UNIVERSITY OF ALBERTA

THE FREMONT IN IDAHO

BY

Diane L. Cockle ©

A Thesis Submitted to the Faculty of Graduate Studies and Research in Partial Fulfillment of the Requirements for the degree of Master of Arts

DEPARTMENT OF ANTHROPOLOGY

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ABSTRACT

During the 1959/60 excavations at Wilson Butte Cave , Gruhn (1961) uncovered abundant archaeological material from the uppermost stratigraphic zone, with dry vegetal material in a matrix of aeolian silt. The artifact complex from this zone, stratum A, was designated the Dietrich phase; and attributed by Gruhn to a late prehistoric Shoshone occupation. Later, B. Robert Butler reexamined the pottery of the Dietrich phase from Wilson Butte Cave, identifying it as Great Salt Lake Gray ware; and argued for a Fremont occupation. By 1988/89 Stratum A was completely destroyed, but in 1991 it was possible to study the extensive artifact collections from Stratum A made in the 1950s by the local collectors Wayne Perron and Smoky Webb. These artifacts, together with the late prehistoric artifacts recovered by Gruhn in 1959/60 and 1988/89, support the interpretation of a Fremont presence at Wilson Butte Cave.

In addition to the Great Salt Lake Gray ware, Fremont elements represented in the late prehistoric occupation levels at Wilson Butte Cave include a fragmentary specimen of coiled rod-and-bundle basketry of late Fremont type, numerous small rectangular bone gaming pieces, several crude clay figurines, a one-piece "hock" moccasin, wrapped sagebrush bark coils, an elk-tooth bead, bone tubular beads, and a very high frequency of small corner-notched projectile points (Rosegate type). The high concentration of indisputably Fremont artifacts in the Wilson Butte Cave collection is sufficient evidence to accept the Fremont as an element in the culture history of southern Idaho.

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All illustrations have been done by the author, if not otherwise noted; and all errors and/or omissions in this thesis are the responsibility of the author.

THE FREMONT IN IDAHO

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CHAPTER 1: INTRODUCTION

The site of Wilson Butte Cave is located in the west-central part of the Snake River Plain, in the northeast part of Jerome County (for a full description of the environment, vegetation, and fauna of the area refer to Gruhn 1961:1-6). The cave is located about a quarter mile west of the crater of Wilson Butte, in the NE 1/4 of Section 27, Range 19 E (Boise Meridian), Township 7 S (Boise Baseline), Jerome County (Fig. 1-2) . It is at approximately 42° 46' north latitude and 114° 13' west latitude, and elevation is estimated at about 4 300 feet a.s.l. (Twin Falls Quadrangle, U.S. Geological Survey).

This thesis addresses the question of a Fremont occupation of southern Idaho. It will show that the analysis and classification of material collected from the uppermost stratum of Wilson Butte Cave, it has been possible to identify a Fremont occupation during the Dietrich phase of southern Idaho's culture history. Based on radiocarbon analysis of samples taken from the upper level of Stratum B and the middle of the overlying Stratum A at Wilson Butte Cave, the estimated time span of the Dietrich phase is ad. 1300 to ad. 1700-1750 (Gruhn 1961:122).

Gruhn's 1961 Wilson Butte Cave report stated that "an identification of the people of the Dietrich phase at Wilson Butte Cave as Shoshonean is fairly certain" (Ibid: 143). However, due to the later reclassification of the cave's pottery assemblage by B. Robert Butler, and the discovery of Fremont basketry in the cave in 1989, it became apparent to Gruhn that perhaps the Wilson Butte Cave assemblage from stratum A represented more than one cultural group.

In May, 1980, Butler had Jesse Jennings at the University of Utah re-examine the Wilson Butte Cave sherds; it was concluded that they were all of the Great Salt Lake Gray pottery, a specifically Fremont type (Butler 1981:2). Butler was the first to suggest a late prehistoric Fremont incursion into the region before, or perhaps during the early occupation of the Shoshone. This hypothesis is considered controversial, since the cultural limits of the Fremont were defined by Steward (1940:467) as extending no farther than the Uinta Mountains in northern Utah, with a terminal date no later than 1350 A.D. (Holmer and Weder 1980:55; Gunnerson 1960:377). Butler's proposed Fremont migration theory has always been considered controversial by his peers in Idaho and Nevada; and after Butler gave up archaeology in the late 1980s, the question faded to the background, although it was never entirely resolved.

By 1989/90 there was a resurgent interest in a possible Fremont occupation, as further Fremont artifacts were recovered from Wilson Butte Cave by Gruhn during 1988/89 excavations. Access had also recently been gained to two extensive private collections of artifacts from stratum A. This new evidence provided an excellent opportunity to resolve the argument of whether or not the Fremont had ever physically occupied Wilson Butte Cave, and southern Idaho.

One hypothesis is that some time after 750 A.D. and before 1600 A.D., the Fremont, due to difficulties maintaining their subsistence strategy in the Great Salt Lake region of northern Utah, moved northward into the Snake River Plateau region of southern Idaho. The Shoshone moved into the same area during the Numic spread from the southwest corner of the Great Basin by 1000 A.D.. Before either the Fremont or the Shoshone arrived in Idaho, the area had already been occupied for some time. Gruhn's excavation demonstrated a possible occupation of Wilson Butte Cave as early as 15,000 B.P. (Butler 1968: fig. 15). The earliest of these people, generally called Paleo-Indians, were engaged in big game hunting from 12,500 - 5800 B.C.; among the animals they hunted with their Clovis and Folsom and Plano pointed spears, were extinct species of elephant (<u>Mammuthus</u> <u>sp</u>.); bison (<u>B</u>. <u>antiquus</u>) and camel (<u>Camelops</u> <u>sp</u>.). By

6000 B.C., these Paleo-Indians had developed into what archaeologists call Archaic-Indians due to the introduction of atlatl technology, which is recognized in the archaeological record by the introduction of the notched projectile point. What we know of these so-called Archaic peoples suggests they were migratory hunters and gatherers exploiting the same environment of southern Idaho that the Fremont and Shoshone eventually did (Butler 1968). There is insufficient information to postulate what happened to this group if the Fremont or Shoshone intruded into their economic region. Perhaps they were out-competed by the more efficient technology of the others, or perhaps they were absorbed by them.

Another possibility is that the technological influences which had emanated from the Anasazi people around 400 A.D. and initiated the <u>in situ</u> development of the Fremont in Utah, reached as far as Southern Idaho and introduced Fremont traits to the preexisting Archaic technology. This hypothesis would imply that the Fremont did not migrate on to the Snake River Plain but rather, local Archaic people adopted traits defined as Fremont.

In the late prehisoric period the Fremont and the intrusive Shoshone probably peacefully cohabited in the Snake River Plains region, both exploiting the similar resources, the Fremont perhaps engaged in some form of horticulture. It is my hypothesis that the Fremont were extinguished by the Shoshone by the end of the late prehistoric period, since ethnographically, the Shoshone do not retain any of the material culture traits of the Fremont. I will attempt to demonstrate that the Fremont were a physical presence in Wilson Butte Cave sometime during the Dietrich phase, through the analysis of the private Perron/Webb (P/W) collection. I have differentiated Fremont from Shoshone artifacts using archaeological and ethnographic information from the Great Basin (including Idaho).

In order to demonstrate a Fremont occupation and the persistence of another culture independent from the Shoshone, there are several arguments that would argue against a Fremont occupation which must be addressed in this thesis.

HYPOTHETICAL ARGUMENTS AGAINST A FREMONT OCCUPATION

1. The artifacts which have previously been classified as Fremont or Shoshone in archaeological origin may be wrong, leading me to err in my classification of Fremont and Shoshone artifacts from the P/W collections. This would mean we could not trust any archaeological collections for comparative purposes in identifying prehistoric ethnic groups.

2. Artifacts classified as Fremont in the P/W collections may be present in Idaho due to trade, warfare, or physical contact between a Utah-based Fremont group and an Idaho Shoshone group, rather than the result of Fremont diffusion or migration. This would mean that there was a trading relationship between contemporaneous Fremont and Shoshone groups in Idaho and Utah.

3. The artifacts classified as Fremont in the P/W collections may be present as a result of Shoshone scavenging in Fremont sites of Utah. This would mean that the Idaho Shoshone settlement pattern range would have to be expanded.

4. The Idaho Shoshone are the descendants of the Fremont. This would mean that the Shoshone would have retained some aspects of Fremont material culture in the ethnographic record.

5. Did Fremont cultural traits develop in southern Idaho out of a Desert Archaic population, as they did in Utah? If this is the case, then Idaho Fremont did not immigrate into the area but are the descendants of the Archaic peoples who have occupied the region for at least 11 - 12, 000 years. Antiquity of Fremont traits in Idaho would have to be demonstrated.

POSSIBLE SOLUTIONS FOR THESE QUESTIONS

1. A survey of the types and concentrations of artifacts found in a large number of Fremont and Shoshone sites is needed to establish the general range of material culture variation for each group.

a. If the artifacts previously classified as Fremont in the P/W collections fit within the parameters of the range of Shoshone material culture, then these artifacts do not represent a Fremont oc upation. We must, rather, expand our concept of what the Shoshone material culture consists of.

2. An examination of the kinds of items traded for in historic and prehistoric times in the Great Basin may provide us with a model with which to determine the kinds of artifacts likely to have been traded.

   a. If all the Fremont artifacts fit within this category of possible trade items, then we must assume that the two groups were at one time trading partners. Therefore, we must either move up the date for the Fremont extinction in Utah, or move down the date of the Numic spread into Idaho.

3. If the Shoshone opportunistically scavenged artifacts in the Utah Fremont area, one would expect to see small numbers of unusual kinds of artifacts that did not fit into the material culture of the Shoshone. We would also have to extend the geograpahic range of Idaho Shoshoni into Utah, perhaps on a seasonal basis.

4. Attempt to ascertain if there is enough archaeological and ethnographic evidence to support the theory that the Shoshone are the descendants of the Fremont. If this link can be satisfactorily demonstrated, the Fremont must be accepted as the ancestors of the Shoshone.

5. Dates of Fremont occupations in stratified sites in Idaho are necessary to establish the temporal range of the Idaho Fremont. If a cultural continuity can be demonstrated between the Archaic populations of southern Idaho and the Fremont, it is possible the Idaho Fremont group is another geographic variant that evolved in situ from a preexisting Archaic population.

If I can demonstrate, therefore, that our archaeological classifications are correct, that the Idaho Shoshone and Utah Fremont were never in physical contact with each other, that the Idaho Shoshone settlement pattern did not encompass Utah, and finally that the Fremont were not the ancestors of the Shoshone; then the Fremont artifacts in the P/W collections are the direct result of a Fremont occupation of Wilson Butte Cave.

A LITERATURE REVIEW OF THE "FREMONT PROBLEM"

The archaeological community holds many different views as to where the Fremont originally came from, how and where they subsisted, and why they eventually disappeared. This chapter attempts to outline a few of the major theories presented by Fremont researchers over the past 50 years of investigation, in order better to understand the vagueness of Fremont definition, and, the lack of agreement on almost every aspect of the Fremont manifestation.

Kidder (1924), was the first to notice the presence of a distinct archaeological group in Utah. He considered it to be "peripheral" to the Anasazi, (an agricultural-based group farther to the south), due to some of the architectural and artifact assemblage similarities. In 1931, while doing work along the Fremont River in southern Utah, Morss (1931) also noted archaeological sites that were subtly different from any sites seen in Arizona. Steward (1931), in his excavation reports from Kanosh and Meadow in Millard County, also noticed these "different" sites; and like Kidder, thought them to be a peripheral Anasazi group, and assigned them the name "puebloid." After a few more years of archaeological investigation, there was enough artifact and pottery analysis to support the idea of a distinct cultural group, perhaps descendant from but independent of the Anasazi. Morss named them the "Fremont," after the river where he first discovered the sites (Gunnerson 1960:373). Today this is their generally accepted name; but there have been, and still are other names associated with the Fremont.

The Fremont culture is recognized by the presence of specific features and artifacts confined to the modern-day boundaries of Utah and adjacent states in the Great Basin. There is however; a considerable range of variation in the kinds of artifacts found between sites throughout the Fremont area. This lack of homogeneity within the Fremont cultural assemblage has initiated a debate concerning the definition of the Fremont as one group. As with many disciplines, there are "lumpers and splitters" within the group of Fremont researchers. The various names of the Fremont will be dealt with in the section on Fremont variants. It is important at this point, however; to present a few of the various theories concerning the origins of the Fremont. Each researcher's theory concerning where they came from contributes to understanding how they came to be classified into their various regional groups, with their various names.

A. FREMONT ORIGINS

As with every other aspect of the Fremont, their origin is a topic of considerable debate. The two major schools of thought contend that they either migrated north into Utah from the Anasazi area, or that they were an in situ development from the local Desert Archaic culture. The first archeological evidence of a "classically" Fremont presence appeared in southern Utah around 400 - 700 A.D. (Marwitt 1986:161). There is a general pattern for an earlier development of Fremont in southern as compared to northern Utah. There could only be two possible explanations for the origin of the Fremont; that is:

1. An influx of people from outside the Fremont region with the Fremont traits already developed.
2. An influx of ideas from another region, stimulating change in the material culture of the indigenous population.

Michael Berry (1980) seems to think that there are more than two options in the origin problem. He suggests independent invention as a reasonable explanation for the appearance of the Fremont culture, stating that the indigenous population developed agriculture and irrigation regardless of outside influences. I disagree with this theory, due to the proximity of the Anasazi and the magnitude of Fremont items of obvious Anasazi origin. There has always been a strong visual and technological correlation between Fremont material culture and that of their southern Anasazi neighbours (Aikens 1976; Holmer 1980; Madsen 1980, 1982).

The in situ hypothesis for a Fremont origin supports the idea that the local Archaic peoples developed into the Fremont. In this hypothesis, the hunter-gatherers known as the Desert Archaic occupied the general limits of modern-day Utah from as early as 8000 B.C. until A.D. 500 - 700, when, due to technological innovations introduced from the Anasazi, they developed into the Fremont (Berry 1980:17). Many Fremont researchers agree with Berry's theory that the indigenous people selected, modified, and blended traits from the Anasazi Basketmaker people with their own in the early Pueblo periods (Marwitt 1986:161; Jennings et al 1956:103; Rudy 1953:167; Taylor 1957:146-7; Wormington 1955:176-8; Husted & Mallory 1967:229; Jennings & Norbeck 1955:6).

These researchers believe that the probable stimulus for this cultural change was the introduction of a new strain of hardy maize called "Fremont Dent." Fremont Dent is well suited to the extremes of climate, drought, and the short growing season of Utah. The introduction of a more reliable source of food offered the people the means to grow and store food surpluses. Their settlement pattern changed from nomadic to semi-permanent, since they now had to spend a certain amount of time planting, irrigating, and harvesting their crops. The surplus of food introduced the ability to have some people devote more time to crafts, and social and religious activities, producing a more diverse and sophisticated material culture . Maize horticulture did not, however, replace hunting and gathering, since the aridity of Utah still limited the amount of maize that could be grown. This flexibility in their subsistence strategy was the essential difference between the Fremont and the Anasazi, the Anasazi being almost entirely horticulturist.

In the Fremont subsistence strategy, hunting and gathering were as important as horticulture. They would depend on one resource or another, depending on the time of the year or the success of their harvests. Due to the Fremont people's heavy dependence on wild resources, it is more conceivable that they incorporated horticulture into their subsistence strategy rather than adopting hunting and gathering. It seems most reasonable, given the evidence, that the Fremont developed from a Desert Archaic group of people already in Utah, due to innovations introduced by the Anasazi to the south.

Diagnostic Fremont elements such as hide moccasins, one-rod-and bundle basketry, incised stone tablets, and anthropomorphic figurines all appeared in the pre-Fremont (Archaic) context in Utah well before A.D. 400. In some cases they appear as early as 2500 B.C. (Aikens 1970,1972). Marwitt (1986:163) believes that there is sufficient proof to support the theory of an in situ development due to the degree of Archaic-Fremont cultural continuity. There are certain researchers however, who would beg to differ.

Madsen and Berry (1975:391) suggest that there was a 2000 year hiatus between Archaic and Fremont occupations at lake-periphery sites in the northeastern Great Basin. However, Hogup Cave illustrates a smooth transition between Archaic and Fremont in A.D. 400, when pottery, maize and bone pendants are simply added to the Archaic assemblage "without replacement or marked cultural discontinuity" (Marwitt 1986:163).

Steward (1937:86) and Aikens (1966) have suggested an Athapascan origin of the Fremont, who entered from the north circa. A.D. 500; and adopted and modified Pueblo ceramics, horticulture, and architecture. There is little archaeological evidence, however, to support this hypothesis.

Having considered all the arguments, I believe that the Fremont developed <u>in situ</u> from an Archaic group which adopted a new subsistence strategy, maize horticulture, and supplemented it with wild resources. I believe the Fremont people would not have limited their options by limiting the sources of external influence to improve upon their subsistence strategy. The range of differenciation between geographical Fremont variants is probably due in part to the mixture of Fremont traits with those of their immediate neighbours as well as ecological differences. Perhaps that is why the southern variants resemble the Anasazi so closely, due to the similarity in ecology; and the northern Fremont, like the people occupying the Great Plains to the east, for the same reasons. The Fremont people seem to be masters of adaptation in an environmentally severe region of the Great Basin; the very fact that they survived in this area for a millennium is a testimony of their technological flexibility.

