Handle
Garner 1960: 6-7
Smith 1900: 415, Fig. 348
Smith 1903: 164, Fig. 29, d-e
Smith 1907: Fig. 129; 314, Fig. 107
Teit 1900: 184, Fig. 125
Teit 1906: 204, Fig. 66 [217]

Form 1 Antler Tine Haft  (Fig. 86, c)

Number of specimens. 1.

Material. Antler.

Measurements and description. This specimen consists of a tip of an antler tine, into the adzed end of which a conical hole 1.5 cm. deep has been drilled. In addition, a V-shaped longitudinal groove has been cut into the inner edge of the tine. This specimen measures 7.0 x 2.0 x 1.9 cm.

Technique of manufacture. Adzing, drilling and cutting.

Comments. None.

Distribution. Comparable specimens. Teit 1906: 204, Fig. 67

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<td>I</td>
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</table>

Digging Stick Handles  (Figs. 86, a; 87) Two antler digging stick handles were recovered. One (Fig. 86, a) antedates Subcomponent VIIIG and is unusual only in that the tip of the tine is transversely grooved. The overall dimensions are 18.5 x 3.1 x 2.6 cm. The other specimen, from the floor of Subcomponent VIIIB, measures 24.0 x 3.4 x 2.4 cm. It has been elaborately decorated with incised designs and may be seen in Figure 87.

The design which appears on the larger specimen may be divided into the following elements: (1) circular lines used to divide the digging stick handle into segments and to border the major areas covered by the design; (2) design-filled zigzags formed by closely spaced parallel lines; (3) triangles, sometimes filled, which serve to terminate the zigzags; and (4) the use of lateral hatching as embellishment. The distribution of these elements in the Northwest is especially interesting. Fine lateral hatching used to embellish elements in straight-line geometrical design appears to be particularly common in the Salishan Plateau and neighboring costal area. From the Pot Holes, a site across the Columbia River from 45KT28, Crabtree (1957: Plate XXVII. a, f, design type 3) reports its use on Dentalia beads. He also illustrates an incised antler object (Plate XXVI, b) in which it is used as a bordering element to the same way it is used on the digging stick handle from Subcomponent VIIIB. Farther north Collier, Hudson, and Ford (1942: Fig. 14, a) recovered the fragment of a digging stick handle on which this motif was used as a longitudinal bordering element. This specimen came from their site 46, about four miles south of the Canadian border. As both this site and the Pot Holes represent the very late prehistoric and early historic, the lateral hatch is a design element which must have been in common use along the Upper Columbia during the entire Cayuse Phase.
Between the Canadian border and Lake Kamloops, some 110 miles to the north, there is a general hiatus of archaeological data. At Kamloops, however, the design again occurs as an element of decoration on a pipe bowl (Smith 1913:429). Moving into the Thompson-Fraser region, we see that Smith has reported three artifacts in which the lateral hatch is used (1899: Figs. 21 and 110; 1913: Plate XIV, i). He also reports (1899: 156-57) that some Thompson Indians of whom he inquired thought that this design might represent the wood-worm.

There is also some evidence which suggests that the lateral hatch motif occasionally was used to decorate barbed bone points in the area of the Fraser River delta (Smith 1903) and on Puget Sound (Smith 1907: Fig. 141, b). Other examples are comparatively rare. Heflin (1961) illustrates a tubular pipe from the Willamette Valley of Oregon on which there are incised bands of design-filled triangles identical to those which appear on the digging stick handle from Subcomponent VIIIB.

In addition there are two specimens from Wakemap Mound, one zoomorphic and the anthropomorphic, which contain this decorative element in the form of minor embellishments. The anthropomorphic figure has many counterparts recovered from the area of The Dalles, but to my knowledge no other is so decorated. This it should be noted, represents an extremely small percentage of the vast number of decorated objects taken from The Dalles locale and the entire Middle Columbia.

It is an intriguing fact that the lateral hatch and the various motifs with which it was combined have a distribution which coincides rather closely with the ethnographic distribution of Salishan speaking peoples. No specimens have been reported from Sahaptin areas, and the two specimens reported from Wakemap Mound, a site which is probably Chinookan, have used the design in a different manner.

**Distribution.**

<table>
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<td>I: 0 (bone not preserved)</td>
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</tbody>
</table>

**Comparable specimens.**

Collier et al., 1942: 82-84
Mallory 1962: 49, Item 4
Osborne 1957: 84-85

**Spatulate Scrapers** (Fig. 88, a-d). The artifacts included in this category have in common a narrow, rectangular outline, and one or two thin scraping edges which reveal signs of abrasion. There are six in all, two of rib bones, two utilized splinters of mammal long bone, one section of scapula, and a bar of antler. The rib bones, one of which comes from Subcomponent VIIIF and the other from an undesignated portion of Cultural Component VII, have each been heavily utilized along their caudal edges. They measure 18.25 x 1.6 x 0.7 cm., and 20.3 x 3.25 x 0.5 cm.

The use of deer and elk ribs in the scraping of hides prior to their curing is widely reported for Plateau groups (Ray 1942: 125; Spier and Sapir 1930: 200).

The split pieces of mammal bone, one from Cultural Component VI and the other from Subcomponent VIIIB, have been intensively utilized along the naturally sharp edges of fracture. They measure 13.4 x 2.0 x 1.0 cm. and 10.1 x 1.75 x 0.3 cm. Such implements have been ethnographically reported both for the preparation of skins prior to tanning (Ray 1942:125) and in the manufacture of arrows and bows (Ray 1932:88).

The piece of cut scapula (Fig. 88, d) derives from Subcomponent VIIIA and measures *9.9 x 1.9 x 0.3 cm. It consists of a portion of palm which has been cut out with a stone knife and has the outline of a knife blade. Its convex edge has been utilized, and it is inferred that its function is similar to that of the other specimens in this group.

The remaining specimen is a long, rectangular antler bar (Fig. 88, b) one edge of which appears to have been utilized, probably in scraping soft materials such as skins. Fragmentary, it measures *17.1 x 2.2 x 0.3 cm., and derives from Subcomponent VIIIG. [219]

**Distribution.**

<table>
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<td>I: 0 (bone not preserved)</td>
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</table>

**Comparable specimens.** None.
**Fleshing Implements (?).** Two specimens were recovered which tentatively have been identified as fleshing Implements similar to the specimen recovered and illustrated by Osborne (1957:86; Pl. 8b, 15). One, from Cultural Component VII, is the fragment of a specimen which would have duplicated the one illustrated by Osborne. Complete it would have consisted of a longitudinally dissected deer cannon bone, the proximal end of which had been ground into a convex fleshing bit. The other specimen (Fig. 88, e), which measures 14.8 x 1.7 x 0.8 cm. and derives from Subcomponent VIIA, is simply a split piece of long bone which has been furnished with a similar bit.

**Distribution.**

<table>
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<th>C</th>
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</table>

**Splinter Scrapers or Fleshers** These specimens, of which there are five, are long and narrow, having an outline like the bone flakers illustrated in Figure 89 (a-b). They are bluntly pointed and show polish and flaking due to utilization along edges adjacent to their tips.

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<td>Modes</td>
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**Splinter Scrapers or Fleshers**

<table>
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**Pressure Flaking Tools Used in the Manufacture of Clipped Stone Artifacts** (Fig. 89). A total of 58 bone and antler flaking implements were recovered, all, interestingly enough, from Cultural Component VII. Despite a thriving flaking industry in each of the earlier components and the presence of unworked antler tines in Cultural Component VI, no flaking implement was recovered from any of the earlier components. This may in part reflect relative sample sizes, but probably is related also to a greater reliance on percussion flaking prior to the Cayuse Phase. [220]

**Distribution.**

<table>
<thead>
<tr>
<th>Component</th>
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<th>C</th>
<th>D</th>
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</table>

**Type 1 Antler Tine Flakers** (Fig. 89, g-j)

**Number of specimens.** 46.

**Material.** Antler tines.

**Measurements and description.** These specimens consist of antler tines the tips of which have been modified through utilization.

<table>
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<tbody>
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<tr>
<td>Modes</td>
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</tbody>
</table>

**Technique of manufacture.** Normally a tine amply is adzed from the antler and utilized. One specimen (Fig. 89, i) was dissected longitudinally first by means of cutting with a chipped stone knife or graver.

**Comments.** None.

**Distribution.**

<table>
<thead>
<tr>
<th>Component</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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VI: 0
V: 0
IV: 0
III: 0
II: 0 (bone not preserved)
I: 0 (bone not preserved)

Comparable specimens.
Caldwell 1956: 165
Cressman 1960: 41; Fig. 37a
Crabtree 1957: pl. XXII, e, h
Osborne, 1957: 83; Pl. 12, b; 23, a
Osborne, Crabtree, and Bryan 1952: 361
Osborne and Shiner 1950: Pl. VIIIb, 70

Style 1 Rectangular Bar Flakers (Fig. 89, e-f)

Number of specimens. 7.
Material. Antler. [221]

Measurements and description. These specimens are long and narrow with a rectangular outline and cross section. One end has been shaped into a blunt bit used in pressure flaking. The other end is rounded off. Only two of these specimens are complete, measuring 6.8 x 0.7 x 0.5 cm., and 4.8 x 0.35 x 0.35 cm. The largest of the fragments measures *8.8 x 1.2 x 0.7 cm.

Technique of manufacture. These specimens were blocked out by means of a stone knife or graver and finished by shaving or whittling with a stone scraper or knife.

Comments. None.
Distribution. Comparable specimens. None.

Form 1 Split Long Bone Flakers (Fig. 89, a-b)

Number of specimens. 2.
Material. Mammal long bone.

Measurements and description. These specimens consist of long, narrow splinters of long bone which have been pointed at one end and utilized in flaking. They measure 9.8 x 1.5 x 0.8 cm., and 8.8 x 1.2 x 0.7 cm.

Technique of manufacture. A suitable splinter of bone was selected and one end ground to a blunt point. Utilization followed.

Comments. None.
Distribution. Comparable specimens. Butler 1962a: Fig. 15, b

Form 2 Shaved Antler Beam Flaker

Number of specimens. 1.
Material. Antler.

Measurements and description. This specimen consists of the proximal end of an antler which has been diagonally shaved to a blunt point and then utilized as a flaker. It measures 15.3 x 4.5 x 4.0 cm. [222]
Technique of manufacture. Adzing and shaving.

Comments. None.

Distribution. Comparable specimens. None.

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<tr>
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<th>VI:</th>
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</table>

Form 3 Polished Bone Flakers (Fig. 89, c-d)

Number of specimens. 2.

Material. Bone.

Measurements and description. One of these specimens (Fig. 89, c), coming from Subcomponent VIIIE, is the penis bone of a bear which has been polished, sharpened, and used as a flaking implement. It measures 9.3 x 0.9 x 0.8 cm.

The other specimen (Fig. 89, d), deriving from Subcomponent VIIH, is a large splinter of long bone which has been ground into a roughly tapering cylinder, the narrow end of which is pointed, the wide end having been rounded. This specimen measures 8.5 x 1.2 x 0.9 cm., and, like its companion, displays clear signs of being utilized as a flaker.

Technique of manufacture. Grinding and polishing.

Comments. None.

Distribution. Comparable specimens. None.

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</table>

Antler Splitting Wedges (Fig. 90, b-e). Unilaterally beveled antler splitting wedges were common throughout the Plateau during the ethnographic period (Ray 1942:145). In addition there is some indication that they may have had a secondary use in dehairing and scraping hides in the skin-dressing process (Spier and Sapir 1930:200; Ray 1942:125).

Type 1 Unilaterally Beveled Antler Splitting Wedges (Fig. 90, b-e)

Number of specimens. 22.

Material. Antler. [223]

Measurements and description. These specimens, manufactured from the beam sections of antlers, have been diagonally cut to form a unilaterally beveled bit. Splinters knocked from their striking platforms and blunted bits demonstrate that these specimens have all been used as splitting wedges. The following measurements are based on six complete specimens.

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<td>3.3-3.6</td>
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</table>

Technique of manufacture. Beam sections were removed and beveled by adzing and shaving. The finished product was then produced by grinding.

Comments. None.

Distribution.

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<th></th>
<th>VII:</th>
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<th>IV:</th>
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</table>
Comparable specimens.

Caldwell 1956: 162, P1. XX, a-b
Collier et al., 1942: 86. PL VII, c-e
Cressman 1960: 42, Type b; Fig. 38a, B, D, F
Osborne 1957: 85-86
Smith 1899: 141
Smith 1900: Fig. 345
Smith 1910: Fig. 39
Strong, Schenck, and Steward 1930:70; Pl. 10, a-c, e
Teit 1900: Fig. 119

Bone Chisel (Fig. 89, a). This specimen, deriving from Cultural Component VII, is long and very narrow, having a bilaterally ground bit and a striking platform from which several splinters have been detached. The bit has been ground to a very fine, sharp edge. This specimen measures 10.0 x 0.9 x 0.8 cm.

Distribution.

VII: undesigned, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0 (bone not preserved)
I: 0 (bone not preserved)

Beaver Tooth Chisels or Engravers (Fig. 91, b-c). Hafted beaver tooth engravers have been widely reported for Plateau groups (Ray 1942:147). In addition, hafted specimens have been reported by Duff (1956:67-72) and Smith (1899:145, Fig. 53).

Type 1 Beaver Tooth Engravers. (Fig. 91, b-c) [224]

Number of specimens. 5.

Material. Beaver teeth.

Measurements and description. These specimens consist of unsplit or longitudinally split incisors, the biting edge of which has been sharpened through grinding.

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Technique of manufacture. Grinding.

Comments. A hafted beaver tooth engraver was recovered from Fish Hook Island on the lower course of the Snake River (Daugherty and Combes 1963: personal communication).

Distribution.

VII: A. 1; H, 1; L, 1; undesigned, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0 (bone not preserved)
I: 0 (bone not preserved)
und.: 1 (recovered from beach)

Comparable specimens.

Duff 1956: 66-72
Smith 1899: Fig. 49

Worked Canine Tooth (Fig. 91, a). A single, apparently worked or utilized canine tooth from a carnivore was recovered from Cultural Component VII. A portion of biting surface has been flaked away and the tooth worn slightly along the broken surface. This specimen, whose function is not known, measures 4.1 x 1.0 x 0.9 cm.

Small Bone Hammer ? (Fig. 92, a). This specimen which derives from Subcomponent VIIC, is rather unique. It is trough-shaped, being a piece of longitudinally split long bone, and one end has been severely battered. This is made very clear by a bone flake which was found in association with the hammer. The flake matches one of the largest flake scars which extends longitudinally back from the striking platform, but when fitted into place extends 0.5 cm beyond that platform, clearly demonstrating the extensive use to which the specimen has been put. This specimen measures 7.7 x 2.1 x
Percussion Flaked Bar of Bone (Fig. 92, b). This specimen, which comes from Cultural Component VII, is a rectangular piece of long bone which has been shaped by means of percussion flaking. One end possesses a chisel-like bit and is probably connected in some way with this object's use. This specimen measures 7.0 x 1.7 x 0.6 cm.

Gambling Bones (Fig. 93, a-f). Sixteen gambling bones were recovered from Cultural Component VII. Of these, 13 were found on two house floors, and two were in association with one another in Subcomponent VIIA. Thus the sample is somewhat more selective than its size actually indicates.

These specimens were probably used in the dice game or the stick game, forms of entertainment widely distributed in the Plateau (Ray 1942:183-84). [225]

Type I Gambling Bone Decorated with Opposable Triangles (Fig. 93, f)

Number of specimens. 1.

Material, Antler.

Measurements and description. Specimens of this type have slightly excurvate edges, squared off ends, and are oval in cross section. The design appeals on one side only and, though it may be embellished with a variety of supplementary decorations, basically consists of a transverse bisecting line or rectangle to either side of which is set an isosceles triangle. The specimen from 45KT28, which measures 5.7 x 1.2 x 0.6 cm., is decorated with an extremely simple version of this motif.

Technique of manufacture. This type is most common in the Dalles locale, where it is believed to have been used between 1600 and 1800 A.D. Specimens from the Upper Columbia region are rare, thus far having been found in very late prehistoric and historic sites. In this area other types of gaming pieces are far more common, a fact suggesting that Type 1 gambling bones were imported from the area of The Dalles in late Cayuse III times, probably between 1700 and 1800 A.D.

Distribution.

VII: I, 1
VI: 0
V: 0
IV: 0
III: 0
II: 0 (antler not preserved)
I: 0 (antler not preserved)

Comparable specimens.

Butler 1958-59: 68, Fig. 1, b-c
Crabtree 1957: 84; Pl. XXIII, b
Strong 1959: Fig. 90
Strong, Schenck, and Steward 1930: 59; Pl. 6, o

Style 1 Gambling Bones Decorated with Transverse Lines (Fig. 93, b-e)

Number of specimens. 12.

Material. Five are of broad mammal rib, and seven are of long bone splinters. Specimens made of each material were present in both the subcomponents from which this style was recovered.

Measurements and description. Each specimen made of rib bone has been altered only through decoration, which consists of numerous transverse scratches that cluster together to form four to eight ill-defined lines per specimen. The bone specimens retain the outline of the splinters from which they were manufactured and are decorated with incised, transverse lines or grooves. The number of these per specimen varies from 5 to 10, and in some cases they are arranged in pairs. In one specimen (Fig. 93, e) the lines have been replaced by rows of dots.

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Technique of manufacture. Grinding and incising. [226]

Comments. A number of specimens of this style were found by a collector in a house pit across the river from 45KT28.

Distribution. Comparable specimens. None.

VII: H, 5; I, 7
Style 2 Gambling Bones Decorated with Open Zigzags

Number of specimens. 1.

Material. Mammal rib.

Measurements and description. This specimen was well formed, having slightly excurvate edges and rounded extremities. One surface is decorated with opposing sets of diagonal lines or open zigzags. Unfortunately this specimen is fragmentary. Whole it would have measured 6.5 x 1.3 x 0.5 cm.

Technique of manufacture. Grinding and incising.

Comments. None.

Distribution. Comparable specimens. Osborne, Crabtree, and Bryan 1952: 363, Pl 110, a

Form 1 Undecorated Gambling Bones (Fig. 93, a)

Number of specimens. 2.

Material. Bone.

Measurements and description. These specimens are long and narrow with rounded ends and subrectangular cross sections. They are well made, measuring 8.2 x 1.3 x 0.5 cm., and 7.8 x 1.3 x 0.5 cm.

Technique of manufacture. Grinding and polishing.

Comments. These specimens were found in direct association with one another. [227]

Distribution.

Comparable specimens.

Beads and Pendants. There are 33 specimens in this category, of which three are antler. Two decorated specimens, it should be noted, were recovered from Cultural Component V and thus derive from the late Frenchman Springs Phase. Though too fragmentary to be assigned a specific function, they demonstrate that decoration through design incising probably was established prior to 1000 B.C.
Type 1 Tubular Bird Bone Beads (Fig. 93, j-l)

Number of specimens. 12.


Measurements and description. As the specimens illustrated in Figure 93 suggest, these beads vary in diameter and length. Eight long, narrow beads were recovered (Fig. 93, k). These ranged in length from 4.3 to 3.9 cm., in width from 0.4 to 0.3 cm., and in thickness from 0.35 to 0.2 cm. Two of the remaining four specimens were short and of comparatively large diameter (Fig. 93, j). These measure 1.1 x 1.4 x 1.2 cm., and 1.4 x 1.55 x 1.25 cm. The remaining specimens (Fig. 93, l) are of intermediate dimensions, measuring 2.1 x 0.7 x 0.6 cm., and 3.0 x 0.9 x 0.8 cm. One of these, from Subcomponent VII C, has shallowly serrated rims.

Technique of manufacture. Sections of bird bone were cut and broken into the desired lengths. They were then finished by grinding and polishing.

Comments. None.

Distribution.

VII: C, 1; G, 1; I, 5; undesignated, 5
VI: 0
V: 0
IV: 0
III: 0
II: 0 (bone not preserved)
I: 0 (bone not preserved) [228]

The undesignated specimens all appear to be from the upper portions of Cultural Component VII, and probably represent Cayuse II and III materials.

Comparable specimens.
Collier et al., 1942: 88; Pl. X, k
Osborne 1957: 88; Pl. 23a; 28

Style 1 Elongate Rib Pendants (Fig. 93, g-i)

Number of specimens. 13.

Material. The ribs of large mammals.

Measurements and description. These specimens are long, thin, flat sections of rib perforated at one end and bluntly pointed at the other. Though usually smooth, the edges of two specimens were serrated (Fig. 93, i). Presumably because of their delicacy, all of the specimens in this group are fragmentary. Fragments vary in thickness from 0.2 to 0.3 cm. and in width from 0.8 to 1.7 cm., the mode being 1.0 cm. The longest fragment measures 8.65 cm.; maximum length probably did not exceed 10.0 or 11.0 cm.

Technique of manufacture. Grinding, polishing, and perforating.

Comments. All but the two perforated bases and a few of the larger fragments were recovered from the level bags. Many of the fragments were quite small, and, due to their shape and the type of bone from which they were made, quite easy to bypass in the field. It is likely, then, that they have occurred at many excavated sites in the Plateau, but were either missed in the field or languish in as yet unopened level bags.

Distribution. Comparable specimens. None.

VII: B, 2; H, 1; undesignated, 10
VI: 0
V: 0
IV: 0
III: 0
II: 0 (bone not preserved)
I: 0 (bone not preserved)

The 10 undesignated specimens were distributed throughout Cultural Component VII.

Form 1 Large Bird Bone Beads or Drinking Tubes

Number of specimens. 2.


Measurements and description. These specimens are long, slender tubes with highly polished exteriors. Both are
fragmentary. Complete they would have measured approximately 8.0 cm. in length and 1.4 cm. in diameter.

Technique of manufacture. The ends of long bird bones were detached by cutting and breaking. The ends and exteriors of the remaining shafts were then polished.

Comments. These specimens may also be the fragments of shaman's sucking tubes. [229]

Distribution. Comparable specimens. None.

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Form 2 Rectangular Antler Bead (Fig. 93, n)

Number of specimens. 1.

Material. Antler.

Measurements and description. This specimen was manufactured from a fragment of what must have been a thick-walled tubular object, probably a bead. Through simple redrilling it was converted into a rectangular bead measuring 2.6 x 1.5 x 0.7 cm.

Technique of manufacture. See above, Measurements and description.

Comments. None.

Distribution. Comparable specimens. None.

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Form 3 Triangular Antler Pendant (Fig. 93, o)

Number of specimens. 1.

Material. Antler.

Measurements and description. This specimen is shaped roughly like an isosceles triangle whose apex has been pulled into a small knob. It is decorated with diagonal lines on the obverse and closely spaced transverse lines around its perimeter. It measures 3.9 x 1.7 x 0.7 cm.

Technique of manufacture. Grinding and incising.

Comments. None.

Distribution. Comparable specimens. None.

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This specimen antedates Subcomponent VIIH.

Form 4 Incised Antler Bar (Fig. 93, m)

Number of specimens. 1.

Material. Antler.

Measurements and description. This specimen is a central fragment of a thin, broad, slightly curved antler bar whose obverse side has been diagonally incised with a number of deep grooves. The bar is broken at each end along such
grooves. It measures *3.5 x 2.2 x 0.2 cm.

*Technique of manufacture.* Cutting and grinding.

*Comments.* None.

*Distribution.*

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</table>

*Comparative specimens.* None.

### Fragments of Incised Bone Objects

*Number of specimens.* 3.

*Material.* Bone.

*Measurements and description.* Original forms cannot be reconstructed for any of these specimens. The fragment from Subcomponent VIH came from a flat object in the obverse side of which many dots have been drilled. One of the specimens from Cultural Component V is from the edge of an object which was incised with diagonal lines. The other was evidently a flat object, at least one surface of which was more elaborately decorated. The surviving fragment is incised with a zigzag line which is interspaced with dots.

*Technique of manufacture.* Grinding, incising, and polishing.

*Comments.* None.

*Distribution.*

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</table>

*Comparative specimens.* None.

### Antler Comb (Fig. 95).

A rectangular antler comb was recovered from Cultural Component VII. Its body measures 5.5 x 3.0 x 0.5 cm., and along one of the longer edges there are the remains of 10 teeth which would have averaged approximately 2.5 cm. in length, bringing the over-all measurements to 5.5 x 5.5 x 0.5 cm. Along the other edge there is a row of 12 knob-like projections which may be the reworked remains of another row of teeth. The body of this specimen has been decorated by three rows of double stippling, and the teeth have been embellished with shallow serrations.