B. MATERIAL CULTURE

Gunnerson (1969) divided the Fremont into three regional variants by grouping similarities in material culture, subsistence strategies, and geographic location. He named these variants the Virgin, the Fremont, and the Sevier. He considered the Virgin as a branch of the Kayenta Anasazi, who were centered in the lower Virgin River drainage in southern Nevada (Fowler & Madsen 1986:175; Madsen & Lindsay 1977). He believed the Virgin were the ancestors of the Utes, because they demonstrated the most Anasazi influence in their material culture. Gunnerson viewed the Fremont and Sevier as northern expansions of the Virgin variant. His classification of the Fremont into these three groups is dependent on his assumption that they had their origin in the south, with the Anasazi as their direct ancestors.

Julian Steward (1940) failed to recognize the Fremont as a significantly different culture, and considered it to be only the "Northern Periphery" of the Anasazi. He subdivided this northern periphery into: "The Sevier Desert Region Pueblo" and the "Upper Colorado Plateau Pueblo," the "Sevier" being in the eastern Great Basin and the "Colorado" on the Colorado Plateau within the state of Utah (Berry 1980:18-19). It is assumed that this classification was made on the basis of variation in the Fremont artifact assemblages.

Another name associated with the Fremont in the literature is "Promontory" a name derived from the Promontory Cave Fremont site in northern Utah. This site was described as being a separate Fremont group on the basis of its pottery (Wormington 1955). Therefore; the names Northern Periphery, Sevier, Virgin, Promontory, and Fremont have all been used; and are occasionally still used to label parts of a cultural group holistically termed the Fremont. For the purposes of this thesis I will use the term Fremont to include all the regional variants of a group defined as:

> "An extensive and unique horticultural pattern developed during a brief period between about A.D. 500 and 1400. Regional variants of this culture... existed north of the Colorado River in western Colorado, Utah and eastern Nevada, characterized not only by horticulture but also by housing of adobe or masonry, distinctive pottery and basketry types and other features unique in the region" (D'Azevedo 1986:8).

As demonstrated by the number of names used in association with the Fremont, not all Fremont sites have the same material culture from one region to another. Marwitt (1970) found that Fremont sites with similar artifacts and features (which make up a trait list) could be grouped within five geographic regions. He based the definition of these regional variants on not only complex trait lists, but the lack of traits and regional chronologies (Marwitt 1970). Various other researchers have added or subtracted from this list of five regional variants (Ambler 1966, 1967, 1970; Aikens 1965, 1966; D. Fowler 1970; Fry 1970; Gunnerson 1969; and Sharrock 1970). Due to the lack of homogeneity, Madsen and Lindsay (1977) and Lindsay and Sargent (1979) have even rejected the idea of a Fremont culture altogether; and have proposed their own cultural units based not on specific trait lists but rather on subsistence patterns (Nielson 1978:27).

Hogan and Sebastian (1980:15-16) have pointed out some of the drawbacks of classifying Fremont variants mostly on the basis of trait lists. One of their criticisms is that differences in environment and subsequent settlement patterns have not been sufficiently taken into account. When one deals with a prehistoric culture, however, one must depend entirely on the material culture left by the people. These remains may not represent the entire cultural assemblage, but archaeologists must use the pieces to put together the most representative picture he/she can.

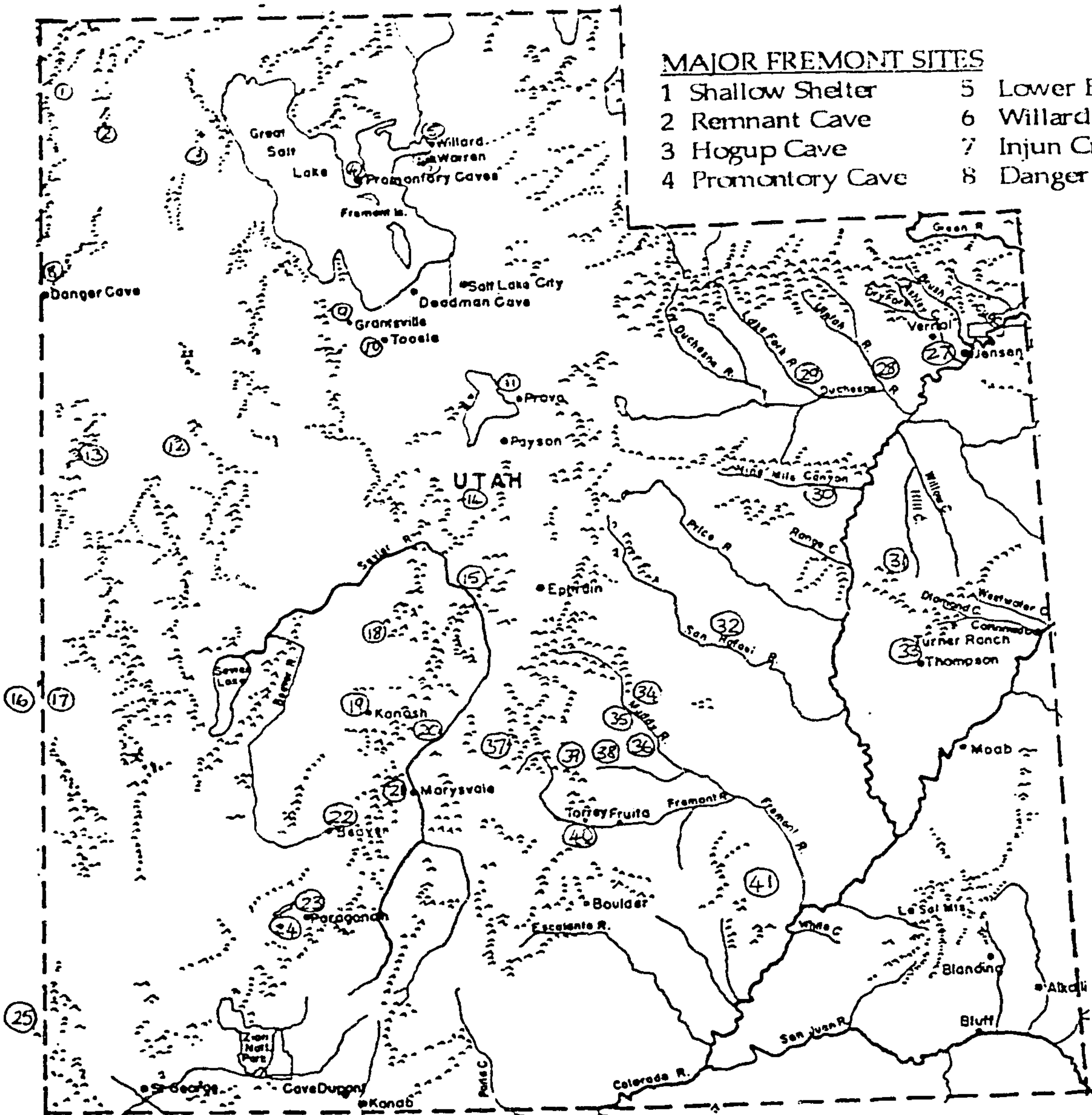
Marwitt defends his model by stating that "patterns of aboriginal land use have not been studied in detail and ecological districts are by no means coextensive with geographical limits proposed here for each cultural variant" (1970:138). However, as archaeologists, we must be careful when applying modern examples of land use to prehistoric groups. We have no idea of the cultural variables influencing the methods of subsistence. One cannot assume that the cultural conditions were the same in prehistoric times as they are in historic. If the ecological zones do not exactly correspond with the Fremont Variants zones, that is to be expected since man is not entirely affected by his environment; he, to some extent, affects his environment (Ibid.).

Using the trait lists of archaeological sites, and the geographic concentrations of these traits, Ma variant typology will be used to describe the Fremont. It is important to note that this classification is only for our convenience, and does not necessarily represent differences between groups perceived by the Fremont themselves. The trait lists are not considered to be a check list; the absence or presence of a specific artifact does not qualify or disqualify an archaeological site as one Fremont variant or another.

> "This does not imply that distinctive artifact clusters cannot be formulated but these aggregates should include a large number of artifact types possessed by most of the sites, with no single type necessary or sufficient for membership" (Hogan & Sebastian 1980:16).

C. FREMONT VARIANTS:

The Great Salt Lake, Sevier, and Parowan variants are restricted to the Basin province; and are basically subdivisions of the Sevier group as defined by Madsen and Lindsay (1977). The other two variants, Uinta and San Rafael, are located east of the Wasatch Plateau (fig. 1.1); and are divisions of the previously-defined Fremont (Madsen & Lindsay 1977). Each variant has its own regional traditions and ecological adaptation, but all are linked by an overall similarity in general lifeways.



MAJOR FREMONT SITES

1 Shallow Shelter
2 Remnant Cave
3 Hogup Cave
4 Promontory Cave
5 Lower Bear River
6 Willard
7 Injun Creek
8 Danger Cave
9 Grantsville
10 Toole
11 Utah Lake Area Sites
12 Crab Cave
13 Scribble Rock Shelter
14 Nephi Mounds
15 Ephram
16 Amy's Shelter
17 Garrison
18 Pharo Village
19 Kanosh
20 Backhoe Village
21 Marysvale
22 Beaver
23 Paragonah
24 Median Village
Evans Mound
25 O'Malley Shelter
26 Yampa River Area Sites
27 Dinasaur National Monument Sites
28 Whiterock Village & Caldwell Village
29 Felter Hill, Flat Top Butte
30 Nine Mile Canyon
31 Hill Creek Area Sites
32 Windy Ridge Village & Power Pole Knoll
33 Turner-Look
34 Innocents Ridge
35 Clyde's Cavern
36 Pint-Sized Shelter
37 Nawthis Village
38 Snake Rock
39 Old Woman
40 Fremont River Sites
41 Bull Creek Sites

Fig. 1.1 THE FREMONT REGION AND MAJOR SITES
(From Madsen 1980: fig. 1)

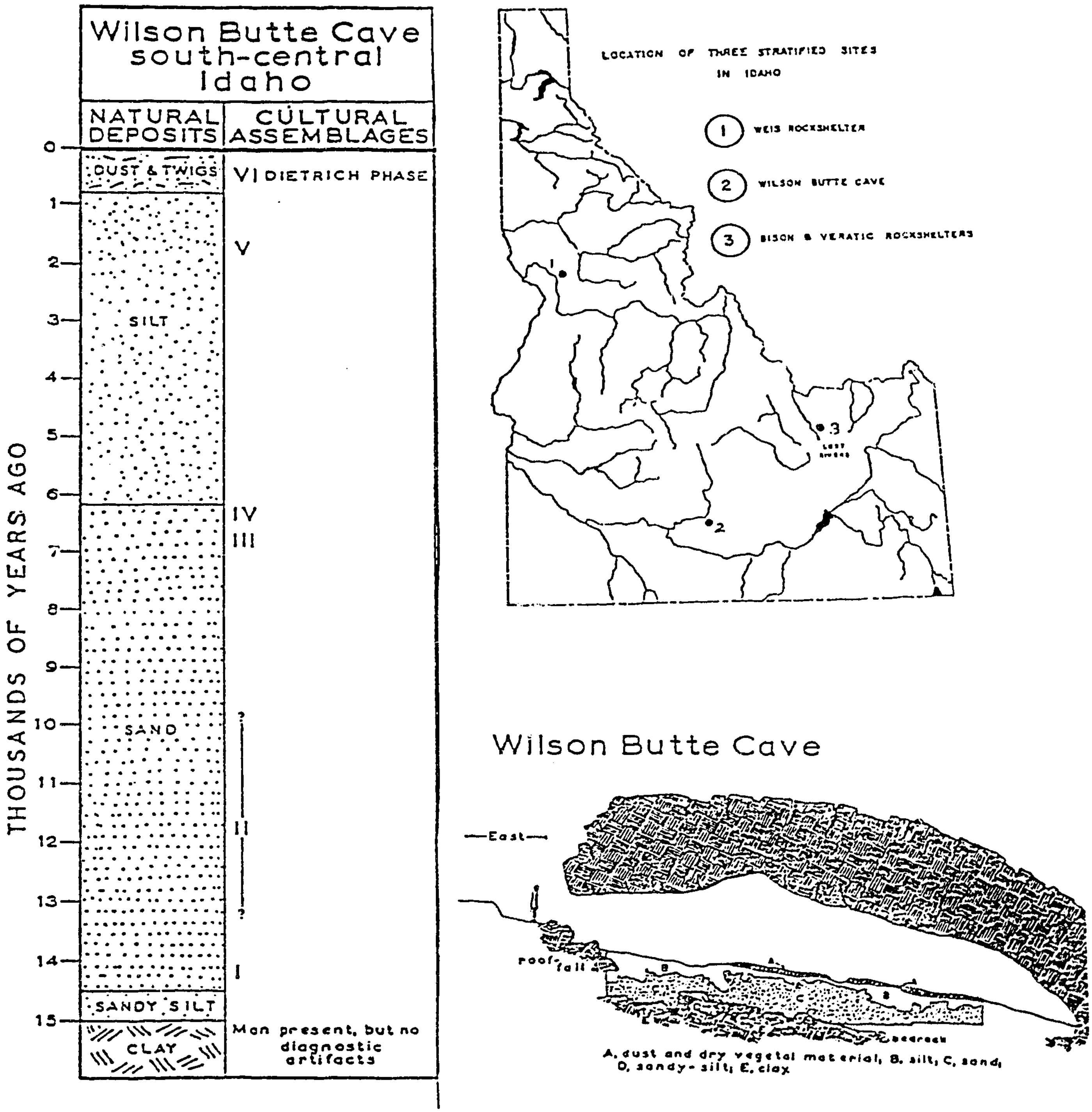


Fig. 1-2. Idaho and Wilson Butte Cave (adapted from Butler 1986: figs. 15 - 17).

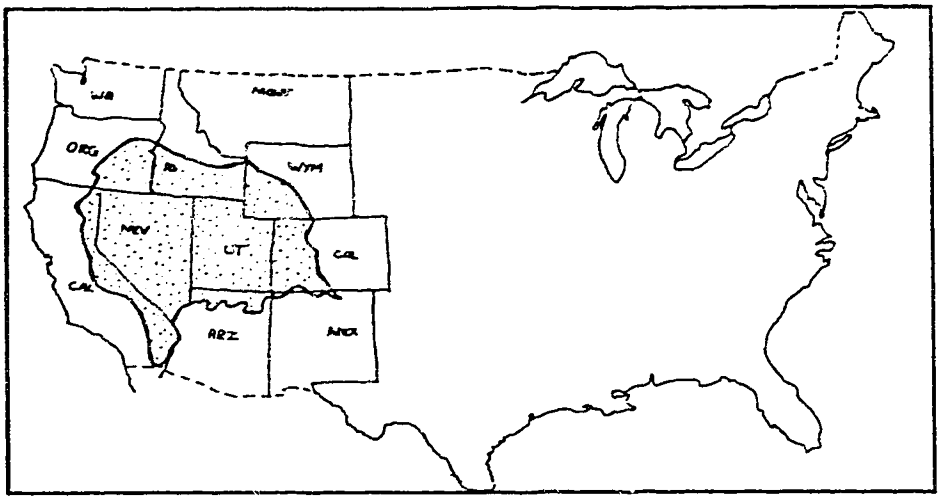


Fig. 1-3 The Cultural Great Basin (adapted from Wormington 155: fig. 1).

> "Together with continuity from a regionally differentiated Archaic and the relative degree of interaction with non-Fremont populations, the requirements of adaptation to the special ecological circumstances of each area contributed to the distinctiveness of the Fremont variants" (Marwitt 1986:164).

The general Fremont trait list was composed by Wormington in 1955 to facilitate the recognition of specifically Fremont manifestations. It is to be noted that the following is not a check list. There is a wide range of trait variation between and amongst Fremont groups, and the lack or presence of various traits does not include or preclude a site in the Fremont classification.

THE GENERAL FREMONT TRAIT LIST (Wormington 1955:173-6)

Economy:

The Fremont people were agriculturists as well as hunters and gatherers who grew corn, beans, and squash. Their maize is of a Mexican dent type, called Fremont dent (a drought-resistant maize). They were dependent on hunting to a greater extent than is usual for agriculturists in the Great Basin. Mountain sheep, deer and buffalo were among the big game most commonly hunted. Fish hooks in Castle Park and the Fremont Valley suggest some dependence on fishing. There was also an unusually high dependency on wild plant products such as seeds, bulbs, and nuts. There appears to have been some utilization of insects for food. Wild plant fibers and cedar bark were commonly used materials.