The stipple design has been reported on an antler haft recovered from Whalen II, a site located in southwestern British Columbia (Duff 1956: Pl. 1, a). Rectangular antler combs appear to be quite rare in the archaeological record, comparable specimens being reported by Huntzinger (1962) and Smith (1899:150, Fig. 83). This fact agrees well with ethnographic information, which indicates that the most common type was a compound wooden comb (Ray 1942: 170).

### Fragments of Projectile Points, Composite Harpoon Tips, and Barbs from Three-Pronged Salmon Harpoons.

The specimens in this group are fragmentary and cannot be more accurately identified.

*Distribution.*

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*Comparative specimens.* None.

### Fragments of Points, Composite Harpoon Tips, Three-Pronged Salmon Harpoon Spears, Awls, and Needles, Bone Flakers, and Other Pointed Objects.

There are 28 specimens in this group, the possible functions of which are listed above. Unfortunately, more positive identification is not possible.

*Distribution.*
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**Fragmentary Antler Artifacts.** The 23 specimens in this category represent a wide variety of forms, although specific identification is in each case impossible.

**Distribution.**

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**Fragmentary Bone Artifacts.** The 47 specimens in this category represent a wide variety of forms, although specific identification is in each case impossible. [232]

**Distribution.**

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**Cut Bone Detritus** (Fig. 96, a-d). The 25 specimens in this category are, variously, blanks prepared for the manufacture of such artifacts as bone points and awls, and trimmings discarded in the manufacture of such blanks.

**Distribution.**

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</table>

**Cut Antler, Detritus from the Manufacture of Artifacts.** The five specimens in this group are detritus from the manufacture of antler artifacts such as composite harpoon valves and tips, projectile points, and flaking implements.

**Distribution.**

<table>
<thead>
<tr>
<th>Level</th>
<th>A</th>
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</table>

**Adzed Antler Beams, Detritus from the Manufacture of Artifacts** (Fig. 96, e-f). Nine adzed sections of antler beams were recovered and are presumably detritus from the manufacture of artifacts. They are similar to the specimens illustrated by Cressman (1960:86, Figs. 39a, A-F; 39b, A-B).

**Distribution.**

<table>
<thead>
<tr>
<th>Level</th>
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</table>
**Shell Artifacts of aboriginal Trade**

The 34 specimens in this category represent at least six marine species whose distributions indicate that this area of the Plateau was tied to prehistoric trade routes reaching at least as far south as Monterey, California, and as far north as southern British Columbia. [333]

**Distribution.**

- VII: B, 2; C, 4; D, 1; G, 2; H, 9; I, 5; undesignated, 10
- VI: 0
- V: 0
- IV: 0
- III: 0
- II: 0 (shell not preserved)
- I: 0 (shell not preserved)
- und.: 1 (beach slough)

**Shell Ornaments** (Figs. 97, d, f-h; 98). Of the 34 shell specimens of aboriginal trade, 32 are ornaments or material for the manufacture of ornaments.

**Distribution.**

- VII: B, 2; C, 4; D, 1; G, 1; H, 9; I, 5; undesignated, 9
- VI: 0
- V: 0
- IV: 0
- III: 0
- II: 0 (shell not preserved)
- I: 0 (shell not preserved)
- und.: 1 (beach slough)

**Type 1 Dentalium Beads** (Fig. 97, h)

**Number of specimens.** 26.

**Material.** Dentalia.

**Measurements and description.** The Dentalium shell is a small, cylindrical "tusk." At 45KT28 cut sections of shells were found as well as whole and fragmentary examples. The longest complete specimen was 4.5 cm. in length. Cut sections varied a great deal in length, some being as short as 0.5 cm.

**Technique of manufacture.** The ends of Dentalia were ground off or short sections cut from larger shells.

**Comments.** From the ethnographic record it is known that Dentalia were commonly used by many Plateau groups for ornamentation and as an informal medium of exchange (Ray 1942: 171,190).

**Distribution.**

- VII: B, 1; C, 4; D, 1; G, 1; H, 6; I, 5; undesignated, 8
- VI: 0
- V: 0 (preservation questionable)
- IV: 0 (preservation questionable)
- III: 0 (preservation questionable)
- II: 0 (shell not preserved)
- I: 0 (shell not preserved)

The eight undesignated specimens span the entire component, two possibly being associated with Subcomponent VIIA. [234]

**Comparable specimens.**

- Collier et al., 1942: 93
- Crabtree 1957: Pl. XXVIII
- Mallory 1962: 46, 50, 51, 64-65
- Mills and Osborne 1952: 356
- Osborne 1957: 108
- Osborne 1959: 104
- Osborne, Crabtree, and Bryan 1952: 367-68
- Strong, Schenck, and Steward 1930: 72; Pl. 11, m-n
**Type 2 Olivella Shell Bead** (Fig. 97, f)

**Number of specimens.** 1.

**Material.** *Olivella biplicata*, Sowerby.

**Measurements and description.** This specimen is a tightly coiled gastropod, the topmost whorls of which have been ground off. It measures 2.2 x 1.2 x 1.2 cm.

**Technique of manufacture.** Grinding.

**Comments.** None.

**Distribution.**

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This specimen postdates Subcomponent VIIIE.

**Comparable specimens.**

Collier et al., 1942: 94; Pl. XI, k-m  
Fryxell and Daugherty 1962: 26  
Osborne 1957: 108  
Osborne, Crabtree, and Bryan 1952: 367  
Gunkel 1961: 220, Style 1  
Smith 1899: 153  
Smith 1910: 96; Fig. 87  
Smith 1913: 31  
Strong, Schenck, and Steward 1930: 72  
Weld and Weld 1962: 16

**Form 1 Abalone Gorget or Nose Pendant** (Fig. 98)

**Number of specimens.** 1.

**Material.** Blue abalone (*Haliotis fulgens*, Philippi). [235]

**Measurements and description.** This specimen, which is manufactured from a thin excurved piece of shell, takes the form of a broad, full crescent, biconically perforated near the tip of each horn. It measures 3.5 x 2.8 x 0.15 cm.

**Technique of manufacture.** Grinding, cutting, polishing, and perforating.

**Comments.** Since blue abalone occurs only from Monterey to Lower California (Morris 1952:79), there can be no doubt that the material for this ornament, if not the ornament itself, was traded over a great distance.

**Distribution.**

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**Comparable specimens.** None.

**Form 2 Scallop Shell Pendant Fragments** (Fig. 97, d)

**Number of specimens.** 2.

**Material.** Weathervane Scallop (*Patinopecten caurinus*, Gould).

**Measurements and description.** These specimens are small fragments of scallop shells which were once
presumably pendants, perhaps similar to those reported by Smith (1899:152, Figs. 92-93).

Technique of manufacture. These fragments show no signs of alteration.

Comments. The Weathervane Scallop occurs from Alaska to Humboldt Bay, California (Morris 1952:15-16).

Distribution. Comparable specimens. None.

VII: H, 2
VI: 0
V: 0 (preservation questionable)
IV: 0 (preservation questionable)
III: 0 (preservation questionable)
II: 0 (shell not preserved)
I: 0 (shell not preserved)

Form 3 Pendant Fragment (Fig. 97, g)

Number of specimens. 1.

Material. Either Butter Clam (Saxidomus giganteus, Deshayes) or Horse Clam (Schizothaerus nutallii capax, Gould).

Measurements and description. This specimen is a large fragment, presumably of a pendant of trapezoidal or hexagonal outline. The shell is thick and well worked, though a few traces of both the internal and external surface structure remain.

Technique of manufacture. Grinding and polishing.

Comments. Both the Butter Clam and the Horse Clam are abundant along the Washington coast. [236]

Distribution. Comparable specimens. None.

VII: B, 1
VI: 0
V: 0 (preservation questionable)
IV: 0 (preservation questionable)
III: 0 (preservation questionable)
II: 0 (shell not preserved)
I: 0 (shell not preserved)

Form 4 Horse Clam Fragment

Number of specimens. 1.

Material. Either Schizothaerus nutallii, Conrad, or its variety Schizothaerus nutallii capax, Gould, which is particularly common on the Washington coast.

Measurements and description. This specimen is the unaltered fragment of a Horse Clam.

Technique of manufacture. None.

Comments. The Horse Clam abounds in tidal waters from Alaska to California (Morris 1952:57).

Distribution. Comparable specimens. None.

VII: 0
VI: 0
V: 0 (preservation questionable)
IV: 0 (preservation questionable)
III: 0 (preservation questionable)
II: 0 (shell not preserved)
I: 0 (shell not preserved)
und.: 1 (beach slough)

Shell Artifacts of Utility (Fig. 97, e). The two specimens in this group represent an artifact type hitherto unreported east of the Cascade Mountains, though common enough along the coasts of Washington and British Columbia.

Type 1 Mussel Shell Adze or Scraper Fragments (Fig. 97, e)

Number of specimens. 2.

Material. California Mussel (Mytilus Califormicus, Conrad).

Measurements and description. These specimens are bit fragments of what once were implements like those
cited below. Presumably they took on the general outline of an adze, with a unifacially ground bit at one end. The specimens from 45KT28 are rather small fragments, but judging from their shallow arcs and the growth rings in the shell, they must have been made of sizable mussels.

**Technique of manufacture.** Grinding and polishing.

**Comments.** The California Mussel occurs from the Aleutians to Mexico (Morris 1952:20). However, artifacts of this type seem to be particularly well developed in the Straits of Georgia region of southern British Columbia. [237]

**Distribution.**
- VII: G, 1; undesignated, 1
- VI: 0
- V: 0 (preservation questionable)
- IV: 0 (preservation questionable)
- III: 0 (preservation questionable)
- II: 0 (shell not preserved)
- I: 0 (shell not preserved)

The undesignated specimen postdates Subcomponent VIIF.

**Comparable specimens.**
- Carlson 1960: 569, 575, 582
- King 1950: 59, Fig. 16
- Smith 1899: 140, Fig. 35
- Smith 1907: 341, Fig. 128, b

**Shell Ornaments of Local Manufacture**

**Ornaments.** As it happens, all shell artifacts of local manufacture are beads and pendants which were recovered from Cayuse III subcomponents.

The seven specimens in this category are made of fresh-water mussel shells which are locally available in the Columbia River and its tributaries.

**Distribution.**
- VII: H, 3; I, 4
- VI: 0
- V: 0 (preservation questionable)
- IV: 0 (preservation questionable)
- III: 0 (preservation questionable)
- II: 0 (shell not preserved)
- I: 0 (shell not preserved)

**Type 1 Disc Beads** (Fig. 97, c)

**Number of specimens.** 5.

**Material.** Fresh-water mussel shell.

**Measurements and description.** These are flat, circular discs, the centers of which have been biconically perforated. One lacks a perforation and is thought to be a bead blank. These specimens average 1.0 cm in diameter and 0.3 cm. in thickness.

**Technique of manufacture.** Grinding and perforating.

**Comments.** The use of disc beads both for decoration and as a medium of informal exchange was widespread in the Plateau during the ethnographic period (Ray 1942:172, 190). [238]

**Distribution.**
- VII: H, 3; I, 2
- VI: 0
- V: 0 (preservation questionable)
- IV: 0 (preservation questionable)
- III: 0 (preservation questionable)
- II: 0 (shell not preserved)
- I: 0 (shell not preserved)

**Comparable specimens.**
- Collier et al., 1942: 94, PL XI, k-m
Form 1  Circular Pendant (Fig. 97, b)

Number of specimens. 1.

Material. Fresh-water mussel shell.

Measurements and description. This is a thin, circular piece of mussel shell which has been perforated near its edge. It measures 1.7 x 1.6 x 0.15 cm.

Technique of manufacture. Grinding and perforating.

Comments. None.

Distribution.  Comparable specimens. None.

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<th>IV</th>
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Form 2  Decorative (?) Object (Fig. 97, a)

Number of specimens. 1.

Material. Fresh-water mussel shell.