Structures:
Storage chambers:
Pot holes and cysts were used wherever conditions permitted. Cysts sometimes had wattle work partitions. Granaries with vaulted walls of horizontal masonry were characteristic of many Fremont sites, particularly in the north. They were roofed with poles and adobe and covered with stones. Only one masonry granary was found in the Fremont drainage, and there was one adobe granary with canted walls. There were no masonry granaries at the Turner-Look Site, but there the houses were enlarged versions of these structures. One storage chamber was made of adobe turtlebacks.
Houses:
There is variation in different localities and in different periods. The presence or absence of caves probably played a major role in determining the type of house which was built. Castle Park, Fremont Drainage, Uinta Basin: lean-tos of poles covered with cedar bark. At Book Cliffs and Nine Mile Canyon (caves), circular, and oval houses of horizontal masonry were built. Surface structures: vaulted walls, lintelled doorways in some cases, no side entrance in others, they were probably roofed with poles and adobe overlaid with stones. Brush Creek: Surface houses with foundations of river boulders; the same type may be represented in the Fremont Drainage.
Fireplaces:
Usually adobe rimmed. Sometimes outlined with cobbles or slabs. In houses and in outdoor living areas.
Miscellaneous Structures:
Large building with 15 fireplaces, at the Turner-Look Site. Earthen platforms in the Fremont Drainage, one with a hearth on top.
Dry Laid Masonry Structures:
Circular and oval. 5 to 35 ft in diameter. Floors often paved with stones. Artifacts absent or extremely rare. These do not appear to have been used as houses, forts, or lookouts, and it is possible that they had some ceremonial significance.
Clothing and Ornaments:
There is good evidence of the use of hide moccasins with dew claw hobnails, and it is probable that various garments were made of hide. Some fur cloth and some twined woven and twilled materials were available for use in making of clothing. Headdresses of feathers and of deerskin have been found, and pictographs show headdresses apparently made of horns. Figurines suggest that women wore aprons and men kilts, and that both wore belts and necklaces with pear-shaped and discoidal elements (probably elk teeth). Elaborate necklaces are also shown in pictographs. Marks above and below the eyes on pictographs and figurines may indicate face painting or tattooing.
Pottery:
Plain gray to black was most characteristic. Both rough and smooth finishes were used. Most common forms were wide-mouthed jars with rim-to-body handles with rounded bottoms; some had doubly-recurved necks. There was occasional use of clay appliqué for decoration. Bells with scoring and embossing

have been found only in the Fremont Drainage. There were regional and temporal variations in tempering: Calcite temper- Castle Park, Blue Mountain, Douglas Creek, Uinta Basin, Nine Mile Canyon, Turner-Look Site, La Sal Mountains. Gray Siltstone Temper: Turner-Look Site, Nine Mile Canyon, Range Creek. Black Igneous Rock Temper-Nine Mile Canyon, Range Creek, Fremont Drainage.

Corrugated:

Nine Mile Canyon, Turner-Look Site, Fremont Drainage, La Sal Mountains. Very few sherds reported from Uinta Basin, one from Range Creek.

Painted Wares:

Black-on-gray, Nine Mile Canyon. Probably made locally. Black-on-white and Black-on-red Turner-Look Site, trade wares, Northern Arizona and Mesa Verde area types. Fremont Drainage, probably trade wares.

Figurines:

Most were anthropomorphic, but some zoomorphic types were made in the Castle Park area. They were usually decorated with clay appliqué and paint. The most elaborate forms and the greatest number have been found in the Fremont and Range Creek drainages.

Pipes:

Tubular forms of stone were the usual type. One elbow type of pottery pipe was found at the Turner-Look Site.

Basketry:

Coiled. Split-rod and bundle foundation, interlocked stitches, and spilt-rod foundation with interlocked stitches most common. Specimens found at the Turner-Look Site and in the Uinta Basin were waterproofed with gilsonite.

Matting:

Twined woven. Tule was commonly used.

Cedar Bark Bags and Blankets:

Twined woven. The dead were wrapped in cedar bark blankets.

Tools and Implements:

Chopping and Pounding Tools:

Hammer stones, heavy cylindrical objects which may be ungrooved mauls.

Projectile points:

Occur in larger numbers than in Anasazi sites. Corner-notched or triangular in most areas. Corner-notched, triangular and side-notched points found at the Turner-Look Site and at Nine Mile Canyon. Some points made from curved flakes.

Knives: Bi-facial. Leaf-shaped, oval, and asymmetrical.

Scrapers: Scarce, crude.

Drills: Expanded base most common. Some straight shafted. Some made from reworked points.

Grinding Stones: Troughed, rimmed, and basin type metates. Small one hand manos, rectangular or oval.

Bone Tools: Many awls, all types. Splinter type predominates, but deer metapodials commonly used. Notched ribs and scapulae.

Gaming Pieces:

Bone: rectangular, one face usually striated and colored with hematite, some carved designs. Stone and pottery, circular and oval.
Stone Balls:
Smooth. Two to 4 inches in diameter. Matching holes in rocks may have been used in playing a game.
Pictographs and Petroglyphs:
Trapezoid bodied anthropomorphs commonly seen. These anthropomorphs often had curved projections from their head which resemble horns or antennas. They also had decorations on their chest with outspread fingers, some can also carry bows. Some figures have crown-like headdresses reminiscent of feather headgear found in Castle Park and the Fremont drainage area. Human figures often carry large circular or oval shields with designs. Animals are often mountain sheep or deer.

As Fremont traits differ according to region and resources, it is important to show that range of variation in order to demonstrate how one group of people can retain a group identity but be so diversified. This fact is important in order to consider how different an Idaho Fremont variant might be compared to its closest neighbour.

D. TRAIT LISTS OF EACH FREMONT VARIANT

1. PAROWAN FREMONT: A.D. 900 - 1250 A.D. (Marwitt 1986:165-6)

WHERE: Centered in the Parowan Valley of Southwestern Utah (illus. 1-3).
SETTLEMENTS: Quite large settlements, closely spaced pit houses and adobe storage structures, which were occupied for up to 100-200 year spans. They were located on floors of alluvial valleys near perennial streams; the water was used for irrigation.
ECONOMY: Maize horticulture, supplemented to an important extent by hunting and gathering of wild plants and animals.
DISTINCTIVE TRAITS: Both circular and quadrilateral pit dwellings
POTTERY: decorated and undecorated bowls and jars, assigned to the sand-tempered Snake Valley Grayware series.
POINTS: Basally notched Parowan points
MISC: Flaked bone scrapers, lateral metapodial awls, and bone finger awls.

2. SEVIER FREMONT Late 9 th century - mid 1300 A.D.

WHERE: Central-western Utah and adjacent portions of eastern Nevada.
SETTLEMENTS: Small hamlet or open settlement on alluvial fans near canyon mouth and convenient to a dependable source of water (a perennial stream).

Tend to be relatively close to marshes. There are a few pit dwellings and associated adobe storage structures.
ECONOMY: Mixed, horticulture and hunting and gathering.
DISTINCTIVE TRAITS: This variant is the least typologically cohesive of all the Fremont regional expressions. Flaked and ground stone tools are heterogeneous. The only distinctive artifact is basalt-tempered Sevier Gray pottery.

3. GREAT SALT LAKE FREMONT A.D. 400 - 1350 A.D.

WHERE: Centered in the region of the Great Salt Lake in northern Utah.
SETTLEMENT: Generally lacks substantial dwellings. Stone masonry architecture is absent. At Bear River (Fry & Dalley 1979) there are temporary hunting camps and shallow, semi-permanent structures. The only storage device is a pit.
ECONOMY: Almost entirely based on hunting and gathering, especially from marsh environments. The soil is too saline for maize agriculture.
DISTINCTIVE TRAITS: Cylindrical ground stone pestles, slate knives, etched stone tablets. Side-notched projectile points tend to be from northwestern Utah. Knives or saws made of deer and mountain sheep scapulae, bone whistles, and harpoon heads tend to be restricted to the Great Salt Lake variant.
POTTERY: A sand-tempered gray-ware (Great Salt Lake Gray) and Promontory Ware: tempered with coarse calcite fragments and made by the paddle-and-anvil method instead of the coil-and-scrape method of manufacture.
PROJECTILE POINTS: Rosespring points (a late archaic date) dominate in these sites.

Steward (1940:472) also referred to this regional variant as "Northern Periphery", and included these artifacts on the distinctive trait list: The Fremont hide moccasin, hide shields, pecked stone balls, small rectangular gaming bones, a remarkable elaboration of anthropomorphic petroglyphs, pictographs, and unbaked clay figurines, the "Utah metate", and such ceramic traits as stuck-on or punched (false corrugated) decoration.

4. UINTA FREMONT A.D. 650-950 (Marwitt 1986:169)

WHERE: The Uinta basin of northeastern Utah.
SETTLEMENT: Small hamlets or rancherias with no more than five or so shallow, circular pit houses occupied at any time; cultural deposits are thin, suggesting a brief occupation, or seasonal occupations. Surface storage is absent at open habitation sites, although storage pits are present. Small masonry granaries are occasionally constructed on rock ledges. Habitation sites are generally located on knolls or buttes, or on hill slopes above creek flood plains.
ECONOMY: Maize horticulture is present but not as important as hunting and gathering.

DISTINCTIVE TRAITS: There is an absence of Utah type metate and the anthropomorphic figurine complex.
POTTERY: Uinta Gray; calcite tempered grayware. It is the only locally manufactured pottery.

5. SAN RAFAEL FREMONT A.D. 700 - 1250 (Madsen 1975; Jennings and Sammons-Lohse 1981)

WHERE: Centered east of the Wasatch Plateau
SETTLEMENTS: Quite small, consisting of rancherias with a few pit houses and associated storage structures, wet-laid and dry-laid masonry dwellings and granaries also found. Permanent villages on low ridges or knolls near water and arable land. There are a few complexes of multi-room masonry structures resembling Anasazi unit pueblos (from Nine Mile Canyon). There are also temporary shelters in caves, niches, rockshelters (mostly for storage). Small dome-shaped masonry granaries constructed in protected locations, and small niches and recesses were sometimes walled off for storage.
ECONOMY: Cultigens, especially maize, were the crucial factor that permitted sedentary village life in the region (Madsen & Lindsay 1977). There are no marshlands on the Colorado Plateau.
DISTINCTIVE TRAITS: Extensive use of stone masonry, also plastered interior walls and slab-floor firepits.
POTTERY: Emery Gray, tempered with crushed igneous rock. Painted: Ivie Creek Black-on-white and intrusive (but Fremont) Snake Valley Black on gray. Anasazi trade pottery from the Mesa Verde and Kayenta areas is much more common than in any other part of the Fremont area.
PROJECTILE POINTS: Bull Creek projectile points.

Going back to the questions raised in the introduction as to whether or not Fremont material culture can fit into the Shoshone range of material culture, it is necessary to compare the Fremont trait lists to the Shoshone trait list to determine whether or not these two groups could be easily confused at an archaeological site.

E. THE NORTHERN SHOSHONE TRAIT LIST (Lowie 1909:173-195) (ethnographic information)
Knives:
Sometimes a wooden or horn handle was attached, but was frequently missing.
Projectile Points:
The points were about 3/4 inch long, half an inch wide and rather thin. Those intended for hunting were widened so that the head might be withdrawn with the shaft, while arrows for war lacked this feature.

Scrapers:
Thin segments of quartzite. They were circular or oval, sharp-edged, convex on one-side and flat on the other.
Bone tools:
Awls, salmon-gigs, and sometimes the caches in the hand-games were made of bone. Beside antlers, sharpened ribs were used as scrapers in the preparation of hides.
Pottery:
Pots are in the form of a conical jar and are made of either earth or of a white soft stone. They also had kettles and water-jars with stoppers, which were used for holding fish, oil and grease.
Perishables:
Sagebrush bark was used for weaving baskets, bags, and blankets (blankets also made from cottontail and jackrabbit skins). Mats were manufactured from rushes.

Basketry:
Coiled baskets were made of long tough roots wound in plies around a center. The plies were held together by a small root passed through a space made by forcing an awl between the two last plies and winding the root under the last and over the one to be added in the process of formation.
Moccasins:
They were made of deer, elk, or buffalo skin dressed without hair, made from a single cut piece of hide, with a seam on the outer edge of the foot.
Beads:
In Lewis and Clark's time, only children wore beads about their necks. In 1909 they wore long necklaces of cylindrical beads (both men and women). These were preceded by ornaments of strung salmon-vertebrae, separated at a later period by intervening beads, or of small sea-shells obtained from neighbouring tribes. Elk-tooth necklaces were worn by women and children, while bear claw necklaces were the prerogative of men who had killed a grizzly.
Warfare: Bows & Arrows:
Two types of bows occurred. One is described as narrow, ovate in section, and sinew lined, the other (called a bighorn bow) consists of two parts spliced in the center with sturgeon glue and deer-sinew wound around the splice. The arrow shaft is 2 1/2 feet long, generally made of a shrub called "grease-bush". The arrow was unnotched; and was feathered for about five inches near its rear end, leaving just enough space for the marksman to pull it in drawing the bow. The arrow also seems to have been dipped in some dark-coloured fluid, which had dried on them.
Games:
The most popular games were dice-throwing and the hand-game. The hand game had two small bones, or sticks, about 3 inches long and tapering towards both extremities. one of them has sinew or a string wound about its thickened section, the other is plain. The dice-throwing game had four thin willow sticks,

convex on one side and flattened on the other with a groove in the center; they generally had some kind of markings (fig. 4- 2).

Artifacts specifically recognized as Shoshone are: small side and basally notched points (Desert Side-notched), small triangular points (un-notched), pottery (coarse, thick-walled, flowerpot-shaped), coiled basketry of one-rod foundation, gaming sticks, rabbit fur blankets, and tubular pipes. In Gruhn's report on Wilson Butte Cave, she notes that the Dietrich phase assemblage does lack items intimately associated with Shoshonean peoples, most notably twined or coiled basketry, rabbit fur or bird skin blankets, and food grinding implements. She states that "this absence is difficult to explain" (1961:143).

F. FREMONT SUBSISTENCE STRATEGY

Subsistence patterns are the complex of equipment and behavior involved in obtaining food and water (O'Connell and Hayward 1972:27). Holmer and Weder (1980) describe the Fremont as having an eclectic nature, borrowing equipment and behavior from surrounding groups to improve upon their subsistence strategy. They incorporated horticulture into their hunting and gathering strategy in order to live in an environment in which neither strategy was feasible separately (Holmer & Weder 1980). This meant that the Fremont people were flexible, borrowing technology from both the Anasazi (and possibly the Great Plains groups) in order to subsist in an ecologically limiting environment. This also meant that separate Fremont groups had adapted to individual geographical areas in ways to exploit best the unique resources of that region. Their basic technology would be the same, but there would have been slight variation.

TECHNOLOGY:

One aspect of the Fremont's technology that might demonstrate the influences from other groups as well as within their group are projectile points.

Many researchers have depended on projectile points as cultural and temporal markers. I am using them in the context of discussing Fremont subsistence patterns, to illustrate some of the problems in constructing one holistic model for the entire cultural area. The Fremont people had adapted their technology to resources within their own geographic region, producing slight variations in point types. The Fremont people's tendency towards technological flexibility is important to keep in mind while attempting to define a Fremont technology in a geographic location like southern Idaho.

Taking into account the technological versatility of the Fremont, movement of this culture from Utah into Idaho would require adaptation to new ecological conditions. These factors would result in sites with projectile point assemblages slightly different from other Fremont variant assemblages found in Utah. These "different" assemblages could be misinterpreted as a component of the Shoshone material culture, rather than that of what I believe to be an Idaho Fremont variant.

In order to create a working model to reconstruct how Idaho Fremont technology might appear, it is necessary first to look at the Great Salt Lake variant, the nearest to Idaho. The Great Salt Lake is, I believe, the group that most likely was the source of diffusion or migration into Southern Idaho. This origin point would explain the lack of structural features and the economic dependence on wild resources of the group in Idaho.

When attempting to assign cultural affiliation to projectile points in southern Idaho, it is essential to define the characteristics of Shoshone and Fremont projectile points. According to some Great Basin researchers (Marwitt 1970:145; Elston & Buddy 1990:264; Fry 1970; Aikens 1970; Holmer 1980:37, fig 18 & 19, 1986:106-107; Husted & Mallory 1967:225) the Rosegate Series projectile point is considered to be the diagnostic Fremont point type. They are found in significant numbers in Great Salt Lake and other northern Fremont variant sites. The Desert Side-notched point is considered by many as the diagnostic Shoshone point type (Plew et al 1987:96; Butler 1983b:6). Therefore if the Fremont, contemporary with the Shoshoni, had occupied Wilson Butte Cave, one would expect to see a projectile point assemblage with a high concentration of Rosegate series point types, (perhaps with slight morphological variation), as well as a number of Desert Side-notched points that represent the Shoshone. This is exactly what I have found in the P/W collections projectile point assemblage.

The point types from the P/W collections and Wilson Butte Cave collections from the Dietrich phase demonstrate the presence of both Shoshone and Fremont bow and arrow (and possibly atlatl technology), exploiting bison, antelope, deer, or smaller animals found on the Snake River Plain. Wilson Butte Cave could have been an important hunting camp, as being one of the highest points on the horizon, it is easily located and provides a vantage point for spotting game.

NATURAL RESOURCES:

The kinds of resources exploited within the Fremont area depended on availability. To demonstrate the variations in subsistence patterns between Fremont groups, I have listed a number of sites describing the kinds of resources that were exploited there, as demonstrated by the faunal and floral remains.

SITE	SUBSISTENCE
Marysvale 7 (Gillin 1941)	Fauna: deer, antelope, bison and other small mammals. Flora: Corn husks.
Elsinore Site (Nielson 1978:48)	Fauna: Mule deer. Flora: wild plants predominant; corn, beans, and squash minimally represented.
Backhoe Village (Madsen & Lindsay 1977)	Fauna: Small mammals 87% of total assemblage. Flora: wild plants predominant. Corn, beans, and squash minimally represented.

Pharo Village (Marwitt 1968:5)	Fauna: Deer & rabbit 78% of assemblage, plus aquatic animals and birds. Flora: storage structures probably for wild resources (Madsen & Lindsay 1977:88).
Kanosh Site (Steward 1931, 1933b)	Seasonal exploitation of wild resources rather than horticulture.
Beaver Sites: Bradshaw & George Mounds (Judd 1926:23)	Reliance on horticulture (not demonstrated archaeologically).
Parowan - Paragonah Sites (Meighan et al 1956:20)	Primarily corn horticulturists, secondary reliance on wild flora and fauna (marsh environment).
Evans Mound & Median Village (Berry 1972, 1974; & Marwitt 1970)	(located within 2.2 km of each other) Flora: considerable presence of wild flora: corn pollen present in minute amounts. Bulrush pollen indicates an exploitation of marsh environments.
Ephram Sites (Neilson 1978:66-68)	Large numbers of marsh fauna; a total lack or any cultigens.

Neilson (1978:67) has attempted to summarize some of this information and notes that all the major Fremont sites are located on drainage channels or near riverine environments. Berry (1974) suggests that these locations have been culturally selected in order to take advantage of floodplain horticulture. Riverine locations also give access to a wide variety of ecozones for intensive hunting and gathering. The evidence from Backhoe Village, Evans Mound, and Pharo Village indicate extensive use of wetlands, marsh, sage brush and pinyon-juniper resources. Cultigens presumably supplemented the wild resources, and provided fall-back subsistence during years of wild harvest failure.

Based on pollen studies and faunal remains shown in the sites mentioned above, it has been demonstrated that Fremont generally had a higher dependency on hunting and gathering, rather than on horticulture. It follows, then, that a Fremont migration or diffusion into southern Idaho might not be recognized by the presence of irrigation, permanent village architecture,or cultigens. Although Wilson Butte Cave is not situated near a drainage channel, or riverine environment, it has been suggested (Gruhn: personal communication) that Wilson Butte Cave was occupied during late fall or early spring as a seasonal base for the exploitation of, bison, deer or antelope (faunal remains found in the cave).

G. THE DEMISE OF THE FREMONT

By A.D. 1250 - 1350, most of the Fremont had abandoned both the Great Basin and the Colorado Plateau provinces. There are several theories to explain this sudden cultural collapse in the Fremont area. The two main ones state that the Fremont were either forced out of their homeland by the climate or by the Numic expansion.

The most popular theory is that of cultures in competition. The Fremont abandonment of Utah was supposedly due to population pressure from the expansion of Numic-speaking people from the southeast corner of the Great Basin (Marwitt 1986:171). Whether the Fremont died out entirely or had enough sense or opportunity to migrate into another region is another issue. Some think they dispersed onto the Great Plains (Husted & Mallory 1967: Aikens 1986). Butler thinks they went north into southern Idaho (1982:15); and others are not sure where they went (Madsen 1975:82).

The hypotheses pointing to climatic rather than human pressure is supported by Rudy (1953); Taylor (1954); Gunnerson (1969); Swanson (1972:206-207), and Marwitt (1986). Marwitt suggests that:

> "Proto-Fremont hunters and gatherers adopted a number of southwestern culture traits including horticulture. But when a climatic change of some kind forced them to abandon farming, they simply returned to their ancient foraging lifeways and gradually lost their derived Anasazi elements, thus obscuring the evidence of their former identity with the Fremont" (1986:171).

Young and Bettinger (1992:95) agree with both theories. They believe that the Fremont were in the process of disintegrating due to climatic factors just as the Numic spread was getting underway. They believe that the climatic change was the most significant contribution to the collapse and abandonment of Utah by the Fremont. But climatic change in the area would not have affected all variants in different areas in the same way; in fact, some may not have been affected while other would have been devastated.

Some researchers believe that there is evidence for culture continuity between the prehistoric Fremont culture and the historic Numic speakers (Rudy 1953 and, Gunnerson 1969). However, the major opinion is that there was no continuity between the two cultures. Linguistic evidence suggests that the Numic languages diverged from a common ancestor about 1000 y.a. (Miller 1966; Miller, et al. 1971; C.S. Fowler 1972; Lamb 1958). According to the linguistic evidence, the Numic expansion into the eastern Great Basin began only a few years before A.D. 1,000, rather than the A.D. 400-500 that would have been necessary for the Fremont people to have been ancestral Shoshone and Paiute.

Both Ambler (1980:72) and Lindsay (1986:247-8) believe that the current view of Fremont abandonment is too simplistic. I agree with Lindsay's statement that "it seems more realistic to discuss the fragmentation of Fremont society, recognizing that a somewhat abrupt change occurred but a change that resulted in a variety of adaptations over much of the Fremont area" (1986:248) It is my opinion that there was a complex of factors involved in events leading to the demise of the Fremont, and that the changes occurring at the time would have had different effects on different variants. This variability is demonstrated by the lack of consistency for terminal dates of the Fremont variants throughout Utah.

I hypothesize that a migration of a Great Salt Lake Variant people, or a diffusion of Fremont technology from that area, occurred sometime between 400 A.D. and 1350 A.D., from northern Utah to southern Idaho. There would have been a slight change in subsistence strategies and settlement patterns to accommodate a desert/plateau rather than a marsh environment.

METHODOLOGY

I will attempt to answer the questions presented in the Introduction with the analysis of two private collections of Wilson Butte Cave Stratum A which were made in the late 1950s by Mr. Wayne Perron of Dietrich and Mr. Smoky Webb of Shoshone Idaho. These two collections represent the span of time called the Dietrich phase (Gruhn 1961), which is within the time frame of a possible Fremont and subsequent Shoshone migration into southern Idaho. In the spring of 1991 I contacted both collectors.

Webb, who had originally found the cave; and had later directed Dr. Alan Bryan to it. Before reporting the cave, however, Perron and Webb undertook amateur excavations, shoveling and screening much of the top 1 - 1.5 meters of the cave deposits. As well as Perron and Webb, other amateur collectors dug during this time period, but to a much smaller extent. Ruth Gruhn was the first professional archaeologist to excavate in the cave, during the summers of 1959 and 1960. She had been told about the presence of this cave by Alan Bryan, and undertook research there for her Ph.D dissertation at Harvard.

Bryan and Gruhn both visited Perron before Gruhn's excavations in order to view his collection (Gruhn 1961); however, no records or analysis of the material was done. Webb's collection was never seen by Gruhn or Bryan, although his collection is comparable in size to Perron's (at least 200-300 finished artifacts).

Over the years, due to strained relations between the archaeologists at the Bureau of Land Management and the private collectors (collecting on public land is illegal), access to private collections was not sought and analysis never done. It was not known how many people excavated at Wilson Butte Cave, or how much material was removed from the site before Gruhn excavated there; but the number of finished artifacts from the Perron and Webb collections are more than double the number of artifacts collected by Gruhn from stratum A in the four seasons she has excavated there. It is apparent that these private collections represent a significant portion of the artifact assemblage of the site, and its analysis is a large contribution to the further understanding of the people who occupied the cave and what they did.

When Perron and Webb were excavating the cave in 1958, they divided the artifacts by alternatively giving each other the pick of "good ones" as they were recovered; consequently they collected an equal quantity of finished artifacts. Perron immediately curated his artifacts by washing them and putting a number "2" on each and every one of them. The numbers specified the locations of his assemblages, Wilson Butte Cave being the second site Perron had ever excavated. The fact that the artifacts were immediately curated provides sufficient confidence that the artifacts shown to me by Perron were actually from Wilson Butte Cave. Perron stored his artifacts in glass-covered, cotton wool-lined drawers in a display cabinet, in a display case, in shoe boxes and in picture frames. All were carefully cared for and preserved.

Webb curated his artifacts by washing them and immediately putting them in cotton-lined cigar boxes, and in picture frames, in a coffee table. Once the "good points" were taken from the assemblage, the cigar boxes were sealed and put in the basement, untouched for thirty years. Each box had "Wilson Butte Cave" written on it. Since the artifacts were never mixed with any others, I am convinced of their reliability as Wilson Butte Cave artifacts. The "best" Webb projectile points were arranged in picture frames and in a coffee table. They were lacquered in nail polish (to make them shine), and stuck to a felt background. These points were not accessible to me, since it would entail the destruction of the frames and the coffee table. The artifacts put in the cigar boxes, Webb told me, were not reopened since the day they were put there.

I worked on Perron's collection first. I did the analysis in a small room in which he kept his collections, just off of the living room in his home. The artifacts were never taken out of his home, since they were his private property. The artifact were numbered consecutively with Perron's prefix of 2. Webb's collections were assigned a prefix of 3, and consecutively numbered from 1. I weighed (using manual scales); and measured length, width, and thickness of all artifacts; I also drew by hand the dorsal profile and ventral views of each individual artifact. I photographed them and described them verbally in as much detail as possible. The classification of the artifacts was done out of the field, using either a key, like the one designed for projectile points by Thomas (1981), or by comparing them to collections from other sites. Artifacts that did not fit into a classification system or were not comparable to any other artifacts were assigned their own classification. The following are the results of the analysis and classification of artifacts in the P/W collections from Wilson Butte Cave.

CHAPTER 2: PROJECTILE POINTS

Introduction

The classification of projectile points into types is an important step towards assigning cultural affiliation and/or chronological placement to occupations of an archaeological site. The analysis of projectile points from the P/W collections, as well as Gruhn's Wilson Butte Cave assemblages, has led to the identification of the Shoshone and the Fremont both as inhabitants of the cave during the Dietrich phase (fig. 1-2).

The points in the P/W collections were classified using a key developed by David Hurst Thomas (1981) to identify point types from the Monitor Valley region of central Nevada. Although Wilson Butte Cave is outside this region, the typology was considered general enough to benefit in the identification of projectile points from southern Idaho. In all, 159 of 169 projectile points from the Perron/Webb collections were classified using Thomas' system. However, since his system does not extend to cover the classification of unfinished projectile points, blanks and preforms will be dealt with separately.

A. TYPOLOGY

Before artifacts can be linked to an ethnic group, one must:

1. Decide which artifacts in an archaeological assemblage are likely to have stylistic elements that express ethnic affiliation (Jimenez 1986:3).
2. Decide whether or not stylistic attributes of certain artifacts are actually expressions of social group affiliation.

An ethnic group is defined as:

> A unit in space and personnel whose members carry out a number of highly constrained closely replicated behaviours concerned with boundary maintenance, group affiliation, and group identity, in order to set themselves off from members of similar such units (Wobst 1977:308).

One type of artifact that has long been considered to have the stylistic elements representing specific ethnic groups is the projectile point. Before the development of absolute dating techniques, archaeologists in the New World depended heavily on artifacts like points to define cultural boundaries within chronological ranges. The absolute dependence on one type of artifact to define a culture can be misleading. We know so little about why points took the forms they did, whether there were functional or stylistic reasons for notching a point a specific way, that we cannot create a people for every point type described. Point types are created in the minds of the archaeologist to facilitate the organization of assemblages; how we as archaeologists organize points into groups may not have been the same as the makers themselves. Taking this factor into account, it has been demonstrated, however, that a certain form of projectile point can be concentrated in a specific geographic region over a certain span of time. These concentrations may be related to a group of people's range of technological variation; and may help to define the boundaries, synchronically and diachronically, of an ethnic group. I am aware of the dangers of using a single element [illegible] as projectile points to assign cultural affiliation to a site. Therefore, projectile points are used here as only one line of evidence to support the argument for a Fremont presence at Wilson Butte Cave.

Explaining why differences between the forms of point types occur has been a subject of debate for a generation of archaeologists (Wiessner 1983; Wobst 1977; Binford 1967, 1986; Binford& Binford 1966; Hodder 1978, 1984). No agreement on this subject has yet been reached, but opinions do at least fall into basically only two camps of thought. The problem is which physical attributes of a tool are influenced by cultural style, and which are influenced purely by function. The researchers defending the functional side of the debate argue that the maker of a projectile point shapes it a certain way according to the purpose he has in mind for it (Binford & Binford 1966); whereas the style supporters argue that the maker produces a point a certain way according to how he was taught and according to how it should look, regardless of the purpose intended for it (Holmer & Weder 1980).

At present the generally-held opinion among archaeologists is that projectile point types are a product of both form and function; each society has specific functions for their different kinds of projectile points, but the physical expression of this point depends on the group's stylistic opinion of what that particular point should look like. This type of stylistic expression in functional items occurs in our own society. Lemonnier (1989) demonstrated that formal variation in functional items must fall within the mental template of what we consider to be reasonable limits. Lemonnier described a type of airplane, designed in the 1960s, that had its wings oriented to point into, instead of away from its line of direction. This design greatly improved the stability and fuel efficiency of the plane, but the style was never accepted by the public because it "didn't look right." The plane went out of production because it deviated too greatly from our mental template of airplanes.

I believe that projectile point technology is affected by both form and function. A tool will take on a specific shape according to its intended purpose, but there will be a range of variation in tool shape due to a group's mental template and the maker's individual expression of style.

Thomas' paper on the Monitor Valley points does not deal with the theories of form and function; but rather is concerned strictly with typology, which he mentions is offered without apology (1981:7). His classification system uses measurements of point attributes, using the data base of projectile points from Monitor Valley, Nevada. Thomas uses variations in notch and base morphology to make the distinction between point types. He considers the base of the point to be the most stable and reliable reflection of the maker's original intent, since the base is protected from direct impact damage and consequent retouch by its hafting. Conversely the blade area is considered to be the most susceptible to damage, due to the forces of impact during use.

Flenniken (1985) questions Thomas' basic assumption. While conducting experimental archaeology assessing the damage pattern of projectile points used during hunting, Flenniken found that 72.7% of his sample sustained damage to the basal region. He attempted to rejuvenate the damaged points in order to reuse them, and found that the basal portion of these points had to undergo major morphological changes. Tangs were removed or reduced in size; and if the damage was extreme, the base was also renotched (1985:266). What Flenniken probably failed to note was that he did not know the precise techniques used to haft prehistoric points, since a projectile point shaft and hafting end are made of perishable material (wood, sinew, and resin) and do not survive well in an archaeological site. Perhaps Flenniken's reconstruction of hafting techniques contributed to the damage of point types.

Flenniken also made the decision himself to reflake and reuse the points rather than make new ones. We can never know whether the prehistoric hunter considered it too much trouble to fix a point or not. We do have archaeological examples of retouched points (mainly along the blade), but we have many more broken and discarded points in the archaeological record. We can never know all of the complex aspects involved in making the decision whether or not to throw away or keep a point. It would depend on availability of raw materials, the time and ease in making a new point, and the process involved in hafting (whether it was always done at camp, what raw materials were needed, or whether the point had to be notched a specific way to be hafted to a specific shaft). Therefore, since the blade portion is the most common area of repair (since it can be repaired without unhafting) we cannot depend on it as a diagnostic attribute to define the maker's mental template. The base seems to be the most reliable attribute when it comes to retaining its original form as the maker intended.

Thomas' classification system has been adopted in an attempt to identify point types, and frequencies of these point types in the P/W collections, that would have some kind of cultural significance in order to define two separate ethnic groups using the same basic weapons, in the same temporal span, in the same geographical region. The following is a description of the way in which the attributes of the projectile points from the P/W collections were measured in order to classify them into point types using the Monitor Valley projectile point key.

B. METHODOLOGY

The Perron/Webb (P/W) collection of projectile points were measured using a series of standardized attributes (fig. 1). These measurements were developed by Thomas, and are discussed in further detail in his Monitor Valley report (Thomas 1971).

1. Distal Shoulder Angle - DSA (fig. 2-1,a)
   The Distal Shoulder Angle is that angle formed between the line (A) defined by the shoulder at the distal point of juncture and line (B) drawn perpendicular to the longitudinal axis (C) at the intersection of A and C. DSA ranges between 90 ° and 270 °. If points are asymmetrical, the smaller value of DSA is measured. DSA is recorded to the nearest 5 °.

2. Proximal Shoulder Angle - PSA (fig. 2-1, b)
   The Proximal Shoulder Angle is that angle formed between the line (D) defined by the proximal point of juncture and line (B) plotted perpendicular to the longitudinal axis at the intersection of C and D. PSA ranges between 0 ° and 270 °. If points are asymmetrical, the smaller value of PSA is measured. PSA is recorded to the nearest 5 °.

Shouldered - A point is termed shouldered if DSA and PSA can be measured. If these two angles do not apply, the point is termed unshouldered.