Measurements and description. This is a rather unusual specimen, oval in outline and measuring 1.5 x 1.0 x 0.2 cm. Its obverse side is smooth and noticeably excurred. The reverse side is dished, or incurved, and the periphery is quite sharp. The perforation is large and oval, measuring 0.6 x 0.5 cm. At one end on the dished side, midway between the perforation and the periphery, there is a small carefully incised groove the function of which is not known.

Technique of manufacture. Grinding and incising.

Comments. None. [239]

Distribution.  Comparable specimens. None.

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<th></th>
<th>VII</th>
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Articles of Historic Trade

Four artifacts of western manufacture, all of metal, were recovered from the site. One is a hand-rolled, tubular copper bead which was found in slump debris along the beach. Another, found in the topmost portion of the fill of Subcomponent VIIH, is a Phoenix button 1.9 cm. in diameter (Fig. 99, b). The third specimen is a ten-point Iron rowel 5.0 cm, in diameter (Fig. 99, a). Like the fourth specimen, the rowel was recovered from the fill above Subcomponent VII-I. The last specimen is an iron lock plate (Fig. 100) either from a Northwest gun manufactured between 1860 and 1880 or from an English pattern rifle manufactured in America as early as 1828 (see Caldwell 1960a, 1960b).

Materials Utilization

Among the geological materials used for manufacture of implements in the Vantage locale, various forms of cryptocrystalline silica, basalt, and obsidian are most common. Significant differences in both distribution and function of these materials are outlined below.

Cryptocrystalline Silica. Cryptocrystalline silica may be found in abundance along the Columbia, particularly in the basalt flows which lie between Priest Rapids and Wenatchee (Mackin 1961). It constitutes the best flaking material available in the region and has been utilized in the manufacture of chipped stone artifacts nearly to the exclusion of such
rocks as basalt and obsidian. However, a striking exception to this generalization occurs during the Cold Springs Phase, one characteristic of which is a heavy reliance on the use of basalt even in those areas in which cryptocrystalline silica existed.

**Basalt.** Basalt, which comprises the bedrock throughout most of the Columbia Plateau, frequently was utilized in the manufacture of heavy stone artifacts. Fragments of talus were used to make spall scrapers and chopping and crushing tools. River cobbles, usually of basalt, were used to make choppers, scraping planes, crushing implements, pestles, hammerstones, hopper mortars, sinkers, anchors, and the like.

But basalt was used also in the manufacture of chipped stone artifacts during two distinct periods of prehistory. The first of these coincides with and is a characteristic of the Cold Springs Phase. At this time basalt is the material most frequently used in the flaking of projectile points, knives, and other chipped stone artifacts. The last vestige of this tradition may be seen in Cultural Component III at 45KT28 where a small percentage of the projectile points is still being manufactured out of basalt. The other period during which basalt was utilized in this fashion occurs in late prehistoric times during the Cayuse III Subphase. At this time it forms a very small percentage of the projectile point assemblage and probably reflects increased contacts and trade with that part of the Plateau which lies north of the Okanogan Highlands.

**Obsidian.** Obsidian has formed an item of trade ever since the altithermal, and possibly during earlier periods as well. During the Cold Springs, Frenchman Springs, and Quilomene Bar Phases it was traded northward from the northern Great Basin with regularity and probably in fairly sizable quantities. The major source areas were in central Oregon, about 200 miles to the south. During the Cayuse I and II Subphases this trade was considerably diminished though probably never completely curtailed. During the Cayuse III Subphase trade in obsidian became more important again, with source areas being not only in the northern Great Basin but probably also the deposits in Yellowstone National Park. [240]

The distribution of obsidian artifacts and flakes at 45KT28 is as follows.

<table>
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**Steatite.** That the use of this material was well established by late Altithennal or early Medithermal times to demonstrated deaflty by the two pieces of ground and drilled steatite from Cultural Components IV and V (Figs. 13, h; 14, o). However, none of this material was recovered from Cultural Component VI, and there was a surprisingly small amount of it in Cultural Component VII: one specimen from Subcomponent VIIA (Fig. 74, t) and three specimens from Subcomponent VlII (Fig. 74, o, s). Fortunately there is abundant comparative material representing this time period from many sites in the Plateau (see C. G. Nelson 1960).

**Quartz Crystal.** A single quartz crystal was recovered from Subcomponent VlII-I. It was not worked in any way and its function is unknown.

**Graphite.** The use and occurrence of graphite is discussed under the section devoted to stone beads and pendants.
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Table 1. Vertical distribution of stemmed projectile points. Decimal figures are percents of the total number of stemmed projectile points recovered per respective component or subcomponent. [240a]
Table 2. Vertical distribution of the type varieties in Type 6, the Columbia Plateau Corner Notched. Decimals represent percent of total number of Type 6 recovered per designated subcomponent. Note particularly the distribution of Type Varieties 6A and 6B in relationship to all the other type varieties combined.

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<th>Type 6C</th>
<th>Type 6D</th>
<th>Type 6E</th>
<th>Type 6F</th>
<th>Type 6G</th>
<th>Type 6H</th>
<th>Type 6I</th>
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<td>5</td>
<td>5.7</td>
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<td>17.2</td>
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</tr>
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<td>VII L</td>
<td>13</td>
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<td>38.5</td>
<td>1</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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</tr>
<tr>
<td>K</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
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<td>J</td>
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<td>11</td>
</tr>
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<td>H</td>
<td>54</td>
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<td>G</td>
<td>18</td>
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<td>3</td>
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<td>—</td>
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<td>19.0</td>
<td>6</td>
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<td>C</td>
<td>7</td>
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<td>—</td>
<td>—</td>
<td>1</td>
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<td>7.4</td>
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<td>18</td>
<td>22.2</td>
<td>2</td>
<td>2.5</td>
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Table 3. Vertical distribution of utilized flakes. Decimals refer to percent of total number of chipped stone artifacts per designated component or subcomponent.

<table>
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<tr>
<th>Component/Subcomponent</th>
<th>Purposefully struck flakes (Major dimension − cm)</th>
<th>Splinters or flake fragments</th>
<th>Utilized knife fragments</th>
<th>Totals</th>
<th>Percentage</th>
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<td>8 5 4 2</td>
<td>5 1 1</td>
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<td>21.2</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>— — —</td>
<td>— —</td>
<td>—</td>
<td></td>
<td></td>
</tr>
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<td>J</td>
<td>— — —</td>
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<tr>
<td>I</td>
<td>6 9 2 1</td>
<td>4 5 —</td>
<td>33</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>6 6 4 2</td>
<td>3 2 3</td>
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</tr>
<tr>
<td>G</td>
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<td>3 2 1</td>
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<tr>
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<td>15</td>
<td>11.8</td>
<td></td>
</tr>
<tr>
<td>C</td>
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<td>36 23 19</td>
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<tr>
<td>Totals</td>
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<td>35.4</td>
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<td>1 1 1</td>
<td>1</td>
<td>12.5</td>
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<td>31.1</td>
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<td>2 1 1</td>
<td>14</td>
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APPENDIX B. FIELD AND LABORATORY METHODOLOGY

Between the fall of 1957 and the spring of 1963, fourteen Washington Archaeological Society expeditions visited 4SKT28. Each consisted of a crew of from three to five individuals who spent from two to eight days working in the field. The nucleus of the crew always consisted of Mr. and Mrs. C. G. Nelson and their son, the author, who directed the excavations. Additional crew members were students, some of whom had had experience on professional digs in the Northwest.

Field Techniques. Although field techniques were in large measure dictated by the exigencies of salvage archaeology, the emphasis in excavation was always on stratigraphic control. And, as the excavations progressed, more and more attention was paid to sampling and sample sizes, with the specific intention of filling out as much of the archaeological record as possible. However, time and an exceedingly low budget prevented us from completely accomplishing this with respect to the earlier components, the samples from which are quite small in comparison to what they could have been if more work had been done at the site. For example, 199 artifacts were recovered from approximately 200 square feet of surface area of Cultural Component III, whose total surface area lies some place between 10,000 and 100,000 square feet. Even using the most conservative calculations this component was capable of yielding a fantastically large sample; fantastic because Cultural Component III is one of the earliest documented components along the Upper Columbia.

Perhaps the most serious field problem encountered was the periodicity of the excavations. Field expeditions were regularly sent into the field each spring and fall; the rest of the year the dig lay fallow. As a result, spring flooding, freezing and thawing, and other natural agents created annual havoc with trench walls and datum points. Both stratigraphic and empirical datum points were reestablished each time the site was visited.

The main excavation was centered in the area of House Pit 15, additional work being carried on at House Pits 5, 7, 10, 13, 28, and 29 (see Fig. 4). This work was greatly buttressed by a large collection of artifacts which Mr. and Mrs. Ted Weld had made from House Pit 12, and also by Mr. and Mrs. Walter Barke's excavation of a considerable portion of House Pit 1.

At House Pit 15 a grid of five-foot squares was laid out according to the center-line system, a rather cumbersome means of pit designation, but one which the author happened to be most familiar with in 1957. Each five-foot square was excavated in arbitrary unit levels of six inches except in areas where stratigraphic breaks could be used to delimit the unit level. Most of the actual digging was conducted by square-point shovels, and all cultural debris was sieved through quarter-inch, stainless-steel screens. Level bags were kept in which representative samples of bone detritus and waste flakes were deposited for later laboratory analysis. The artifacts were also bagged according to unit levels, except where they were associated with specific features. When features were run across they were excavated with trowel and whisk, and as in the case of profiles, were both photographed and diagramed.

Identical techniques were used in the excavations at House Pits 1 and 7. At House Pits 5, 10, 28, and 29, the units and techniques of excavation remained the same, but only artifacts, features, and profiles were recorded. House Pit 12 had been dug earlier in the 1950's by Mr. and Mrs. Ted Weld of Seattle, Washington, Although all the artifacts from this dig were kept together, no data about specific provenience were recorded. Fortunately, however, excavations in an undisturbed area at the lip of the house pit revealed the house type and gave us some idea about the nature of the house fill. This, coupled with a formal analysis of the artifacts, has enabled us to assign House Pit 12 an accurately defined position in the chronology at the site.

The earlier components were not discovered until the fall of 1960 at which time a series of test pits were sunk beneath the House Pit 15 excavations. In the spring of 1962 a similar section was found beneath the House Pit 13 area. These components were encased in a matrix of sterile sands and silts, and varied from 8 to 16 feet in their depth from the surface of the ground. These deposits were carefully stripped by natural stratigraphic levels. All culture-bearing deposits were screened and literally all recoverable debris saved for laboratory analysis.

Laboratory Techniques. Laboratory facilities were provided in the home of the author and included both the equipment for drafting and photographic work. Laboratory work was conducted largely by the author and his parents, Mr. and Mrs. C. G. Nelson.

Materials brought in from the field included artifacts, level bags, soil samples, profiles, C14 samples, photographs, notes, feature diagrams, and additional data from a detailed survey of Quilomene Bar. After cleaning and mending, the artifacts were labeled with both site and specimen numbers, and accompanying field data, material identification, and artifact measurements entered in two separate catalogues. The contents of every level bag were also analyzed and records kept of all materials in them. Artifacts recovered from the level bags were catalogued as described above and identifiable bone detritus set aside for future identification. Soil and C14 samples were prepared for long-term storage.

The survey data collected from Quilomene Bar and the immediately adjacent countryside included about 85 perishables recovered from storage shelters in the basalt cliffs near the site. These were catalogued and sent to Carolyn Osborne, who graciously prepared the detailed analysis which appears as Appendix C of this report.
The final drafting of all profiles and tables appearing the report was done by Mr. C. G. Nelson under the supervision of the author. Photography was also jointly handled by the author and his father, and for those who are interested, the special techniques involved in this process have already been published (C. G. Nelson 1963). [243]
APPENDIX C
PERISHABLES FROM EIGHT ROCKSHELTERS
ON QUILOMENE BAR
By Carolyn Osborne

The western edge of Quilomene Bar is flanked by high basalt cliffs in which there are numerous small rockshelters. Many of these shelters have been used for storage during the late prehistoric period, and a few may possess cultural fill from earlier times. Unfortunately, all have been completely or partially destroyed by relic hunters.