3. Basal Indentation Ratio - BIR (fig. 2-1, c)
   Basal Indentation Ratio is the ratio of the length of the longitudinal axis (LA) to the total length (LT) parallel to C; i.e., BIR = LA/LT. Basal Indentation Ratio ranges between 0 and about 0.90.

   Length -Width Ratio - L/W
   The Length - Width Ratio is the ratio of the total length (LT) parallel to the longitudinal axis to the maximum width (WM) perpendicular to E; i.e., Length - Width Ratio = LT/WM.

4. Maximum Width Position - MaxWpos (fig. 2-1, d)
   The Maximum Width Position is the percentage of the total length between the proximal end and the position of maximum width (100 LM/LT). Range is generally between O and about 90%.

5. Basal Width - Maximum Width - WB/WM (fig.2-1, e)
   The Basal Width - Maximum Width Ratio is the ratio of the width at the widest portion of the base (WB) to the maximum width (WM). Range is from 0 to about 0.90 (Thomas 1981:11,13).

Fig. 2-1 explains how these measurements led to the identification of projectile point type.

C. CLASSIFICATION

Monitor Valley, in central Nevada, is approximately 300 miles southwest of Wilson Butte Cave; but it shares most types of projectile points with southern Idaho. One of the important reasons why this system of classification was chosen to orgnize the Wilson Butte Cave projectile points is that consistency in using archaeological terminology is so important when comparing collections. If all the archaeologists of one region could agree on consistent methods of classification and naming, it would make the archaeological world a better place.

Thomas sorts his points using a standardized set of measurements. When these measurements are applied to a key (fig. 2-2), the point is objectively, and reproducibly assigned a name. Even though most of the Monitor Valley point types occur in southern Idaho, there are still some differences. The side-notched Rosegate point has been added to Thomas' typology, since these points fit every criteria for a Rosegate Corner-notched point except the position of its notches. Rosegate Side-notched points have been recognized by other archaeologists as a type found in southern Idaho (Plew et al 1987). The only other type to be added to the original Monitor Valley list is basally-notched Cottonwood Triangular point since it is considered to be significantly different to merit its own classification. This point appears to be finished and intentionally notched; but since it is the only specimen, it may be anomalous.

There are a total of 169 projectile points in the two private collections from Wilson Butte Cave. This number represents only those projectile points that were accessible for examination, not those in Webb's display frames or coffee table (possibly 250-300 points). All but 47 from the Perron collection were analyzed (as they were not located by Perron during the time I was in Idaho). Almost all of the points are unbroken or in reasonably good condition as a result of the collectors' bias to collect only those points in good condition.

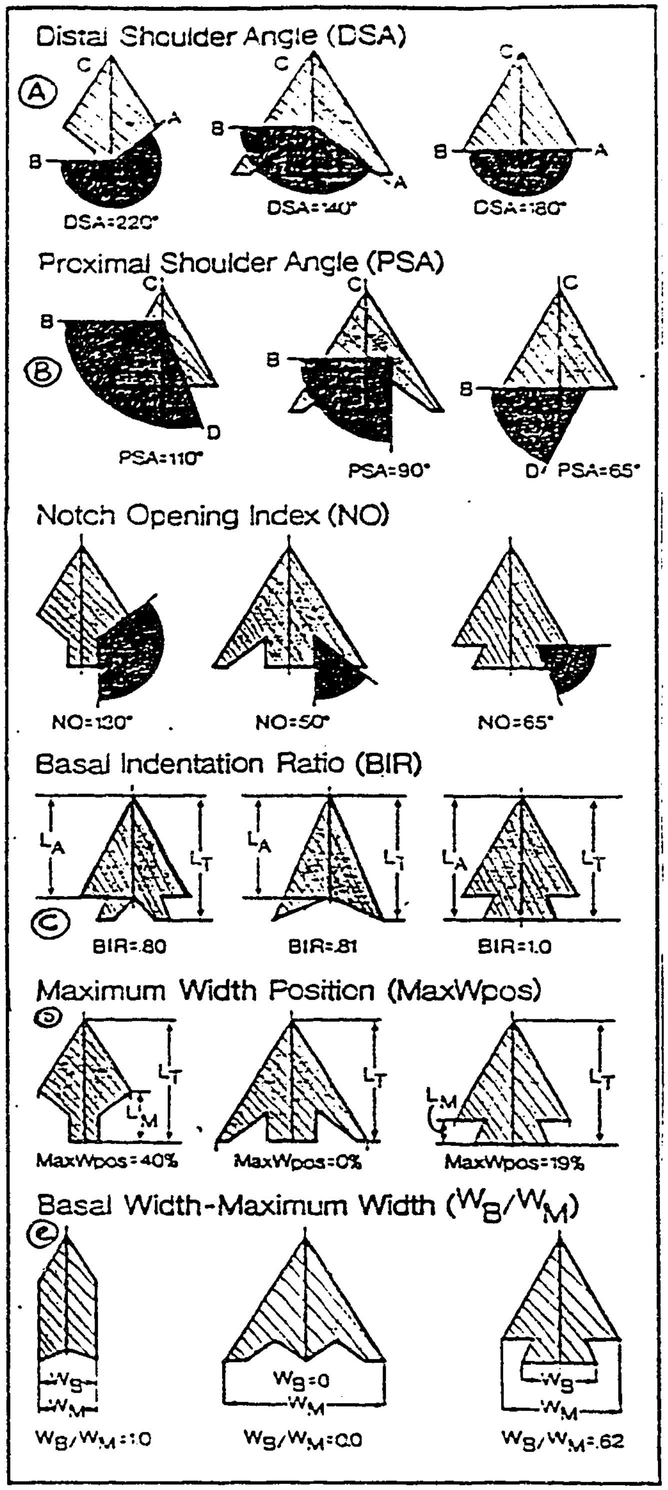


Fig. 2-1 Measurements for the classification of projectile points (adapted from Thomas 1970: fig 2 & 3)

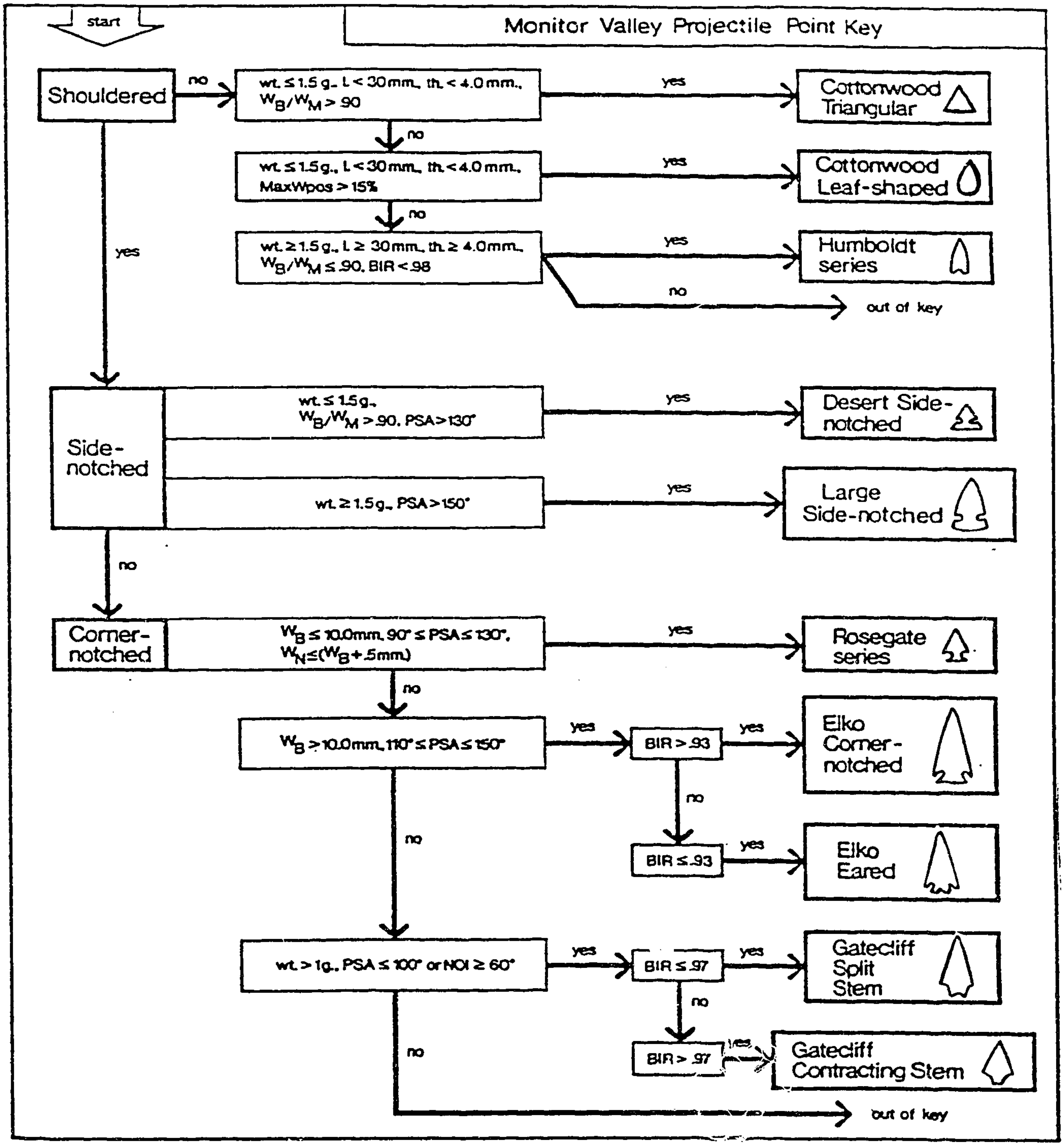


Fig. 2-2 The key to the projectile points from Monitor Valley, Nevada. (adapted from Thomas 1981: 25, fig., 11)

Table 2-1. **The Projectile Points of Wilson Butte Cave**

Point Types	W.B.C 1961	W.B.C.88-89	P/W collec	TOTAL	Frequency
Cottonwd Tr	0	1	8	11	3%
Cottonwd Lf	5	0	4	9	2%
Humboldt	7	2	5	14	4%
Desert S.N.	9	9	20	38	11%
Large S.N.	11	10	4	25	7%
Rosegate C.N.	35	27	63	125	35%
Elko C.N	3	14	34	51	14%
Elko Eared	0	3	4	7	2%
Gatecliff S.S.	6	2	9	17	5%
Gatecliff C.S.	4	0	1	5	1%
Rosegate S.N.	0	2	6	8	2%
CW Tr B.N.	0	0	1	1	less 1%
out of key	12	16	10	38	10%
Lanceolate	4				1%
Stemmed	5				1%
Totals	101	87	169		
			Overall total	357	

Key:
W.B.C = Wilson Butte Cave
Tr = triangular
Lf = leaf-shaped
S.N = side-notched
C.N. = corner-notched
B.N. = basally-notched
S.S. = straight stemmed
Cottonwd = Cottonwood

The Wilson Butte Cave Projectile Points

This is a classification of projectile points form the Perron/Webb collections. All catalogue numbers are mine, the "2 or 3" prefix is due to the fact that Perron marked all of his artifacts from Wilson Butte Cave with the number 2; therefore, the prefix "2" identifies Perron's projectile points. The number 3 was assigned by me to differentiate Webb's. The prefix "3" identifies Webb's projectile point. All dating of projectile points is from Thomas 1981.

Unshouldered Projectile Points
This class of unshouldered point (without side or corner notches) includes the Cottonwood Triangular, the Cottonwood Leaf-shaped, and the Humboldt series.

Cottonwood Triangular (post A.D. 1,300)

Number of specimens: 8
Form: Small: weight less than or equal to 1.5 g; length less than 30 mm.
Thin: Thickness less than 4.0 mm.
Triangular: Basal width/maximum width ratio greater than 0.90 (Thomas 1981:16).
Size range: weight 0.5 g - 1.3 g
length 14. 2 mm - 25.7 mm
thickness 2.3 mm - 3.8 mm
width 11.6 mm - 16.6 mm
Material: 1 lace (banded) agate, 7 obsidian, 1 ignimbrite
Catalogue numbers: 2-177, 3-121, 3-134, 3-135, 3-100, 3-92, 3-137, 2-158
Comparable types: Plew et al 1987:48-9 fig. 8; Heizer and Hester 1978:32, fig 4 g- k; Thomas 1981:16, fig 4 p-w; Gruhn 1961: plate 13 L
Comments: The base tends to be horizontal (flat), but may have a deeply concave to moderately convex morphology. The profile ranges from biconvex to plano-convex in cross-section. The Cottonwood Triangular point is also characterized by irregular flake scar patterns.

Cottonwood Leaf- shaped (post A.D. 1300)

Number of specimens: 4
Form: Small: weight less than or equal to 1.5 g
Length less than 30 mm
Thin: Thickness less than 4.0 mm
Basally rounded: Maximum width position greater than 15% (Thomas 1981:16)
Size range: weight 1.0 g - 1.4 g
length 21.6 mm - 27.4 mm
thickness 2.5 mm - 3.3 mm
width 12.4 mm - 14.9 mm
Material: 2 ignimbrite, 1 obsidian, 1 red chert
Catalog numbers: 2-139, 2-198, 2-224, 2-139
Comparable types: Thomas and Bettinger 1976: 284-5
Comments: The body of the point is convex converging with a round convex base but occasionally a straight flat base occurs (as in 2-224). The profile of the Cottonwood Leaf-shaped ranges from biconvex to plano-convex. Flake scar patterning is usually irregular.

Basally Notched Cottonwood Triangular
* THIS POINT TYPE IS NOT IN THE MONITOR VALLEY CLASSIFICATION. THIS POINT IS CONSIDERED TO BE A SEPARATE POINT TYPE DUE TO ITS UNDAMAGED AND REFINED ATTRIBUTES

Number of specimens: 1
Form: The base is concave in a 'V' format. The proximal half of the blade is vertically parallel, with the distal half being straight or converging. The profile is bi-convex with no side or corner notching.
Size range: weight 1.0 g
length 20.3 mm
thickness 2.8 m
width 14.4 mm
Material: Agate (banded)
Catalog number: 2-265
Comparable types: Gruhn & Bryan 1988:2, no. 2 (exhausted form of this point); Swanson 1972:105, fig., 50,c (Beaverhead C point).
Comments: This shape may reflect the final stages of attrition in larger unshouldered points. The converging distal half of the blade may have been retouched, with proximal half and base hafted and therefore unaltered. It is more likely that this point is at its final stage of use-life rather that the beginning, since it is the only one of its kind in the Wilson Butte Cave collections.

Humboldt series (ca. 3,000 B.C. - A.D. 700)

Number of specimens: 5
Form: Lanceolate: basal width/maximum width ratio less than or equal to concave-base: basal indentation ratio less than 0.98. Variable size: weight tends to be greater than or equal to 1.5 g, length tends to be greater than or equal to 4.0 mm . (Thomas 1981:17).
Size range: weight 2.3 g - 7.7 g
length 5.3 mm - 57.8 mm
thickness 3.6 mm - 5.8 mm
width 13.8 mm - 24.5 mm
Material: 4 obsidian, 1 ignimbrite
Catalog numbers: 3-95, 3-98, 2-243, 2-273, 3-111
Comparable types: Thomas 1981:17, fig. 5 a-k; Heizer and Hester 1978: fig. 1; Gruhn 1961: plate 36 a; Shutler & Shutler 1963: plate 5,4 a-b.
Comments: Base depth ranges from slightly concave to basal notching (2-273 has a deep basal notch). Size is variable, with flake scar patterns being quite uniform (pressure/ripple flaking).

SHOULDERED POINTS

Desert Side-notched (post A.D. 1300)

Number of specimens: 20
Form: Small - Weight less than or equal to 1.5 g
Triangular - Basal width/maximum width ratio greater than 0.90 (Thomas 1981:18)

Size range:

weight	0.5 g	-	1.5 g
length	16.1 mm	-	33.8 mm
thickness	2.2 mm	-	4.0 mm
width	7.1 mm	-	14.7 mm

Materials: 15 obsidian, 2 chert, 1 agate, 1 ignimbrite, 1 quartzite
Catalogue numbers: 2-141, 2-247, 2-237, 2-169, 2-151, 2-235, 2-232, 2-157, 2-182, 3-102, 3-108, 3-109, 2-234, 2-229, 2-138, 2-178, 2-257, 2-268, 3-106, 2-194.
Comparable types: Jennings 1986:118, fig.1; Thomas 1981:16, fig.4, a-o; Plew et al 1987:49, fig.7, f-h; Heizer and Hester 1978: fig. 5, d-i; Gruhn 1961:67 (type 10b), plate 14, o,p; Holmer and Weder 1980:58, fig. 9, j-l.
Comments: High side notches and pronounced basal notch or concavity are the diagnostics of this point. Specimens are bi-convex/lenticular in cross-section.

Large Side-notched (pre- A.D. 1300)

Number of specimens: 4
Form: Large - weight greater than 1.5g
Side-notched - proximal shoulder angle greater than 150 degrees (Thomas 1981:19)

Size range:

weight	1.1 g	-	4.4 g
length	24.8 mm	-	40.7 mm
thickness	2.5 mm	-	6.0 mm
width	12.5 mm	-	4.7 mm

Materials: 3 obsidian, 1 chert
Catalogue numbers: 2-73, 2-191, 2-239, 2-282
Comparable types: Jennings 1986: 117, fig. 3,13; Thomas 1981:19, fig. 6; Heizer and Hester 1978:fig.6, h-l, Plew et al 1987:50; Gruhn 1961:64 (type 9); Lynch et al 1965:47, fig., 1-d; Butler 1971:31, fig., 16, k-t; Shutler & Shutler 1963: plate 5, 1h.
Comments: Triangular blade element with straight to concave base. This form of projectile point could also be classified as a Uinta Side-notched point, which is characteristic of the Fremont (Holmer and Weder 1980). It is bi-convex in cross-section.

Rosegate series - Side Notched

* THIS IS NOT A MONITOR VALLEY POINT TYPE. IT IS A TYPE PREVIOUSLY CLASSIFIED IN SOUTHERN IDAHO (Plew 1987).

Number of specimens: 6

Form: Relatively small triangular blades with straight to slightly concave bases. All of Thomas' form rules for Rosegate apply (see below), but with side instead of corner notches. "Some points are small with blade configurations more like Eastgate points, having plano-convex cross-sections" (Plew 1987:44).

Size range:

weight	0.7 g	-	1.7 g
length	20.7 mm	-	35.7 mm
thickness	2.3 mm	-	5.3 mm
width	11.4 mm	-	13.8 mm

Material: 2 agate (banded), 4 obsidian

Catalogue numbers: 2-271, 2-269, 2-267, 2-183, 3-97, 3-123

Comparable types: Plew et al 1987:45, fig., 7,i-o; Butler 1971:31, fig., 16, b-c; Gruhn 1961: plate 37, f (point type 10a,11048); Swanson 1972:106. fig 51, b-k; Ranere1971: plate 13, j.

Comments: This type of projectile point does not appear in the Monitor Valley collection and is not part of Thomas' typology, but it appears sufficient numbers to warrant calling it a Rosegate Side-notched. These points have been found in reasonable numbers in southern Idaho, therefore; this discrepancy may be due to geographical distance.

Rosegate Series - Corner Notched (A.D. 700 - A.D. 1300)

Number of specimens: 63

Form: Small - basal width less than or equal to 10 mm

Corner-notched - proximal shoulder angle between 90 - 1300

Expanding stem - neck width less than or equal to (basal width plus 0.5 mm) (Thomas 1981: 19)

Size Range:

weight	0.2 g	-	2.3 g
length	12.0 mm	-	40.8 mm
thickness	2.1 mm	-	4.7 mm
width	6.8 mm	-	21.3 mm

Material: 43 obsidian, 9 chert, 5 ignimbrite, 5 agate, 1 quartz

Catalogue numbers: 2-286, 2-281, 2-280, 2-279, 2-278, 2-277, 2-276, 2-275, 2-274, 2-270, 2-264, 2-263, 2-262, 2-261, 2-260, 2-259, 2-258, 2-256, 2-255, 2-253, 2-250, 2-249, 2-245, 2-244, 2-242, 2-241, 2-240, 2-238, 2-233, 2-231, 2-230, 2-228, 2-227, 2-226, 2-225, 2-223, 2-222, 2-160, 2-159, 2-156, 2-155, 2-137, 2-192, 2-186, 2-185, 2-184, 2-176, 2-80, 2-79, 2-76, 2-72, 3-110, 3-112, 3-114, 3-122, 3-94, 3-99, 3-93, 3-107, 2-197, 2-144, 3-126, 3-104

Comparable types: Plew et al 1987: fig. 7, a-e; Gruhn 1961: plate 14; Heizer and Hester 1978: fig. 4, a, d-f; Jennings 1986: fig. 3,6; Thomas 1981: fig. 7; Lynch et al 1965: 47, fig., 4, e-n.

Comments: Bases are usually convex; blades may be parallel to converging. There is quite a variation in size. Profiles range from plano-convex to bi-convex.

Elko Series: Corner-notched (1300 B.C. - A.D. 700)

Number of specimens: 34

Form: Large: Basal width greater than 10 mm
Corner-notched: Proximal Shoulder Angle between 110 - 150
Basal Indentation Ratio less than or equal to 0.93 (Thomas 1981: 20,21).

Size range:

weight	0.8 g	-	6.1 g
length	17.2 mm	-	47.1 mm
thickness	2.4 mm	-	6.6 mm
width	11.6 mm	-	24.6 mm

Material: 2 ignimbrite, 26 obsidian, 4 chert, 2 agate

Catalogue numbers: 3-96, 3-132, 3-130, 3-113, 2-71, 2-70, 2-78, 2-81, 2-170, 2-55, 2-56, 2-57, 2-171, 2-172, 2-173, 2-199, 2-143, 2-147, 2-152, 2-154, 2-236, 2-246, 2-248, 2-252, 2-254, 2-266, 2-272, 2-283, 2-284, 2-285, 2-287, 3-91, 3-127, 2-189.

Comparable types: Thomas 1981: fig., 8, a-i; Jennings 1986:117, 10; Heizer and Hester 1978:fig., 3, f,g,i; Gruhn 1961: plate 14, q, r; Shutler & Shutler [illegible]. plate 5, 1f, 1g.

Comments: Elko Corner-notched are usually bi-convex in profile. The lack of a basal notch differentiates this type from the Elko Eared type in the series.

Elko Eared (1300 B.C. - A.D. 700)

Number of specimens: 4

Form: Point is corner-notched with concave base (basal width > 10.0 mm), 110° < PSA< 150°
Basal Indentation Ratio: less than or equal to 0.93 (Thomas 1981:21)

Size range:

weight	1.9 g	-	7.2 g
length	30.2 mm	-	47.0 mm
thickness	4.6 mm	-	7.3 mm
width	21.1 mm	-	27.4 mm

Material: 4 obsidian

Catalogue numbers: 3-90, 2-82, 2-54, 2-174

Comparable types: Thomas 1981: fig., 8, o-bb; Jennings 1986:118, 10c; Heizer and Hester 1978: fig., 3, a-e, h, i, k; Heizer and Krieger 1956:149, plate 14.
Comments: The blade is usually a convex converging shape.

<u>Gatecliff Split - stem (3,000 B.C. - 1300 B.C.)</u>

Number of specimens: 9
Form: Size: Weight greater than 1 g.
Contracting stem: Proximal Shoulder Angle less than or equal to 100 degrees or Notch Opening Index greater than 60 degrees.
Basal Indentation Ratio: Less than or equal to 0.97

Size range:			
weight	1.0 g	-	3.0 g
length	22.3 mm	-	37.8 mm
thickness	3.4 mm	-	5.8 mm
width	13.4 mm	-	22.3 mm

Material: 1 agate (banded), 7 obsidian, 1 vitreous Quartzite
Catalogue numbers: 2-175, 3-128, 3-125, 3-101, 3-103, 3-105, 2-149, 2-150, 2-251
Comparable types: Thomas 1981: fig., 9; Heizer and Hester 1978: fig.,2 a, c, d; Gruhn 1961: plate 14, A, B (type 8a).
Comments: Broad triangular blade, straight or convex converging. It has shallow corner notching with slight shoulders and a wide indented base. Lenticular in cross-section.

<u>Gatecliff Contracting - stem (3,000 B.C. -.)</u>

Number of specimens: 1
Form: Size: Weight greater than 1 g
Contracting stem: Proximal Shoulder Angle less than or equal to 100 degrees or Notch Opening Index greater than 60 degrees
Basal Indentation Ratio: greater than 0.97

Size:	
weight	1.0 g
length	19.0 mm
thickness	4.0 mm
width	16.1 mm

Material: obsidian
Catalogue number: 2-196
Comparable types: Thomas 1981: fig 10; Jennings 1986: 118, 8a (Gypsum point); Heizer and Hester 1978: fig., 4, b, c (Rose Spring Contracting stem).
Comments: The base of this point is broken and therefore may not represent a Gatecliff Contracting stem but a damaged form of the Gatecliff Split stem or a point in the Elko series. These points lack basal indentations.

OUT OF KEY : THESE POINTS DID NOT FIT INTO THE MONITOR VALLEY PROJECTILE POINT KEY

Small shouldered points

Number of specimens: 10
Form: These points do not fit into any of the previous categories
Size range:

weight	1.1 g	-	2.4 g
length	26.1 mm	-	31.8 mm
thickness	2.5 mm	-	5.8 mm
width	10.5 mm	-	18.3 mm

Materials: 4 Obsidian, 4 chert, 1 Quartz, 1 Silicious basalt
Catalogue numbers: 2-1, 2-75, 2-146, 2-3, 3-116, 2-153, 2-148, 3-136, 2-74, 2-2.
Comparable types: No comparable types found
Comments: All but one of these points are not notched (with rounded or straight bases). Two are stemmed and one is corner-notched.

CONCLUSION

The points of importance to this thesis are those within the time range of a possible Fremont migration or diffusion from northern Utah into southern Idaho. This event could have taken place from A.D. 700 to A.D. 1400. The points that fall within this Fremont time range are:

COTTONWOOD SERIES:
1. Cottonwood Triangular Post A.D. 1300
2. Cottonwood Leaf-shaped Post A.D. 1300
3. Cottonwood Basally notched

DESERT SIDE-NOTCHED
1. Desert Side-notched Post A.D. 1300

ROSEGATE SERIES:
1. Rosegate Side - notched
2. Rosegate Corner - notched A.D. 700 - A.D. 1300

These point types have been used to define the presence of both the Fremont and the Shoshone. The Rosegate series are prevalent point types within Fremont sites in Utah; and the Desert Side-notched point, due to its later occurrence, is usually found within Shoshone sites. The Cottonwood series has often been used as a catch-all category including blanks, preforms, and knives as well as projectile points. It is my belief that what Thomas classifies as the Cottonwood projectile point series is actually a group of unfinished point forms of either the Desert Side-notched or the Rosegate series.

D. BLANKS AND PREFORMS

Archaeologists have spent a great deal of effort constructing typologies to classify projectile points. Often, if a point does not fit into a particular typology system it is labeled as anomalous and ignored, or classified as a new type of point. Sixteen point forms from the Perron/Webb collection did not fit into Thomas' Monitor Valley typology system. I believe it is unlikely that all of these points represent separate types, or were traded in from a different region. They are most likely unfinished or exhausted point forms of existing point types. The term exhausted refers to those points that have been damaged and repaired to an extent that they could not, if broken again, be repaired. Even though these points have been modified during their use-life, evidence of what they would have looked like should still be recognizable from their bases, as discussed in the previous section.

However, it is not always easy to detect evidence of what an unfinished point was supposed to be. Don Crabtrees' pioneering work flint knapping in the 1960s and 1970s, initiated a great deal of further research into the techniques and processes involved in making stone tools (Muto 1971a, 1971b; Butler 1980; Pavesic 1966, 1985; Flenniken 1985). Experimental archaeology doing flint knapping has provided a better understanding of the processes and problems inherent in tool production; and has demonstrated the potential range of morphological variation which may occur in the production of one point type from the initial blank stage, through the preform stage, to the finished product and beyond.

The same point type can look very different from one stage of production to another. A point type may not be recognized from its blank or preform state due to the lack of notches, A maker's intent is impossible to predict, althought certain techniques and degree of blank or preform shaping might provide clues indicating what kind of point types they could have become. Don Crabtree (in Muto 1971a) defined a blank as:

> "a usable piece of lithic material of adequate size and form for making a lithic artifact such as an unmodified flake of a size larger than the proposed artifact, bearing little or no waste material, suitable for assorted lithic artifact styles, not yet to the preform stage"(Ibid.:p.36).

A preform is considered to be a more finished blank (Ibid:109). Pavesic (1985:68) refined Crabtree's definition of preforms by adding that a preform lacks the refinements of the complete tool, such as notching and edge retouch. A characteristic of blanks found at the Sterling Cache site in southern Idaho (Muto 1971b) is that they generally have edge grinding platform preparation.

> " An explanation for the occurrence of this characteristic is that many knappers prepared a specimen for pressure flaking by grinding the edge. The ground edge thus acted as a platform for striking off the pressure flakes" (Muto 1971b:54).

The preforms from the Birch Creek site in southern Idaho, described by Swanson (1972:107), also have evidence of edge grinding. What Swanson calls the Beaverhead preforms have been ground completely around the edge so that the tool can be finished by pressure flaking. The difference between blanks and preforms is that flaking is progressively more refined, better controlled, and more consistently spaced as production moves up the production series from the blank, to the preform, to final product (Muto 1971a: 112).

Blanks and preforms recovered in southern Idaho tend also to be triangular in outline, with a flat or excurvate base (Pavesic 1985:68). They are ubiquitous throughout southern Idaho, and thought to be in the production sequence for Desert or large side-notched points (Butler 1968; 1981).

Using criteria based on base morphology, thickness, and edge refinement, I have reclassified 23 unnotched point forms from the original groupas point blanks or preforms that had previously been classified as Cottonwood series points or as knives (due to the fact that they exhibited signs of wear). I have created the category called "Type A" to classify small unnotched bifaces with refined pressure-flaked outlines as preforms. I have also designated these preforms as the proto-types for Desert Side-notched points, since both type A preform and Desert Side-notched points have a small pressure-flaked triangular form. The only physical difference between the two is that one is notched and one is not.

More irregular percussion-flaked bifaces with oval or egg-shaped outlines, I have termed "Type B" blanks. These blank forms may have had two functions, either as the stage before the preform or as a preform themselves. There are points in the P/W collections that are rougher in outline and characterized by predominantly more percussion than pressure flaking . These kinds of points, that are usually irregular in their finished state, generally fall into the category of Rosegate series projectile points. As previously discussed, the Rosegate points are recognized as representatives of a Fremont presence; and the Desert Side-notched as Shoshone. The presence of these preforms implies that both cultures were actually making their projectile points in Wilson Butte Cave, or transporting them in the blank or preform state.

<u>TYPE A</u> : PREFORMS (triangular shaped)

Preform: Pre= prefix denoting priority, first. Form, from the Latin "forma"= to shape. Preforming denotes the first shaping; i.e., blank. Preform is an unfinished, unused form of the proposed artifact. It is larger than, and without the refinement of the completed tool. It is thick, with deep bulbar scars; has irregular edges; and no means of hafting. Generally made by direct percussion; not to be confused with a blank! (Muto 1971, Appendix III, Glossary).

Number of specimens: 12

Form: Isosceles format, straight to convex converging sides. They have straight, horizontal bases with the base being the widest part of the artifact. The profile is generally biconvex, with occasional examples of planoconvex or twisted profiles.

Size range:				
	weight	0.5 g	-	1.9 g
	length	14.2 mm	-	27.4 mm
	thickness	2.3 mm	-	4.5 mm
	width	11.7 mm	-	18.3 mm

Material: 1 ignimbrite, 8 obsidian, 2 chert, and 1 quartz

Catalogue numbers: 3-137(C. trian), 2-158(C. trian), 3-139(C. trian), 2-224 (C. leaf), 3-100(C. trian), 2-195(knife), 3-92(C. trian), 3-135(C. trian), 2-1 (out of key), 2-148 (out of key), 2-3 (out of key), 3-136 (Humboldt).

Comparable types: Butler 1980:127, fig 10r; Swanson 1972:105 fig 1; Muto 1971a:112; Swanson et al 1964, fig 2 a-h; Pavesic 1985:68; Ranere 1971:plate 13 l,m (Beaverhead); Gruhn 1961:plate 37, b-c (point type 6a), plate 36, c (point type 5a), d (point type 5b)

Comments: The stages of manufacture seems to go from crude to refined, using both pressure and percussion flaking. There is no evidence of edge grinding, though there is some evidence of wear. The only preform that shows evidence of edge damage is 2-195, which was originally classified as a knife (from the assumption that knives show evidence of wear). Preform projectile points should have no evidence of use wear since they would not yet have been at a finished state. These preforms needed only to be notched to be finished, and from the position of these notches, becoming side-notched points, perhaps in the form of Uinta rather than Desert side-notched or large side-notched points (Muto 1971a: fig. 20). These artifacts are defined by Muto as "preforms" rather than blanks (1971a: fig. 30). The range of irregularity and shape within this class denotes the range of lithic stages in the class of "preform".

TYPE B: BLANKS (leaf-shaped, basally rounded)

Blank is defined as: "A usable piece of lithic material of adequate size and form for making a lithic artifact - such as unmodified flakes of a size larger than the proposed artifact, bearing little or no waste material, and suitable for assorted lithic artifact styles" (Muto 1971a: 36).
Number of specimens: 11
Form: Straight to convex converging sides with a gently rounded base. The widest point of the artifact may be anywhere near the base to half-way up the blade (generally at 1/4). The profile tends to be plano-convex in morphology, ranging to biconvex.