The following is a report on artifact assemblages from eight of the less thoroughly disturbed rockshelters in the area. 45KT48 is located at the south of Quilomene Bar, overlooking the mouth of Quilomene Creek. The rest of the sites (never formally designated) have been numbered with Arabic numerals. Site 1 is near the southern end of Quilomene Bar, Sites 3, 4, and 5 are adjacent to the central portion of the bar, and Sites 6 and 7 are located on the southwestern side of Sunset Creek canyon. With the exception of 45KT48 and Site 3, cultural deposits were superficial and derive from the late prehistoric or early historic periods.

45KT48

Field Specimen 1 (Fig. 104, a) from this site is the proximal or butt end of a stake or wedge; it is broken and eroded and appears to have been burned at one time (no char is visible but the erosion is typical of a burned surface). The wood is either cottonwood (Populus sp.) or willow (Salix sp.); the choice of material seems to indicate that it was a stake — a wedge would ordinarily be made of harder wood. The fragment measures 206 mm. in length and has a maximum diameter of 30 mm. The butt end was cut by notching for approximately three-fourths of its circumference and then broken; this end has been much hammered, and a central depression appears to have been formed by striking with a rounded object such as a hammerstone. The cuts to weaken the stick so that it could be broken were probably made with a metal tool.

Site 1

Site 1 yielded two fragments of cordage (F.S. 1 and 2); both are of sage bark (Artemisia sp.), 2-ply S-twist, diameters 4 and 7 mm. Lengths are short (150 and 90 mm.); they are similar to cordage used in mat sewing (see mat fragments from other sites).

In addition a shell disc bead (Fig. 104, f), a core tool (Fig. 104, c), a fish vertebra, a piece of mammal bone, and the horn core of a mountain sheep were recovered.

Site 2

Site 2 yielded 28 perishable items. Short lengths of cordage (Table 4) make up about one third of the specimens; the size and plant material of the cordage bits fall into the range used in the mat fragments from this site (Table 5). Whereas all cord used in the matting is 2-ply S-twist, there are two specimens of Z-twist cord in the unused cord fragments. Both of these are of sage bast (Artemisia), as apparently are the bulk of me cordage samples (Table 4). It should be noted that F.S. 6 is knotted at both ends. [244]

Table 4. Cordage from Site 2

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<th>F.S #</th>
<th># of Lengths</th>
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<th>Diameter</th>
<th>Degree</th>
<th>Plant Material</th>
<th>Length</th>
</tr>
</thead>
<tbody>
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<td>2</td>
<td>1</td>
<td>2</td>
<td>Z</td>
<td>5 mm</td>
<td>medium</td>
<td>sage</td>
<td>130 mm</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>2</td>
<td>S</td>
<td>4 mm</td>
<td>medium</td>
<td>sage</td>
<td>185, 280, 165, 275 mm</td>
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<tr>
<td>5</td>
<td>2</td>
<td>2</td>
<td>S</td>
<td>4-7 mm</td>
<td>medium</td>
<td>sage</td>
<td>450,550 mm</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2</td>
<td>Z</td>
<td>6 mm</td>
<td>loose</td>
<td>sage</td>
<td>220 mm</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2</td>
<td>S</td>
<td>7 mm</td>
<td>loose-med</td>
<td>sage</td>
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<td>2</td>
<td>S</td>
<td>5 mm</td>
<td>medium</td>
<td>sage</td>
<td>680 mm</td>
</tr>
</tbody>
</table>

There are seven fragments of sewed cattail matting (F.S. 12, 14, 15, 16, 17, 22, 23). The cordage used for the sewing has been tabulated in Table 5. A brief description of each specimen will follow:

F.S. 12: one warp of cattail 88 mm. long and 9 mm. in diameter; warp element is round, no evidence of creaser having been used; one sewing cord is present.
F.S. 14: two warp elements of cattail, 55 and 65 mm. long; 9 and 5 mm. in diameter respectively; round; one sewing cord.

F.S. 15: two cattail warp elements, longer is 195 mm; 9 mm. in diameter; slightly flattened but no evidence of creaser use. Warp elements are widely spaced, and tied to the sewing cord between the two warps are two lengths of the same cord; one is tied at midsection with the ends hanging down for 120 mm., the other now has one end of 120 mm. A pierced hole in the longer warp indicates a sewing interval of 110 mm.

F.S. 16: two warps of cattail, lengths ca. 113 mm.; diameters 8-9 mm.; round. Sewed with one length of cord.

F.S. 17: fragment 43 mm. wide, using small cattails approximately three to the centimeter; maximum length of warps 115 mm. Sewed with one cord length; warp elements are slightly twisted in the sewing area, probably accidental as the sewing was done.

Field specimen 13 may be the selvage of a twined mat. The specimen is highly fragmentary (61 x 16 mm.) and consists of a twined row of slightly twisted cattail, pitch up to the left, through two interstices of which arc caught short lengths of the same material. This may be the heading for a mat.

Field specimen 18 is a fragment of twined cattail matting. The warps consist of two to three cattails secured by one row of twining of untwisted sage bast with pitch up to the right. There are only three warp groups with a width of 65 mm., length of 220 mm., and an indicated interval of at least 160 mm. between the rows of twining. The whole is highly disintegrated.

Field specimen 19 is the selvage of a twined sage bast mat. The warp consists of large (17 mm.) bundles of untwisted shredded bast, folded over at the top. These are secured with one row of heavy (10 mm.) 2-ply S-twist cord of sage bast, pitch up to the left. This was a crude mat.

Field specimen 20 is similar to 19 but even more disintegrated. The warp consists of bundles of shredded sage bast; there is one row of twining using untwisted bast bundles for weft, with pitch up to the left

Field specimen 21 (Fig. 101, c) is, like 19 and 20, a disintegrating mass of shredded sage bast with two weft rows and a portion of selvage. The warp consists of wide (20 to 25 mm.) bundles of bast untwisted; the weft is a narrower bundle of bast, barely S-twist; the twining pitch is to the left; the interval of rows 90 mm. At the end of the row the paired wefts are twisted together and carried down to the next row.

F.S. 22 (Fig. 103, d): fragment of nine cattail warps, not closely spaced; diameters around 8 mm.; slightly flattened. There is one sewing row through the center, indicating a sewing interval of at least 115 mm. Size: 190 x 115 mm.

F.S. 23: fragment of eight cattail warps, approximately 30 mm. long; slightly flattened; diameters 6 to 8 mm. Three sewing rows are indicated, spaced 100 mm. apart; two have intact cordage. Size: 300 x 55 mm.

<table>
<thead>
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<th># of Lengths</th>
<th>Ply</th>
<th>Twist</th>
<th>Diameter</th>
<th>Degree</th>
<th>Plant Material</th>
<th>Length</th>
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</thead>
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<td>12</td>
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<td>2</td>
<td>S</td>
<td>4-5 mm</td>
<td>medium</td>
<td>sage</td>
<td>280 mm</td>
</tr>
<tr>
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<td>1</td>
<td>2</td>
<td>S</td>
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<td>medium</td>
<td>cedar or juniper</td>
<td>170 mm</td>
</tr>
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<td>3-4 mm</td>
<td>medium</td>
<td>cedar or juniper</td>
<td>70, 240, 160 mm</td>
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<td>sage</td>
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<td>cedar or juniper?</td>
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<td>2</td>
<td>S</td>
<td>7 mm</td>
<td>medium</td>
<td>cedar or juniper?</td>
<td>53, 48 mm</td>
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</tbody>
</table>

Eight specimens (F.S. 11, 13, 18, 19, 20, 21, 24a, 24c) are fragments of twined matting:

F.S. 11 (Fig. 101, d) appears to be the selvage of a mat. The warp elements are of slightly twisted sage bast; there are two bundles bent over at the top and secured with a twined row with pitch up to the left. The twining weft [245] is also a bundle of barely twisted sage bast, ca. 13 mm. in diameter. The whole is exceedingly crude and fragmentary. The total length of warps is 120 mm.; the width 77 mm.

Field specimen 13 may be the selvage of a twined mat. The specimen is highly fragmentary (61 x 16 mm.) and consists of a twined row of slightly twisted cattail, pitch up to the left, through two interstices of which arc caught short lengths of the same material. This may be the heading for a mat.

Field specimen 18 is a fragment of twined cattail matting. The warps consist of two to three cattails secured by one row of twining of untwisted sage bast with pitch up to the right. There are only three warp groups with a width of 65 mm., length of 220 mm., and an indicated interval of at least 160 mm. between the rows of twining. The whole is highly disintegrated.

Field specimen 19 is the selvage of a twined sage bast mat. The warp consists of large (17 mm.) bundles of untwisted shredded bast, folded over at the top. These are secured with one row of heavy (10 mm.) 2-ply S-twist cord of sage bast, pitch up to the left. This was a crude mat.

Field specimen 20 is similar to 19 but even more disintegrated. The warp consists of bundles of shredded sage bast; there is one row of twining using untwisted bast bundles for weft, with pitch up to the left

Field specimen 21 (Fig. 101, c) is, like 19 and 20, a disintegrating mass of shredded sage bast with two weft rows and a portion of selvage. The warp consists of wide (20 to 25 mm.) bundles of bast untwisted; the weft is a narrower bundle of bast, barely S-twist; the twining pitch is to the left; the interval of rows 90 mm. At the end of the row the paired wefts are twisted together and carried down to the next row.

F.S. 24a and 24c are fragments of twined matting of ryegrass (Elymus sp.); 24a has warp bundles of crowns of the grass, 10 to 12 mm. in diameter, and a maximum of 110 mm. in length. The twining weft is of loosely S-twist ryegrass 5-6 mm. in diameter. The pitch is up to the left and there is only a single row in the length of the specimen. The whole is exceedingly loose at present. Specimen 24c measures 110 x 85 mm. The warp bundles are untwisted, 9-10 mm. in diameter; there is only one row of weft, on loosely S-twist grass, ca. 7 mm. in diameter. The twining pitch is up to the left.
F.S. 24b may be a fragment of a twined soft bag or of fine matting. The warp consists of untwisted bundles of sage bast, ca. 5 mm. in diameter, 160 mm. maximum length. The weft is loosely twisted 2-ply Z-twist cord of sage bast, diameter 3 to 4 mm. There are four rows of twining, approximately 10 mm. apart, pitch to the right. The fragment is unwoven below these four rows; no selvages are present.

Field specimens 1, 9, and 10 are separated knots of untwisted bast bundles. All are of sage; 1 is solely a knot; 9 is a knot of two bundles of bast, loose, both ends broken; 10 is also a loose knot. All of these "knots" were too disintegrated to identify.

Site 3

Site 3 yielded five perishable items: one a mat fragment, the remainder lengths of cord.

The matting fragment (Fig. 103, c) measures 340 mm. (warp) x 65 mm. (width). It consists of three warp bundles of ryegrass (*Elymus*) each approximately 20 mm. wide. They are held by a single row of twining (including a selvage) with a left pitch, near one end. The weft is 2-ply S-twist juniper (*Juniperus* sp.) or cedar (*Thuja* sp.) bark, 4 mm. in diameter, folded at the selvage to form the two weft elements for twining.

The cordage is summarized in Table 6. It should be noted that field specimens 3a and 3b are loosely twisted together, some of the twists having interstices as though the cords had been twining wefts; the cord appears identical to that used in F.S. 1. The twining pitch of these was left. [246]

<table>
<thead>
<tr>
<th>FS #</th>
<th>Ply</th>
<th>Twist</th>
<th>Diameter</th>
<th>Degree</th>
<th>Plant Material</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>S</td>
<td>4 mm</td>
<td>medium</td>
<td>Cedar or juniper</td>
<td>130 mm</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Z</td>
<td>11 mm</td>
<td>medium</td>
<td>sage</td>
<td>250 mm</td>
</tr>
<tr>
<td>3a</td>
<td>2</td>
<td>S</td>
<td>5-6 mm</td>
<td>medium</td>
<td>sage</td>
<td>820 mm</td>
</tr>
<tr>
<td>3b</td>
<td>2</td>
<td>S</td>
<td>5-6 mm</td>
<td>medium</td>
<td>sage</td>
<td>680 mm</td>
</tr>
</tbody>
</table>

Site 4

Site 4 had 27 perishable items; one coiled basket fragment; one wood fragment; 18 cordage lengths; three twined cattail mat fragments; and four sewed cattail mat fragments.

The coiled basket fragment (Fig. 104, c) is tiny (20 x 7 mm.). It consists of one row of coiled warp element, a rod and splint bundle, and a few stitches of the sewing weft. Each sewing stitch in the row penetrates the bundle of the adjoining coil; there are approximately five stitches to the centimeter.