Size range:	weight	0.7 g	-	2.5 g
	length	19.5 mm	-	31.3 mm
	thickness	2.3 mm	-	5.3 mm
	width	11.1 mm	-	16.7 mm

Material: 1 ignimbrite, 9 obsidian, 1 chert.
Catalogue numbers: 2-177 (C. trian), 2-146 (out of key), 2-139 (C. leaf), 2-198 (C. leaf), 3-121 (C. trian), 2-27 (knife), 3-134 (C.trian), 2-153 (out of key), 2-188 (knife), 3-116 (out of key), 3-133 (knife).
Comparable types: Butler 1980:14, fig 4 a-c (short nar row leaf); Gruhn 1961:59; Swanson and Sneed 1971:65, fig., 15 a-b; Muto 1971a; fig 24, a-c.
Comments: These artifacts have been defined by Muto as the earlier stages of manufacture, being blanks rather than preforms (1971, fig., 30).

None of the preforms or blanks in the P/W collections show evidence of edge grinding; however, one of the triangular preforms does show evidence of wear (micro-flake edge damage), and most of the basally rounded blanks show signs of wear. This wear may be confused with intentional edge preparation. Plew and Woods (1985: 223) have done a microscopic examination of artifacts and replicated specimens that suggest that fresh pressure-flaked margins possess technological effects that appear similar to the edge damage that results from certain functional applications . It might be difficult to detect, based on micro-flake damage of the edge, whether a tool has been used or newly made.

The initial stage in the production continuum of a point is thick and irregular in outline, whereas preforms, near the final stage, are thinner with a more symmetrical outline and a more regular pattern of pressure flaking.

Therefore, preforms are more apt to be classified as a finished point type; for example, Thomas has classified the Cottonwood Triangular as a point rather than an unfinished preform.

The division between rounded and flat-based point forms may represent a division between blank forms and preforms. As previously discussed, type A preforms are more finished in form with a more defined outline; these point forms tend to be pressure, rather than percussion-flaked. The type B blank form, on the other hand, has a wider range of formal and size variation. These point forms are mostly percussion-flaked, with an unfinished, irregular outline. The degree of refinement between type A and B may represent two basic states in the preparation of points. However, I believe that the difference between the two point forms is a result of each type being the preform for two different projectile point types. Type A shares the same formal and technical attributes of the Desert Side-notched point, both pressure-flaked with the base as the widest point of the point. Type B shares the same attributes as the Rosegate series point type. They both tend to be irregular in outline and convex at the base. The size ranges of both point forms fit into their proposed point type size range.

The question seldom addressed by archaeologists when dealing with point blanks and preforms is why they occur at all in the archaeological record. Why would a tool maker undertake to make a projectile point and stop at a certain stage? Perhaps a point travelled better unnotched than notched, as it would have been less likely to break. The choice of shaft and hafting style was perhaps directly influenced by the type or environment of animal being hunted; and therefore, the point may only have been notched and fitted during the hunt (or slightly before). Carrying unnotched points may have afforded the hunter the versatility to choose between different hafting techniques and hunting different kinds of prey in different environments.

If this hypothetical scenario were true, then the basic shape of the preform would not change; only the position of the notches would be altered, and therefore point types would be more of a functional rather than a stylistic classification. Or perhaps, as described by Binford (1986) regarding the lithic production process for knives by Australian Aborigines, the projectile points were made in separate stages by different people and cached to be finished at a later time.

Since the blanks and preforms in the P/W collections are out of context with no provenience, their association with certain point types is purely conjectural; however, they will be included in the discussion as Rosegate series (leaf-shaped blanks) and Desert side-notched (triangular preforms) point forms. Evidence of these point preforms in Wilson Butte Cave may indicate the actual production of Rosegate points, rather than being the result of trade, or exchanged ideas. This interpretation would demonstrate the actual physical presence of the Fremont people themselves.

E. CONCLUSION

The Perron/Webb collections were created by excavating approximately one meter below the surface of deposits in Wilson Butte Cave. A maximum depth of 1 m reaches the level of Stratum B (Gruhn 1961), and marks the time period between A.D. 1300 and the present. This is the cultural phase known as the Dietrich phase; and covers the time period in which the Fremont occupation of southern Idaho would have occurred. One could therefore hypothesize that if two cultures both occupied Wilson Butte Cave, one would expect to find the diagnostic projectile points of both cultures as we see in the Perron/Webb collections.

Overall, the projectile points from the P/W collections tell us that the people who camped in Wilson Butte Cave in the latest occupations had knowledge of bow and arrow technology. It is likely that these people used the cave as an early spring hunting camp for bison as they moved from their winter occupation along the Snake River to their spring/summer occupations on the Camas prairies (Butler 1968). We know generally then what they were doing, but who were they?

Gunnerson (1960:374) and Holmer and Weder (1980:35) agree that there is no single distinctive tool type or projectile variety, or any combination of tool types or projectile points which occur in all or even most Fremont sites. Therefore there is no cross-cutting toolkit that can be used for comparative purposes to identify a Fremont presence. There are, however, Fremont projectile point types common to specific geographical regions. The Great Salt Lake variant from the northern area of Utah is of most interest, since this is the region in which the Fremont migration or diffusion is supposed to have originated.

> "The Great Salt Lake variant of Fremont extended at least as far north as the southern end of the Northern Rocky Mountains and as far west as the Weiser River drainage basin and the Oregon-Idaho border in western Idaho, and persisted in the Snake River region of southern Idaho at least to the end of the 16th century, long after its demise in northern Utah presently estimated at A.D. 1300-1350." (Butler 1982:13,14).

As previously stated, there is no single type of point generally accepted as representative of the whole Fremont culture area; however, archaeologists do recognize a significant concentration of Bear River, Uinta side-notched, and Eastgate Expanding stem points in the northern Fremont region (Holmer and Weder 1980:57, fig. 8). The Rose Spring point also occurs in the northern region, and is described as representing an earlier Fremont point type (circa. A.D. 300). According to Holmer and Weder (1980), these point types decreased in frequency over time in the Great Basin; and were gradually replaced by regionally diagnostic types by A.D. 850-900. The Desert Side-notched point is not considered to be of Fremont origin, rather Shoshone points dated to around A.D. 1150 (Holmer and Weder 1980:60).

Bear River and Uinta side-notched points have been found in association with Great Salt Lake Gray and Uinta ceramics (Fremont), with a temporal range of A.D. 750-1350 for Bear River and A.D. 800 to 1200 for the Uinta point. There is no question in my mind as to their Fremont origin. In total, then, the projectile points representing a possible northern expansion of Fremont from the Great Salt Lake region are Bear River, Uinta side-notched, and the Rosegate series.

Shoshone points are a little harder to define since most work on Shoshone technology has been ethnographic, and the late appearance of bow and arrow technology in the 16th or 17th century ad. produced small, amorphous, side- and corner-notched points (Murphy & Murphy 1986:295; Holmer & Weder 1980: 55). However, like the Fremont, there are Shoshone points specific to geographical regions. In the eastern area of southern Idaho the Shoshone presence is characterized by projectile points closely comparable to the Avonlea or Avonlea-like points found in Montana and Wyoming (Butler 1981:252). Frison (1978) describes the Shoshone occupation as being characterized by small side-notched and corner-notched points. Rosegate type projectile points were not found at the Dean Site on Browns Bench (southern Idaho) (Bowers and Savage 1962:13), or at the Weitas Creek Site (north-central Idaho); these sites had mainly side-notched points (23/30), and the rest Plano or Elko points (Keeler 1973:27); nor were any Rosegate points found at Nahas Cave (southern Idaho) - only Desert Side-notched, Cottonwood Triangular, Cottonwood Bipoint, and Bliss points were found here (Plew 1986:98).

The Bear River and Uinta Side-notched points may be re-termed large side-notched points according to Thomas' typology. Therefore, Rosegate and large side-notched points represent 44% of the projectile point total in the Perron/Webb collection; and would represent 47% if the leaf-shaped blanks, (not included in the original typology), are also included. Desert Side-notched points represent only 12% of the original point types, but 14% if the triangular preforms are counted. Not all the points in the Perron/Webb collection represent the time period between A.D. 700 and the present. Points such as the Elko, Gatecliff, and Humboldt series were produced by earlier people in the Great Basin, and compose 31% of the Perron/Webb collection. Therefore counting only the projectile points of Dietrich phase, the Fremont type points represent 77% (169) of the assemblage and the Shoshone only 23% (50). With such a high frequency of Fremont type points in a traditionally Shoshone region, Idaho archaeologists should carefully reexamine their reconstruciton of the culture history of southern Idaho, and include the Fremont as participants.

CHAPTER 3: <u>OTHER LITHIC ARTIFACTS</u>

This chapter deals with all other lithic artifacts that are not projectile points. This category includes: knives, retouched flakes, scrapers, awls, drills, ground stone tools, and miscellaneous lithic tools.

I . KNIVES:

This section deals with cutting tools, or knives. These tools are generally bifacially flaked, with micro-flake scar patterns that indicate a cutting/slicing function (fig. 3-1 a). Flakes are usually used as knives (including blades), but core tools can also be used in a cutting function.

These artifacts are defined as cutting tools as opposed to scraping tools by the presence of bifacial flaking, and the lack of steep edge retouch; and by the slanted or multi-directional orientation of the micro-flake scar pattern visible on the use edge of the knife. Lawrence's use-wear analysis (1977) has illustrated that a cutting action creates a flake scar pattern that is slanted (unidirectional or multidirectional) to the cutting edge, whereas micro-flake scar edge damage created by a scraping action is generally oriented perpendicular to the edge (fig. 3-1 b). Small pointed bifaces that could morphologically fit into the projectile point preform classification have been classified as knives due to the presence of micro-flake scar damage characteristic of a cutting action.

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Fig. 3-1 a Fig. 3-1 b

Microflake scar patterns produced by cutting (a) and scraping (b) functions (Lawrence 1977: fig. 9 & 10).

A. BIFACES:

The bifaces in the Perron/Webb collections were classified into three categories on the basis of their flake technology and refinement of outline and edge. I used the "stage form" approach which was developed by Muto (1971a; 1976), and modified by Elston et al. (1977), and used by Zerga and Elston (1990) in the James Creek Shelter report and by Jennings (1980) in the Cowboy Cave report. The reduction sequence of a biface is divided into distinct stages:

-Selection of a blank of correct size and shape;
-Creation of regular cross and longitudinal sections and outline;
-Creation of haft element and edge treatment (Elston et al 1977).

Elston et al. (1977) have attempted to operationalize this trajectory of tool production by describing the characteristics and qualifications for three basic stages of bifacial production.

Stage I Biface

Exhibit only minimal modification. Original flake surfaces (and often cortex) may still be evident. Modification usually is oriented toward regularizing cross section and outline in order to allow controlled thinning in subsequent stages. Flake scars often do not cross the mid-line of the piece.

Stage II Biface

Is characterized by controlled thinning; flake scars usually cross the mid-line and evidence of original flake morphology has been obliterated. The biface begins to resemble final form.

Stage III Biface

Exhibit controlled thinning and shaping. Haft elements (if any) have been added, and final edge treatment (reduction of arises of large thinning flake scars) has been applied (Zerga and Elston 1990:191).

The Perron/Webb collections contains examples of all three stages of biface production. There are four classifications of finished biface types in the collection, represented by 15 bifaces and 22 preforms. There are six blanks that are too amorphous to be identified as a specific type of biface. The classification and description of biface types is based on the biface typologies used by Gruhn in her first Wilson Butte Cave report, as well as another typology from the same area (Gruhn 1961; Plew et al 1987). These types were slightly modified to suit best the morphological bifaces presented in the Perron/Webb collections.

Blanks are characterized by the predominance of percussion flaking, and more than 5% residual cortex. Preforms in the P/W collections have less than 5% residual cortex, and intrusive rather than marginal flake scars; but show some remnant of the original flake surface (ventral face). The finished bifaces have regular pressure-flaked outlines with a definite small or large pointed, bi-pointed, ovoid or scalpel shape.

CLASSIFICATION

Stage I Bifaces: BLANKS
Number of specimens: 6
Form: Bifaces exhibiting predominantly percussion flake technology. More than 5% cortex. Irregular outline and profile.

Size range:	weight	0.9 g	-	24.9 g
	length	18.7 mm	-	53.0 mm
	thickness	3.7 mm	-	13.2 mm
	width	16.5 mm	-	33.8 mm

Material: 3 obsidian, 1 ignimbrite, 1 quartz, 1 chert.
Catalogue numbers: 2-4, 3-86, 2-9, 3-67, 3-73, 3-124.

Stages II and III Bifaces: Preforms and Finished Knives.

TYPE 1A: SMALL POINTED BIFACE FORMS
Form: Length less than 40 mm.
Pointed proximal end, blade convex or concave converging; base is convex

Type 1a, Stage II: Small Pointed Biface Preform
Number of specimens: 6
Form: Retouch is from 1/2 to 1/3 intrusive (towards the mid-line). The form is thinner and more regular in shape than blanks.

Size range:	weight	1.4 g	-	5.5 g
	length	22.1 mm	-	40.0 mm
	thickness	3.3 mm	-	8.8 mm
	width	15.5 mm	-	24.3 mm

Material: 3 obsidian, 1 unknown (heat-treated)
Catalogue numbers: 3-131, 2-193, 3-129, 2-31

Type 1a, Stage III: Small Pointed Bifaces
Number of specimens: 7
Form: Pressure flaked, regular edge and outline.

Size range:	weight	0.9 g	-	3.0 g
	length	21.0 mm	-	31.5 mm
	thickness	3.2 mm	-	7.2 mm
	width	11.5 mm	-	17.6 mm

Material: 7 obsidian
Catalogue numbers: 2-30, 3-140, 2-200, 3-133, 2-188, 2-27 and 2-195
Comparable types: Muto 1971a:114, fig 5; 1971b:116, fig 6; Marwitt 1970:59, fig 28, c-d.

TYPE 1b: LARGE POINTED BIFACE FORMS

Form: Length more than 40 mm. Pointed proximal end, convex or concave, converging blade, convex to straight base.

Type 1b, Stage II: Large Pointed Biface Preforms

Number of specimens: 10

Form: Percussion flaked, residual cortex (under 5%). Outline thick and uneven with minimal retouch.

Size range:

weight	20.9 g	-	28.9 g
length	62.5 mm	-	68.9 mm
thickness	6.0 mm	-	11.4 mm
width	32.7 mm	-	41.5 mm

Material: 2 obsidian, 1 ignimbrite, 1 chert (exotic banded green colour)

Catalogue numbers: 3-24, 2-50, 3-60, 3-117

Comments: 2-50 has remnant percussion flake scars surface area and cortex, which would classify it as a blank; but its pressure flaked outline makes it a biface preform.

Type 1b, Stage III: Large Pointed Biface

Number of specimens: 3

Form: Pressure flake scars obliterating original percussion flake scars, thinner outline with edge refinement.

Size range:

weight	3.7 g	-	19.3 g
length	40.6 mm	-	61.7 mm
thickness	5.5 mm	-	9.7 mm
width	18.1 mm	-	31.0 mm

Material: 1 obsidian, 2 chert

Catalogue numbers: 3-144, 2-47, 3-52, 2-44.

Comparable types: Muto 1971b:114, fig. 5, 113, fig. 1a; Lindsay & Lund 1976:46, fig 18 a, b; Marwitt 1970:59, fig 28 a-e; Aikens 1967b:87, fig 38 r; Dalley 1976:34, fig 17, c, e.

Comments: In 2-47, notching has been attempted. This biface fits with Muto's classification from the Braden site (1971b: 116, fig 28 a-e).

TYPE 2: BI-POINTED BIFACE FORMS

Form: Convex or irregular, converging to a point at both proximal and distal ends. The points may be positioned at either side of the mid-line, in an almost crescent or scalpel shape.

Type 2, Stage II: Bi-pointed Biface Preforms

Number of specimens: 3

Form: Evidence of original flake scar or percussion flake scar surface still visible. Less than 5% residual cortex.

Size range:

weight	15.7 g	-	21.7 g
length	54.3 mm	-	75.2 mm
thickness	8.9 mm	-	11.4 mm

width 4.9 mm - 26.8 mm

Material: 1 obsidian, 1 agate (lace), 1 chert,

Catalogue numbers: 2-83, 2-48, 2-51

Comparable types: Muto 1971 b: fig 4, d.

Comments: The amount of cortex on 2-48 is more than 5% and puts it in the class of blank; however, pressure flaking and the refinement of the outline qualifies it more as a preform than a blank. 2-51 may be a graver as well as a knife.

__Type 2, Stage III:__ Bi-pointed Bifaces

There are no artifacts exhibiting the qualities of a finished bi-pointed biface.

__TYPE 3: OVOID BIFACE FORMS__

Form: Ovoid shape with rounded convex distal and proximal ends. Less than 5% residual cortex.

__Type 3, Stage II__: Ovoid Biface Preform

Number of specimens: 6

Form: Percussion flake scars more than 1/3 intrusive towards the mid-line.

Size range:

weight	5.1 g	-	16.4 g
length	32.8 mm	-	99.2 mm
thickness	6.1 mm	-	11.7 mm
width	19.6 mm	-	40.0 mm

Material: 3 obsidian, 2 ignimbrite, 1 quartz, 1 chert

Catalogue numbers: 2-15, 3-75, 3-118, 3-143, 3-39, 2-43.

Comparable types: Lindsay and Lund 1976:48, fig. 19, b; Marwitt 1970:61, fig. 30, a, b.