The wood fragment (F.S. 27) is a fragment from the edge of a sawed pine board, possibly from a packing crate. The end, one surface, and one edge are sawed or planed.

The twined cattail mats (F.S. 2, 12 (weft only), 23) are all highly fragmentary. One (F.S. 12) is matting only by inference.

F.S. 2 (Fig. 101, a) is a selvage fragment 600 mm. long (warp) x 230 mm. wide (weft). The warp is of cattail, approximately 6 mm. in diameter; these are folded at the top and caught in the first row of twining; the end is secured in the same twined stitch as the third warp beyond (i.e., passes over 2), on the under surface. The twining pitch is to the left; there are three weft rows in the fragment with an interval of 20 mm. The weft varies in plant material; the top binding row and the third row are of juniper or cedar (*Thuja*) bark loose S-twist, 4-5 mm. in diameter. The second weft is of cattail, loose S-twist. The matting is firm and compact.

F.S. 23 is a fragment (80 x 90 mm.) with two untwisted cattail warp bundles of approximately 9 mm. diameter with two rows of wefts of untwisted cattail. Twining pitch is up to the left with a row interval of 30 mm.

F.S. 12 appears to be the weft from a mat; it is of cattail, slightly twisted, twining pitch to the left. The spaces where warp existed are clearly visible.

The sewed matting fragments are represented by portions of only a few elements. F.S. 20 is matting only by courtesy; it consists of a long cattail fragment, constricted at one end as if from a twined row and with evidence of sewing 25 mm. below. The fragment is split at the pierced hole; only a tiny fragment of cord remains.

F.S. 21 also consists of a lone cattail warp, 95 mm. long and 10 mm. in diameter with one sewing cord intact. The warp is slightly flattened but there is no evidence of creaser use. F.S. 24 has one whole warp element and a splinter from a second cattail warp. The length is 110 mm., diameter 12 mm.; it is round and shows no evidence of creaser use. One sewing cord is intact. Field Specimen 25 has two warp elements, 10 mm. in diameter with a maximum length of 161
There is one intact sewing cord, no flattening of warps.

Sewing cords from the mats are listed in Table 7. It should be noted that field specimens 21, 24, and 25 were portions of mats, and field specimens 18 and 19 are each knotted at one end.

In addition, a metal point (Fig. 104, d) and iron axe head (Fig. 104, b), and nine flakes were recovered.

Table 7. Cordage from Site 4.

<table>
<thead>
<tr>
<th>FS #</th>
<th>Ply</th>
<th>Twist</th>
<th>Diameter</th>
<th>Degree</th>
<th>Plant Material</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>S</td>
<td>3 mm</td>
<td>medium</td>
<td>cedar or juniper</td>
<td>220 mm</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>S</td>
<td>4 mm</td>
<td>medium</td>
<td>sage</td>
<td>110 mm</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>S</td>
<td>5 mm</td>
<td>loose</td>
<td>sage ?</td>
<td>65 mm</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>S</td>
<td>3-4 mm</td>
<td>loose</td>
<td>sage</td>
<td>85 mm</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>S</td>
<td>3 mm</td>
<td>loose</td>
<td>sage</td>
<td>65 mm</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>S</td>
<td>4 mm</td>
<td>medium</td>
<td>sage</td>
<td>120 mm</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>Z</td>
<td>9 mm</td>
<td>loose</td>
<td>cedar or juniper</td>
<td>80 mm</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>Z</td>
<td>7-8 mm</td>
<td>loose</td>
<td>cedar or juniper</td>
<td>61 mm</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>S</td>
<td>8 mm</td>
<td>loose</td>
<td>sage</td>
<td>110 mm</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>S</td>
<td>7-8 mm</td>
<td>loose</td>
<td>cedar or juniper</td>
<td>60 mm</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>S</td>
<td>5 mm</td>
<td>loose</td>
<td>cedar or juniper</td>
<td>150 mm</td>
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<tr>
<td>15</td>
<td>2</td>
<td>S</td>
<td>2 mm</td>
<td>loose</td>
<td>cedar or juniper</td>
<td>90 mm</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>S</td>
<td>3 mm</td>
<td>loose-medium</td>
<td>sage</td>
<td>80 mm</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>S</td>
<td>8 mm</td>
<td>loose</td>
<td>ryegrass</td>
<td>162 mm</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>S</td>
<td>5 mm</td>
<td>loose</td>
<td>cedar or juniper</td>
<td>115 mm</td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>S</td>
<td>4 mm</td>
<td>medium</td>
<td>cedar or juniper</td>
<td>120 mm</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>S</td>
<td>2-3 mm</td>
<td>medium</td>
<td>sage</td>
<td>52 mm</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
<td>S</td>
<td>4-10 mm</td>
<td>loose</td>
<td>ryegrass</td>
<td>280 mm</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>S</td>
<td>3 mm</td>
<td>medium</td>
<td>sage</td>
<td>41 mm</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>S</td>
<td>3 mm</td>
<td>oose-medium</td>
<td>sage</td>
<td>106 mm</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>Z</td>
<td>8 mm</td>
<td>medium</td>
<td>cedar or juniper</td>
<td>102 mm</td>
</tr>
</tbody>
</table>

Site 5

There are two fragments of sewed cattail matting. In both, the cattail warps are round with no evidence of a creaser having been used; the diameter of the warps is 9 to 10 mm.; length 117 to 155 mm. The sewing cord is 2-ply S-twist, 3 mm. diameter. It is of juniper or cedar bark. Both fragments could have been from the same mat.

Site 6

This rockshelter contained few perishable items other than bits of cordage and wood fragments.

There are two fragments of twined matting and one matting selvage without weft. F.S. 18 (Fig. 103, b), the largest piece of matting, measures 305 by 85 mm. There are six warp bundles of cattail, varying in diameter from 8 to 15 mm. The weft is untwisted cattail. Twining pitch is up to the left; the two rows in the fragment are approximately 135 cm. apart. There are no selvages. F.S. 9 is the end selvage of a cattail mat 25 mm. long by 70 mm. wide. The end selvage arrangement is the same as that of F.S. 2 from Site 4. The weft is untwisted cattail, pitch up to the left; the warp bundles are about 10 mm. in diameter. F.S. 7 consists of a pair of twined cattail wefts, pitch to the left, with a fragment of cattail warp caught into one twist. The specimen measures 22 mm. (warp) by 84 mm. (weft). The final matting specimen (F.S. 17) has a series of warps bent over at the end but has no wefts present. The warps have an extra twist in the selvage. Since there are no holding wefts the warps have lost their proper placement, and no diagram of weave could be made.
The finest object in the perishable collection is a portion of a twined soft bag (Fig. 102, b) or fine mat, measuring 100 by 130 mm. with no selvage remnants. The warp consists of flat strips of sage bark, 3-6 mm. wide. The weft is untwisted strips of sage bast 2-3 mm. in diameter. The weave is twined with pitch up to the left; weft rows are 10-15 mm. apart. The whole is fairly loose, but the weave is even, forming a serviceable textile, easily and quickly manufactured.

The cordage fragments are tabulated in Table 8. Field specimen 2 may be a cord fragment.

<table>
<thead>
<tr>
<th>F.S. #</th>
<th>Ply</th>
<th>Twist</th>
<th>Diameter</th>
<th>Degree</th>
<th>Plant Material</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Z</td>
<td>4 mm</td>
<td>Loose</td>
<td>sage</td>
<td>90 mm</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Z</td>
<td>5 mm</td>
<td>loose</td>
<td>sage</td>
<td>65 mm</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>S</td>
<td>5 mm</td>
<td>medium</td>
<td>ryegrass</td>
<td>90 mm</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>S</td>
<td>3 mm</td>
<td>loose</td>
<td>sage</td>
<td>51 mm</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>S</td>
<td>5 mm</td>
<td>loose</td>
<td>sage</td>
<td>103 mm</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>S</td>
<td>3-4 mm</td>
<td>loose-medium</td>
<td>sage</td>
<td>347 mm</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>S</td>
<td>3 mm</td>
<td>loose-medium</td>
<td>sage</td>
<td>94 mm</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>S</td>
<td>4 mm</td>
<td>loose</td>
<td>sage</td>
<td>170 mm</td>
</tr>
</tbody>
</table>

Wood fragments (F.S. 11, 12, 13, 15) are all of cedar with lengths from 85 to 175 mm., and widths from 20 to 37 mm. (Fig. 104, g). All are slightly charred on ends and sides; all seem to be fragments of split shakes, either aboriginal or recently manufactured. One (F.S. 13) seems to have been smoothed on the larger plane surfaces. One end of each has been cut (shows best in F.S. 15) apparently with a knife. F.S. 14 differs from the others; it has an oval cross-section and is completely charred. It is also a heavier piece of wood, perhaps cedar heartwood. It may, however, also be part of a shake.

Site 7 contained the largest fragments of sewed matting in the series. Two fragments make up F.S. 1 (Fig. 101, b): one with portion of side selvage remaining measures 285 x 170 mm.; the other, with no selvage, 270 x 120 mm. Warp is cattail, 2 to 6 mm. in diameter; the weft is 2-ply S-twist bast, (unidentified) with diameter of 3-5 mm. The mat is sewed with a row interval of 190 mm. At the selvage, the sewing cord is carried down the edge, reinforced with another cord, the sewing cord passing through the twist of the other.

Field specimen 4 (Fig. 102, a) is a fragment of soft bag or fine mat of cedar or juniper bark, measuring 130 x 95 mm. The warp consists of flat strips of bark, 5 mm. wide; the weft is single-ply S-twist of the same bast. The textile is twined with pitch up to the left; rows are 10 mm. apart at the center and 15 mm. at one end, which may indicate an attempt at shaping. There are no selvages. The object was crude but evenly executed and serviceable.

F.S. 3 is barely worked -- it consists of long strands (520 mm.) of slightly S-twist sage bast, tied at one end to a length of 2-ply S-twist cord. The object appears to have been made for some momentary use.

There are five cordage lengths (P.S. 2). All appear to be of sage bast, are 2-ply S-twist with diameters from 3 to 7 mm., loose to medium degree and lengths from 195 to 320 mm.

The final object from the site is the end of a wood dibble or a pointed stake (Fig. 103, a). The object is 470 mm. long, broken at the proximal end; it is 25 mm. in diameter at the broken end, tapering smoothly to a blunt, rounded point ca. 10 mm. in diameter. It has been burned at the broken end and the burned section largely eroded.

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Weld, Willi


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White, Thain


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   Hole-in-Wall Cave (Swanson 1956, 1962a)
   Shalkop Site (Swanson 1956, 1962a)
   Lee Site (Swanson 1956, 1962a)
   Hole-in-the-Wall Canyon Site 45KT12 (Kidd 1964)
4. Sourdough Creek 45YK5
5. Strawberry Island 45FR5 (Osborne et al 1961)
   Wallula 45WW6 (Shiner 1961)
   Sheep Island 45BN5 (Osborne et al 1961)
   Rabbit Island 45BN15 (Crabtree 1957)
   Cold Springs 35UM7 (Shiner 1953a, 1961)
7. Nakemop Mound 45KL72 (Caldwell 1956, Butler 1958a)
   Indian Wells 45KL42 (Butler 1958c)
   Five Mile Rapids 35WS54 (Cressman 1960)
8. Goldendale Site
9. Wanis Creek 45YK51 (Warren et al 1963)
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    Ash Cave 45WW61 (Butler 1958b, 1962a)
    Fish Hook Island 45FR42 (Landel 1958)
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    Tucannon Site 45CO1 (C. M. Nelson 1966)
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33. Kamloops Survey (Smith 1913)
34. Lochnore-Nesikep Creek Locality (Sanger 1963, 1966)

Figure 1. Locations of Important Sites and Surveys Cited in Text.
Figure 2. Oblique View of Quilomene Bar and Environs.
Figure 3. Site Locations on Quilomene Bar.
**Figure 5. Stratigraphic Section in the House Pit 15 Excavations Taken Parallel to the River Bank.**

**Figure 6. Stratigraphic Section in the House Pit 15 Excavations Taken Perpendicular to the River Bank.**
Figure 7. Points, Knives, and Core Tools from Cultural Component 1.
Figure 8. Artifacts from Cultural Components I and II.
Figure 9. Core Found Resting on Cultural Component I.
Figure 10. Schematic Profile in the House Pit 13 Area.
GEOLOGIC STRATIGRAPHY

5. Fine sandy loam, midden and housepit fill.
4. Fine sandy loam, flood plain loess.
3. Fine sand, beach sand.
2. Loamy fine sand, beach sand and flood-plain loess.
Subrounded basalt cobble gravel, alluvial fan.
*Stratum does not appear in this stratigraphic section.

Approximate position of preserved stratigraphic section WSU-63-1.
Figure 11. Projectile Points from Cultural Component III.
Figure 12. Chipped Stone Artifacts from Cultural Component III.
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Figure 14. Artifacts from Cultural Component V.
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FIGURE 18. SCHEMATIC RELATIONSHIPS BETWEEN HOUSE FLOORS IN THE HOUSE PIT 15 AREA.

FIGURE 19. SUBCOMPONENTS IN THE HOUSE PIT 15 AREA.
**GEOLOGIC STRATIGRAPHY**

1. **Sand veneer, historic and disturbed.**
2. Fine sandy loam, midden and housepit fill.
3. Fine sandy loam, flood-plain loess.
4. Fine sand, beach sand.
5. Loamy fine sand, beach sand and flood-plain loess.
6. Rounded basalt cobble gravel, alluvial fan.

*Stratum does not appear in this stratigraphic section.*

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**Figure 20.** East-West Stratigraphic Section through Subcomponents VII B and VII F.

**Figure 21.** East-West Stratigraphic Section through Subcomponents VII C and VII H.

**Figure 22.** North-South Stratigraphic Section through Subcomponents VII C and VII H.
GEOLOGIC STRATIGRAPHY

6 Sand veneer; historic and disturbed.
5 Fine sandy loam; midden and housepit fill.
4 Fine sandy loam; floodplain loess.
3 Fine sand; beach sand.
* Loamy fine sand; beach sand and floodplain loess.
2 Subrounded basalt cobble gravel; alluvial fan.

*Stratum does not appear in this stratigraphic section.

Figure 23. East-West Stratigraphic Section through Subcomponents VII D and VII E.

Figure 24. Plan View of House Pit 7.
Figure 25. Selected Artifacts Typical of Cayuse I Subphase Assemblage.
**Figure 26.** House Pit 1, Map of Excavations.

**Geologic Stratigraphy**

- **1** Sand veneer; historic and disturbed.
- **2** Fine sandy loam, midden and housepit fill.
- **3** Fine sandy loam, flood plain loess.
- **4** Fine sand; beach sand.
- **5** Loamy fine sand, beach sand and flood plain loess.
- **6** Should not appear in this stratigraphic section.

**Figure 27.** Profile at Southern Lip of Subcomponent VII G.

**Profile A**

- **5R6**
- **5R7**
- **4R6**
- **4R7**

**Profile B**

**Figure 28.** Feature Complex at Northern Edge of Subcomponent VII G.
GEOLOGIC STRATIGRAPHY

- Sand veneer; historic and disturbed.
- Fine sandy loam; midden and housepit fill.
- Fine sandy loam; flood plain loess.
- Fine sand; beach sand.
- Loamy fine sand; beach sand and flood-plain loess.
- Subrounded basalt cobble gravel; alluvial fan.

*Stratum does not appear in this stratigraphic section.

**Figure 29. Stratigraphic Section at the Northern Edge of Subcomponent VII I.**

**Figure 30. Reconstructed North-South Stratigraphic Section Through Subcomponent VII K.**

**Figure 31. Stratigraphic Section at the Southern Edge of Subcomponent VII J.**
Figure 32. Projectile Point Types Typical of the Cayuse III Subphase. Type 5, h-j; Type 6, a-g, l-r; Type 8, x-jj; Type 9, s-w; Type 10, kk-oo.
Selected Artifacts Typical of the Cayuse III Subphase. Triangular projectile points, a-c. Pentagonal knives: Type 1, e; Type 2, d. Bone and antler projectile points: Type 1, f-g; Style 2, h. Composite harpoon toggle, Type 1, i; composite harpoon tips, Style 1, k. Composite harpoon tips or barbs: Type 1, j; Form 1, i. Gambling bones: Type 1, p; Style 1, m-o. Beaver tooth chisel or gouge, q.
**Figure 34: Schematic Development of Stemmed and Leaf Shaped Projectile Points.**

See text for an explanation of lined and stepped specimens.
Figure 35. Schematic Distribution of Chipped Stone Projectile Points.

Figure 36. Schematic Distribution of Stemmed Projectile Point Types during the Cayuse Phase.
Figure 37. Stemmed Projectile Points, Types 1 through 4.

Type 1, a-d: Type 2, p-q; Type 3, e-k; Type 4, l-o. Cultural Components: II, d; III, a-c, j, l-m, o, q; IV, e; IV or V, f; V, g-i, k, n; undesignated (probably III), p. Basalt, c, l, o; obsidian, m; cryptocrystalline silica, a-b, d-k, n, p-q. Scale 1:1.
Figure 38. Stemmed Projectile Points, Type 5.

Type 5: Variant 5A, a-e; Variant 5B, f-i; Variant 5C, l-p; Variant 5D, j-k; miscellaneous specimens, q-v. Cultural Subcomponents: VIIA, k-l, n-p, t-u; VIIIB, f-g; VIIID, b; VIIIE, m; VII-I, c-d, h, q, v; VII, undesignated, a, i-j, r-s. Component undesignated (probably VI), e. Cryptocrystalline silica, a-j, l-v; obsidian, k. Scale 1:1.
Figure 39. Stemmed Projectile Points, Type 6.

Type 6: Variant 6A, a-h; Variant 6B, p-r; Variant 6C, i-o; Variant 6D, aa-ee; Variant 6E, s-w; Variant 6F, x-y; Variant 6G, z; miscellaneous specimens, ff-ll. Component VII, Subcomponent: VIIA, k, n, s, v, cc-dd, ff-gg; VIIIB, d, ee; VIIID, m, t, kk; VIIIF, u, x; VIIG, bb; VIIIH, a-c, f, i-j, z, hh; VII-1, e, g-h, w, y, ii, ll; VIIL, q; undesignated, l, o-p, r, aa, jj. Cryptocrystalline silica, a-ll. Scale 1:1.
Figure 40. Stemmed Projectile Points, Types 7 and 9.

Type 7, hh-nn. Type 9: Variant 9A, a-t; Variant 9B, u-w; Variant 9C, x-y; Variant 9D, z-bb; Variant 9E, cc-ee; Variant 9F, ff-gg. Cultural Component VII, Subcomponent: VIIA, kk-nn; VIIB, hh; VIID, jj; VIIF, ii; VIIH, b, f, j, p-q, z; VII-I, a, c-d, g-i, k, m-o, r-w, bb-cc, ee-gg; VIIL, y, dd; undesignated, e, l. Cryptocrystalline silica, a-aa, cc-nn; obsidian, bb. Scale 1:1.
Figure 41. Stemmed Projectile Points, Types 8, 10, and 11.

Type 8: Variant 8A, a; Variant 8B, b-d; Variant 8C, e; Variant 8D, f-h; Variant 8D, i-m; Variant 8F, n-p; Variant 8G, q-r; miscellaneous specimens, s-z. Type 10: Variant 10A, jj-kk; Variant 10B, ll-mm; Variant 10C, aa-ii; Variant 10D, nn. Type 11: Variant 11A, oo-pp; Variant 11B, qq-rr. Cultural Component VII, Subcomponent: VIIH, f, i-k, o, q, y, jj-kk, mm, oo; VII-I, a-e, g, l-n, -, r-x, z-ff, hh-ii, nn, pp-rr; VII-L, a; und., h, gg, ll. Basalt, l, w; cryptocrystalline silica, a-k, m-v, x-rr. Scale 1:1.
Figure 42. Stemmed and Leaf-shaped Projectile Points, miscellaneous forms.

Stemmed projectile points: Form 1, a; Form 2, b-c; Form 3, d; Form 4, e-f; Form 5, g; Form 6, h; Form 7, i; Form 8, j; Form 9, k; Leaf-shaped projectile points: Form 1, l-p. Cultural Component VII, Subcomponent: VIIA, b-c, h, n; VIID, m; VIIF, f, j; VIIH, a; VII-I, e, g, l, o-p; und., d, i. Basalt, j; quartzite, k; cryptocrystalline silica, a-i, l-p. Scale 1:1.
Figure 43. Leaf-shaped Projectile Points, Type 1 and Style 1.
Type 1, a-h; Style 1, k-p. Cultural Components: I, d, f, h-i; II, e, g, l; III, a-c, k, n, p; IV, m, o; V, j. Cryptocrystalline silica, a-p. Scale 1:1.
Figure 44. Triangular Projectile Points.

Type 1: Variant 1A, a-c; Variant 1B, d-f; Variant 1C, g-s. Form 1, t; Form 2, u-v; Form 3, w; Form 4, x. Cultural Component III, x. Cultural Component VII, Subcomponent: VIIA, a, c, i, k, t, v-w; VIIIB, n; VIID, g; VIIE, u; VIIH, h, q; VII-1, d-e, j, r-s; und., f, l, o-p. Cryptocrystalline silica, a-x. Scale 1:1.
Figure 45. Semi-triangular and Lanceolate Projectile Points or Knives.

Semi-triangular points or knives: Type 1, a-d; Type 2, e-h; Style 1, m-n; Form 1, i; Form 2, j-k. Lanceolate points or knives: Form 2, o; Form 3, l. Cultural Component VII, Subcomponent: VIIA, e, g-h; VIIH, c-d, f, l; VII-I, a-b, i-k, m, o; und., n. Cryptocrystalline silica, a-o. Scale 1:1.
Figure 46. Pentagonal Knives and Points.
Type 1, e-i; Type 2, a-d; Style 1, j-l; Form 1, n; Form 2, m. Cultural Component VII, Subcomponent: VIIA, j-k; VIIB, f; VII-I, a-e, g-i, l-n. Cryptocrystalline silica, a-n. Scale 1:1.
Figure 47. Chipped Stone Knives, Type 1.
Type 1, a-m. Cultural Component VII, Subcomponent: VIIA, a, c, e-h, k; VIID, l; VIIH, b; VII-I, m; und., d, i-j. Cryptocrystalline silica, a-m. Scale 1:1.
Figure 48. Chipped Stone Knives, Type 2.
Cultural Component III, a-b. Cryptocrystalline silica, a-b. Scale 1:1.
Figure 49. Chipped Stone Knives, Styles 1 through 4.

Style 1, a-d; Style 2, e-h; Style 3, i-j; Style 4, k-l. Cultural Component VII, Subcomponent: VI/6, b, d-h, l; VIIB, j-k; VII-I, c; und., a, i. Cryptocrystalline silica, a-I. Scale 1:1.
Figure 50. Chipped Stone Knives, Styles 5 through 9.

Style 5, a-b; Style 6, c-d; Style 7, e-f; Style 8, g-h; Style 9, i-j. Cultural Component VII, Subcomponent: VIIB, c, g; VIID, e, i; VII-I, b, d, h; und., a, f, j. Cryptocrystalline silica, a-j. Scale 1:1.
Figure 51. Chipped Stone Knives, Styles 10 and 11, Forms 1 through 5, and miscellaneous specimens.

Style 10, a-b; Style 11, c-e; Form 1, f-g; Form 2, h; Form 3, i; Form 4, j; Form 5, k; miscellaneous specimens, l-n. Cultural Component VII, Subcomponent: VIIA, b-c, f, h, j, l; VIIB, a; VIIF, i; VIIH, d; VII-I, k, m; VIIL, e; und., g, n. Cryptocrystalline silica, a-n. Scale 1:1.
Figure 52. Chipped Stone Knives, Forms 6 and 7, and miscellaneous specimens.

Form 6, j; Form 7, i; miscellaneous specimens, a-h. Cultural Component II, e; Cultural Component III, f; Cultural Component VII, Subcomponent: VIIA, a, c; VIID, g; VIIH, d; VII-I, j; und., b, h-i. Cryptocrystalline silica, a-j. Scale 1:1.
Figure 53. Core Tools, Types 1 and 2, and Forms 1 and 2.
Type 1, a-d; Type 2, e-h; Form 1, i-j; Form 2, k-l. Cultural Component I, c; Cultural Component III, d, j-l; Cultural Component V, b; Cultural Component VI, e-f. Cultural Component VII, Subcomponent: VIIA, g-i; und., a. Cryptocrystalline silica, a-l. Scale 1:1.
Figure 54. Chipped Stone Scrapers, Type 1 (end scrapers).

Cultural Component I, b. Cultural Component VII, Subcomponent: VIIA, 1; VIIC, n; VIID, e, g, m; VIIH, h-i; VII-I, f, j-k; und., a, c-d. Cryptocrystalline silica, a-n. Scale 1:1.
Figure 55. Chipped Stone Scrapers, Type 2 (side scrapers).

Type 2: Variant 2A, a-b; Variant 2B, c-d; Variant 2C, e-o. Cultural Component VII, Subcomponent VIIA, a, g, j, m; VIIB, i, n-o; VIID, l; VIIG, h; VIIH, k; VII-I, b-f. Cryptocrystalline silica, a-o. Scale 1:1.
Figure 56. Chipped Stone Scrapers, Type Variants 2D and 3A, and Styles 3 and 4. 
Type Variant 2D, a-d; Type Variant 3A, e-g; Style 3, h-j; Style 4, k-l. Cultural Component I, a, k; Cultural Component III, g. Cultural Component VII, Subcomponent: VIIA, b-d, h; VIID, f, j; und., e, i, l. Cryptocrystalline silica, a-l. Scale 1:1.
Figure 57. Scrapers, Type Variant 3B.
Cultural Component VII, Subcomponent: VIIB, a; VIIG, b; Cryptocrystalline silica, a-b.
Scale 1:1.
Figure 58. Scrapers, Styles 1 and 2.
Style 1, a-e; Style 2, f-g. Cultural Component VII, Subcomponent: VIIB, c; VIID, a, d; VIIL, f; und., c. Cryptocrystalline silica, a-g. Scale 1:1.
Figure 59. Chipped Stone Gravers and Drills.

Gravers: Type 1, a-e; Style 1, f-h; Form 1, i-j. Drills or awls, k-r. Cultural Component VI, c. Cultural Component VII, Subcomponent VIIA, a-b, l-m, o, q; VIIB, g; VIID, f, j, n; VIIG, h; VII-I, i, k, r; und., d-e, p. Cryptocrystalline silica, a-r. Scale 1:1.
Figure 60. Bifacially Flaked Tool.

This specimen was recovered from a cache pit at the bottom of Stratum 5 in the House Pit 1 excavations. It lay outside the area of the house and therefore antedates Subcomponent VIIG. Material, cryptocrystalline silica. Scale 1:1.
Figure 61. Possible Microblades.
Cultural Component I, e; Cultural Component III, a-b; Cultural Component VI, d.
Cultural Component VII, Subcomponent: VIIG, i; VIHI, g; VIIL, c; und., f, h. Cryptocrystalline silica, a-i. Scale 1:1.
Figure 62. Possible Microblade Cores form Cultural Component III. These specimens are of cryptocrystalline silica. The one labeled a is fragmentary. Scale 1:1.
Figure 63. Utilized Flakes.

Cultural Component IV or V, d; Cultural Component V, f, n. Cultural Component VI, l. Cultural Component VII, Subcomponent: VIIA, g, k; VIIF, m; VIIIG, a; VIIH, c, i-j; VII-I, h; und., b, e. Cryptocrystalline silica, a-n. Scale 1:1.
Figure 64. Basalt Spall Scrapers.
Cultural Component VII, Subcomponent: VIIC, a; VIID, f; VIH, c, e, g, i; VIIL, d; und., b, h, j. Basalt, a-j. Scale 1:2.
Figure 65. Cobble Scraping Planes.
Cultural Component III, d. Component undesignated (resting on the surface of Cultural Component I), a-c. Basalt, a-d. Scale as indicated.
Figure 66. Miscellaneous Flaked Cobble Tools.

Cultural Component III, a; Cultural Component V, f. Cultural Component VII, Subcomponent: VIIA, d; VIIC, b; VIID, g; VIID, c; und., e, h. Basalt, a-c, f-g; quartzite, h; porphery, d; unknown, e. Bifacially flaked, a, d, f; unifacially flaked, c, e, g-h; multifacially flaked, b. Scale 1:2.
Figure 67. Pestles and Hammerstones, Style 1.
Pestles, a-c; Hammerstones, Style 1, d-f. Cultural Component VII, Subcomponent VIIA, d, f; VIIC, e; VIIG, a; VIIH, c; VII-I, B. Basalt, b-e; granite, a; unknown, f. Scale 1:2.
Figure 68. Hammerstones, Styles 2 and 3.
Style 2, d-e; Style 3, a-c. Cultural Component VII, Subcomponent: VIIA, c; VIIB, d; VIIC, a; und., b, e. Basalt, a-e. Scale 1:1.
Figure 69. Hammerstone, Form 1.
Figure 70. Chopper-like Crushing Implements, Style I.
Cultural Component VI, e; Cultural Component VII, Subcomponent: VIIH, f; und., a-d. Basalt, a-b, d, f; unknown, c, e. Scale 1:2.
Figure 71. Ground Adzes.
Figure 72. Pipes.
Figure 73. Shaft smoothers.
Figure 74. Beads, Pendants, and Miscellaneous Ground Stone Artifacts.

Beads and pendants: Style 1, a-i; Style 2, j-m; Style 3, n; Form 1, o; Form 2, q-w; Form 3, p. Sandstone balls, x-y; ground disc fragment, z; faceted basalt object fragment, aa. Cultural Component V, j; Cultural Component VII, Subcomponent: VIIA, f, t; VIIG, aa; VIIH, a-e, g-i, k-s, u-y; und., z. Lignite, a, e; steatite, o, r-t; slate, n, q; graphite, j-m; basalt, b, f-g, aa; sandstone, c, x-y; concretion, z; unknown, d, h-i, p, u-w. Scale 1:1.
Figure 75. Incised Slate Tablet Fragment.
This specimen was recovered along the river bank in slough deriving from Stratum 5. It may therefore be assigned to Cultural Component VII.
Figure 76. L-Shaped Scapula Awls (Type 1).
Cultural Component VII, Subcomponent: VIIA, a-c; VIIIB, d; VII-I, e-f; und., g. Scale 1:1.
Figure 77. A Section of Scapula Cut in the Process of Manufacturing L-Shaped Scapula Awls (Type 1).
Cultural Component VII, Subcomponent VIIB. Scale 1:1.
Figure 78. Split Metapodial Awls (Type 2).
Cultural Component VII, Subcomponent: VIIA, g; VIIB, e, h; VIIH, d, i; VII-I, b, f; und., a, c, j. Finely finished, f-g; crudely finished, a-e. Scale 1:1.
Figure 79. Splinter Awls (Type 3).

Cultural Component VII, Subcomponent: VIIA, c; VIIB, a; VIID, g; VIIH, h-i; VII-I, d-f; und., j. Scale 1:1.
Figure 80. Small Splinter Awls (Type 3). Cultural Component VII, Subcomponent: VIIB, a; VIIM, b-d. Scale 1:1.

Figure 81. Awls, Style 1, and Forms 1 and 2. Style 1, b; Form 1, a; Form 2, c. Cultural Component VII, Subcomponent: VIIA, c; VII-I, b; und., a. Scale 1:1.
Figure 82. Pins and Needles.

Cultural Component VII, Subcomponent: VIIB, g; VIIC, e-f; VIIH, a; VII-I, b-c; und., d.
Antler, a, d, f; bone, b-c, e, g. Scale 1:1.
Figure 83. Bone and Antler Pins from Subcomponent VIIC. Specimens b through e are incomplete. Scale 1:1.

Figure 84. Composite Harpoon Valves, Type 1 and Form 1. Type 1, b, Form 1, a. Cultural Component VII, Subcomponent: VIID, a; VII-I, b. Scale 1:1.
Figure 85. Projectile Points, Barbs, and Composite Harpoon Tips and Valves.

Projectile points: Type 1, a-f; Style 2, h; Style 3, t-u; Form 1, g. Composite harpoon valve, Type 1, q; composite harpoon tips, Style 1, m-n. Composite harpoon valve tips or three pronged fish spear barbs: Type 1, j-l, r-s; Form 1, i, o-p. Cultural Component VII, Subcomponent VIIA, i; VIIB, a; VIIG, f; VIIH, h, m-n; VII-I, b-e, g, j-l, p-q, t-u; und., o, r-s. Scale 1:1.
Figure 86. Digging Stick Handle, Hafts, and Lateral Barb Guards for Fish Spears.
Digging stick handle, a; lateral barb guards, d-e. Hafts: Type 1, b; Form 1, c. Cultural Component VII, Subcomponent: VIIA, c-e; VII-I, b; und., a. Scale 1:1.
Figure 87. Incised digging stick handle from the floor level of Subcomponent VIIB.
Figure 88. Spatulate Scrapers and Fleshing Implements.

Spatulate scrapers, a-d; fleshing implement, e. Cultural Component VII, Subcomponent: VIIA, d-e; VIIB, c; VIIF, a; VIIG, b. Scale 1:1.
Figure 89. Flaking Implements.

Type 1, g-j; Style 1, e-f; Form 1, a-b; Form 3, c-d. Cultural Component VII, Subcomponent VIIA, i; VIID, a, e; VIIH, d, g; VII-I, h, j; und., b, f. Scale 1:1.
Figure 90. Antler Splitting Wedges and Bone Chisel.
Antler splitting wedges, b-e; bone chisel, z; Cultural Component VII, Subcomponent VIIG, e; VII-I, b, d; und., a, c. Scale 1:1.
Figure 91. Beaver Tooth Engravers and Worked Canine Tooth.  
Beaver tooth engravers, b-c; worked canine tooth, a. Cultural Component VII, Subcomponent: VIIH, b; und., a. Specimen c was recovered from the beach in front of the site; the component is not designated. Scale 1:1.

Figure 92. Bone Hammer and Chisel. 
Hammer, a; chisel, b. Cultural Component VII, Subcomponent: VIIC, a; und., b. Scale 1:1.
Figure 93. Gambling Bones, Beads, and Pendants.

Gambling bones: Type 1, f; Style 1, b-e; Form 1, a. Beads and pendants: Type 1, j-l;
Style 1, g-i; Form 2, n; Form 3, o; Form 4, m. Cultural Component VII, Subcomponent: VIIA,
a; VIIG, j (right specimen); VIIH, d; VII-I, b-c, e-f, m, l; VIIIL, n; und., g-i, j (left specimen), k
(all specimens), o. Scale 1:1.
Figure 95. Antler comb.
Figure 96. Cut Bone Detritus and Adzed Antler Beams.
Figure 97. Shell Artifacts.

Shell ornaments of trade: Type 1, h; Type 2, f; Form 2, d; Form 3, g. Shell artifacts of utility, e. Shell artifacts of local manufacture: Type 1, c; Form 1, b; Form 2, a. Cultural Component VII, Subcomponent; VIIB, g; VIIC, h (top specimen); VIIG, e; VIIH, c-d, h (bottom specimen); VII-I, a-b, h (middle specimen); und., f. Scale 1:1.

Figure 98. Abalone Pendant from Subcomponent VIIH.
Figure 99. Rowel from the Fill in Subcomponent VII-I and Phoenix Button from Subcomponent VIII where it overlies Subcomponent VIIH. Scale 1:1.

Figure 100. Lock Plate probably from an English Pattern Rifle or Northwest Gun. It was recovered high in the fill of Subcomponent VII-I. Scale 1:1.
Figure 101. Perishables from Sites 2, 4, and 7.
Figure 102. Mat or Bag Fragments.
A soft mat or bag fragment, Site 7; b, soft bag or mat fragment, Site 6.
Figure 103. Perishables from Sites 2, 3, 6, and 7.
A, dibble, Site 7; b, matting, Site 6; c, ryegrass matting, Site 3; d, cattail matting, Site 2.
Figure 104. Artifacts from Sites 45KT48, 1, 4, and 6.

A, wedge, 45KT48; b, iron adze blade or axe, Site 4; c, core tool, Site 1; d, iron point, Site 4; e, basketry fragment, Site 4; f, disc bead, Site 1; g, cedar shake fragment, Site 6. Scale 1:1.