__Type 3, Stage III__: Ovoid Bifaces

Number of Specimens: 1

Form: More regular in outline than the preform, pressure flaked.

Size:

weight	8.1 g
length	52.8 mm
thickness	6.7 mm
width	23.5 mm

Material: obsidian

Catalogue number: 3-21

Comments: 3-21 has been broken at the proximal end. It may have been the base of a stemmed point.

TYPE 4: SCALPEL BIFACE FORMS

Form: Distal end pointed and positioned at either side of the mid-line. One edge is relatively straight while the other curves around to meet it at a point. The shape of the biface resembles that of a surgical scalpel. The base is straight to convex.

Type 4, Stage II: Scalpel Biface Preform

Number of specimens: 3

Form: Residual original flake scar surface; flake scars more than 1/3 intrusive towards the mid-line.

Size range:	weight	3.3 g	-	11.9 g
	length	37.9 mm	-	51.7 mm
	thickness	5.4 mm	-	8.6 mm
	width	22.4 mm	-	29.7 mm

Material: 1 obsidian, 1 ignimbrite, 1 chert.

Catalogue numbers: 3-71, 3-84, 3-145

Type 4, Stage III: Scalpel Bifaces

Number of specimens: 2

Form: Pressure flaked, regular outline and profile

Size range:	weight	1.8 g	-	4.2 g
	length	32.2 mm	-	38.7 mm
	thickness	3.6 mm	-	6.1 mm
	width	13.2 mm	-	18.3 mm

Material: 1 obsidian, 1 quartz

Catalogue Numbers: 2-58, 3-147

Comparable types: Marwitt 1970:61, fig. 30, a-d; Aikens 1967b:49, fig. 38, w & y.

Comments: It is unknown whether or not 3-147 was broken intentionally to achieve this shape, or if it was broken accidentally. These bifaces may have been hafted.

SIZE OF BIFACE FORMS

A. BLANKS
STAGE I

NUMBERS	6
Thickness	(mm)
Mean	8.75
St. Dev	3.1
.Width	
Mean	27.6
St. Dev	5.4
Length	
Mean	41.1
St. Dev	11.1

Table 3-1. Mean and standard deviation of the dimensions of blanks

B. PREFORMS AND BIFACES

Stage/type	II1a	III1a	II1b	III1b	II2	III2	II3	III3	II4	III4
NUMBER	6	2	4	3	3	0	6	1	3	2
Thickness	mm									
Mean	5.5	5.5	8.7	7.7	11.2	N	9.1	6.7	7.1	3.2
St. Dev	2.1	1.6	1.9	1.7	1.8		2.1	-	1.3	1.2
Width						O				
Mean	19.2	17.2	36.8	26.2	25.8		27.1	23.5	26.9	15.7
St. Dev	3.0	0.4	3.1	5.8	0.8	N	8.4	-	3.8	2.5
Length										
Mean	31.8	22.6	67.7	48.0	67.7	E	51.7	52.8	44.7	35.5
St. Dev	6.9	1.8	4.9	9.7	9.5		22.3	-	5.6	3.2

Table 3-2. The mean and standard deviation of the dimensions of the four biface types. All preforms must have larger dimensions than their finished biface form.

DISCUSSION

Since blanks are in the initial stages or production, individual blanks are too amorphous to be identified as a certain type of biface. The dimensions of the blanks in fig. 3-2 cannot be expected to be larger than the preforms or finished bifaces in fig. 3-3, since fig. 3-2 is a composite of all possible blank types, whereas fig. 3-3 bifaces have been divided into their recognizable types. The dimensions representing blanks should be generally larger than preforms and blanks; but these results may be misleading since the blank dimensions in Fig. 3-2 have been averaged out. According to Muto's (1971a) stage theory, the preforms should be larger than bifaces, since they are a step behind in the lithic reduction process. In all biface forms except type 3 this is the case, confirming that the Perron/Webb collections contains the full range of the biface production continuum.

The anomalous dimensions for the thickness, width, and length of ovoid bifaces (type 3) may be explained by research done by Weder (1980) looking at the Cowboy Cave site bifaces. He found that ovoid bifaces are generally the starting point from which more specialized shapes are made. This fact may explain why ovoids do not quite fit the hypothesis that the dimensions of preforms must be larger than their finished type of biface. Weder is implying that ovoid bifaces, by definition, are blanks; and indeed 100% of the blanks in the P/W collections are ovoid in shape.

The amount of wear visible on the bifaces also indicates their state of completion. One out of six blanks or 17% had evidence of use-wear, 15 out of 22 preforms or 68% had wear, and seven out of eight bifaces or 88% had signs of use-wear. The question is raised however; that if the blank has evidence of use-wear, how can it still be a blank? It seems that use-wear damage is most visible on biface forms which are farthest along the production sequence. As Weder (1980:39) suggests, the "large jump in wear polish prevalence from preforms to knives indicates that the wear polish on blanks and preforms was probably the result of opportunistic use."

Unfortunately, the stylistic variation of bifaces over time and space seems to be negligible, or at least not apparent to archaeologists. Therefore biface types, unlike projectile point types, have not been used as diagnostic artifacts for the Fremont or the Shoshone. What the distribution of bifaces has demonstrated, however is that the biface types in the Perron/Webb collection could have been produced by either group of people at any time, since they appear in both Shoshone and Fremont sites. Therefore bifaces cannot be used to test the hypothesis that the Fremont once occupied Wilson Butte Cave.

B. RETOUCHED FLAKES:

There are 20 artifacts in this category; twelve are retouched flakes which are classified as such by the visible presence of a platform and bulb of percussion with marginal unifacial flaking. They are generally unifacially retouched. These flakes have been defined as knives rather than unifacial flake scrapers, due to their lack of steep marginal retouch and a micro-flake scar pattern characteristic of a cutting, rather than scraping action. Two retouched debitage fragments, either core fragments or flake fragments, which are missing their bulb or platform or percussion but have clearly been made from a flake, are also included in the classification of retouched flakes.

There are six blades in the P/W collections classified under the category of retouched flakes. All blades are unifacially flaked, with a cutting micro-flake scar pattern.

1. RETOUCHED FLAKES

Number of specimens: 12

Size range:	weight	4.2 g	-	26.5 g
	length	22.7 mm	-	61.2 mm
	thickness	6.2 mm	-	35.9 mm
	width	18.0 mm	-	40.4 mm

Material: 8 obsidian, 1 jasper, 1 ignimbrite, 2 quartz
Catalogue numbers: 3-35, 2-10, 3-70, 3-34, 2-46, 3-66, 2-45, 3-31, 2-28, 3-23, 3-74, 3-119

Comments: 3-66 has been previously flaked, then weathered and retouched at a much later date. 3-74 has been burinated along its distal end (possibly broken during manufacture, then burinated).

2. RETOUCHED DEBITAGE

Number of specimens: 2

Size range:

weight	12.3 g	-	34.2 g
length	38.2 mm	-	77.6 mm
thickness	5.2 mm	-	10.4 mm
width	33.8 mm	-	54.4 mm

Material: 1 siltstone, 1 jasper, 1 obsidian
Catalogue numbers: 3-54, 3-78
Comments: 3-54 may be a unifacially flaked slab of naturally occurring siltstone or shale.

3. RETOUCHED BLADES

Number of specimens: 6

Size range:

weight	4.5 g	-	7.8 g
length	41.2 mm	-	56.1 mm
thickness	4.9 mm	-	8.1 mm
width	12.4 mm	-	24.7 mm

Material: 4 obsidian, 2 chert
Catalogue numbers: 2-53, 2-52, 3-25, 3-77, 3-48, 3-38
Comments: 3-48 and 3-77 have been burinated in order to back the blades to make use easier.

C. SCRAPERS

This section deals with scraping tools. There are 64 scraping tools in the Perron/Webb collections. Scrapers are defined as such by having a steeply retouched edge and micro-flake scar pattern oriented perpendicular to this edge, suggesting a scraping action. The scrapers have been organized into 12 categories according to how their scraping edge is oriented in relation to their platform and bulb of percussion. If they lack a platform and bulb of percussion, they are classified according to the location of the working edge in relation to their longest axis. For purposes of continuity, Gruhn's 1961 classification of scrapers from Wilson Butte Cave has been used.

Classification

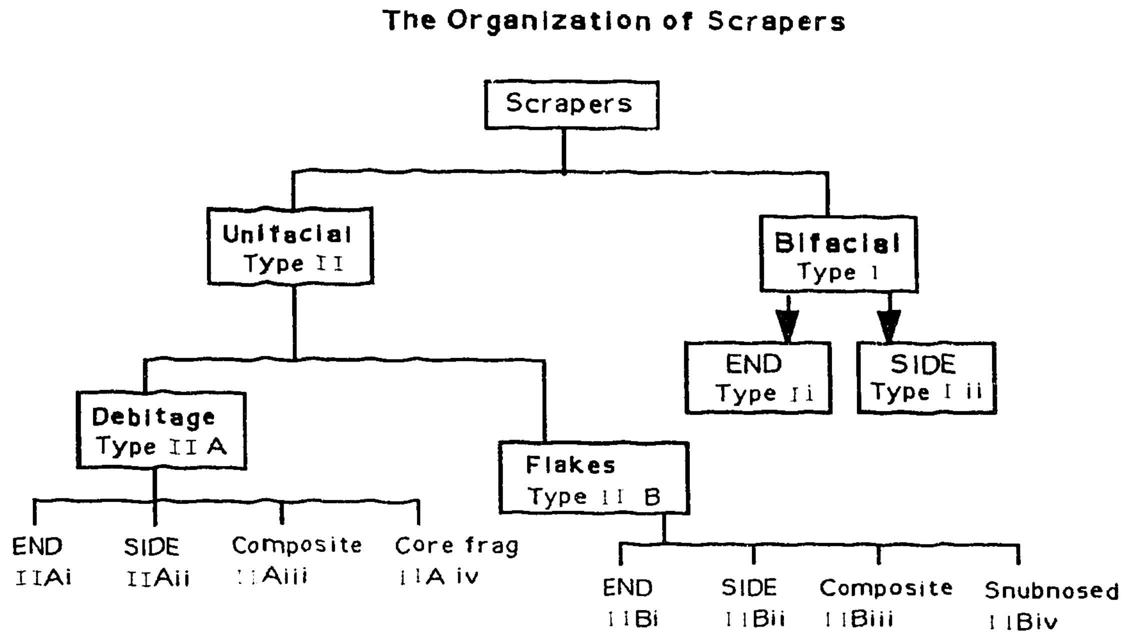

Fig., 3-2
The scrapers are divided into those that have been bifacially flaked, those that have not; and those that have been made on flakes and those that have not. The morphology of the tool has been used to define snubnosed and convergent scrapers.

Type I : Bifacially flaked scrapers.

This category correlates with Gruhn's type 4 in her 1961 classification of scrapers from Wilson Butte Cave (p. 80). She described this form as "Biface; rectangular outline with straight sides and both ends rounded. Triangular or plano-convex cross-section" (p. 80). I would classify a scraper as being bifacial if it has bifacial flaking on the ventral surface more than 1/3 intrusive towards the center-line. The platform and bulb of percussion is not generally visible on bifacially flaked scrapers. The scraper is then classified according to the location of the scraping edge in relation to its longest axis. There are two kinds of bifacial scrapers in the P/W collections: end and side scrapers.

Type I i: Bifacial End Scrapers

Number : 5

Form: Generally triangular in shape. Convex rounded bit with straight to convex converging sides. The scraping edge is oriented along one (or both) of the shortest axis of the tool (the widest rather than the longest side).

Size range:				
	weight	0.9 g	-	11.4 g
	length	11.8 mm	-	44.2 mm
	thickness	2.3 mm	-	10.4 mm
	width	14.4 mm	-	30.2 mm

Raw Material: 1 obsidian, 1 quartz, 3 chert.

Catalogue Numbers: 2-18, 3-45, 3-22, 3-138, 2-5.

Comments: Scrapers 2-18, 3-45 and 3-22 have the same triangular morphology that suggests that they may have been hafted. 3-45 has been burinated on one side (the other has a hinge fracture), perhaps in order to facilitate hafting.

Comparable types: Gruhn 1961, plate 16, G-H.

Type Iii: Bifacial Side Scraper

Number: 8

Form: Generally rectangular to triangular in outline. One end of the longest axis can be pointed (5 specimens) or rounded at both ends. The bit of the scraper is positioned along the long axis of the tool, and is slightly convex.

Size Range:				
	weight	1.1 g	-	7.9 g
	length	23.0 mm	-	37.8 mm
	thickness	4.2 mm	-	8.8 mm
	width	14.7 mm	-	23.1 mm

Raw material: 4 obsidian, 1 lace agate, 3 chert (2 of them jasper).

Catalogue numbers: 2-187, 3-146, 3-50, 2-69, 3-72, 2-90, 3-83, 3-141.

Comments: Most of these scrapers are generally rectangular in shape, and are not likely to have been hafted.

Comparable types: Gruhn 1961, plate 16 G-H.

Type II: Unifacial Scrapers

These scrapers have been flaked on only one side. This category has been divided into end, side, composite, and snubnosed scrapers according to the position of the scraper edge in relation to the flake platform or the longest axis, and the morphology of the scraper edge itself. The classification of snubnosed scraper was continued from Gruhn's 1961 classification due to its importance. In Gruhn's collection these scrapers accounted for 35% of the total number of scrapers, and were found predominantly in stratum A (1961:82). This was the only kind of scraper that Gruhn found in the stratum that represents the Dietrich phase.

__**Type IIA.** Debitage Scrapers__

These scrapers have been made from either broken flakes, or core fragments. Their platform and bulb of percussion are missing or have been removed, providing no way to classify the scraper according to the position of the scraper edge in relation to the platform. These scrapers are classified in the same manner as the bifacial scrapers. If the scraper use edge is oriented along the longest axis, then it is a side scraper; and an end scraper has its scraper use edge along the shortest axis. Core fragment and convergent scrapers are included in this category, and defined by their morphology.

__**Type IIAi:** Debitage End Scraper:__

Number: 7

Form: There is no correlating classification from Gruhn's 1961 scraper typology. This form is defined as having the scraper edge along the shortest axis (the widest rather than the longest edges). The scraper edge is strongly convex (with one example being only slightly convex). Four out of seven type IIAi scrapers are broken at the proximal end. They are irregular in shape.

Size range:	weight	2.2 g	-	10.6 g
	length	18.1 mm	-	40.5 mm
	thickness	5.0 mm	-	9.3 mm
	width	19.7 mm	-	30.7 mm

Raw material: 1 obsidian, 1 agate (banded), 5 chert (2 of them Jasper).

Catalogue numbers: 3-42, 3-80, 3-47, 3-59, 3-69, 3-40, 3-76.

__**Type IIAii:** Debitage Side Scraper:__

Number: 4

Form: There is no correlating classification for this type in Gruhn's 1961 typology. This form is defined by having its scraper edge located along the longest axis of the tool (the longest rather than the shortest sides). The shape is generally an elongated rectangle. The scraper use edges are straight to slightly convex.

Size range:	weight	3.0 g	-	11.7 g
	length	23.5 mm	-	43.9 mm
	thickness	6.4 mm	-	7.8 mm
	width	14.5 mm	-	56.8 mm

Raw material: 1 chert, 1 obsidian, 1 siltstone, 1 vitreous quartzite.

Catalogue numbers: 3-81, 3-32, 3-41, 3-49.

Comments: 3-32 has been notched above and below the scraper bit. This notching may have been done to facilitate hafting, but may also have been for hooking and cutting fibrous material.

__**Type IIAiii:** Debitage Composite Scraper:__

Number: 6

Form: There is no correlating classification for this type in Gruhn's 1961 classification. This form is defined by having one or more scraper edges along both the long and short axes of the tool (it could have scraper use edges along the entire parameter). The shape is generally rectangular to irregular, and the scraper edges are convex through straight to concave in form.

Size range:	weight	6.1 g	-	62.2 g
	length	21.3 mm	-	82.0 mm
	thickness	8.1 mm	-	12.9 mm
	width	21.6 mm	-	49.9 mm

Raw material: 4 obsidian, 1 chert, 1 heat-treated quartz.

Catalogue number: 3-79, 3-28, 2-25, 2-24, 3-68, 2-6.

Comments: all but one of these scrapers has some form of notch or concave surface area. This seems to be a prevalent feature of side and composite scrapers, perhaps implying a different function from end scrapers.

Type IIAiv: Debitage Core Fragment Scraper:

Number: 1

Form: This form can be compared to Gruhn's type 5 scrapers, made on core-trimming flakes. She defines this type as: "scrapers made on thick core-trimming flakes with cortex adhering. Oval or rectangular outline, irregular cross-section" (p. 80). This scraper has been made from a thick core fragment (the platform and bulb of percussion are missing). There is, however, no cortex on this scraper; it may have been a unifacial flake core, that, once exhausted, was used as a scraper. There is steep retouch around 3/4 of its parameter.

Size:	weight	43 g
	length	51.0 mm
	thickness	20.2 mm
	width	42.2 mm

Raw material: chert

Catalogue number: 2-14

Comparative type: Dalley 1976:41, fig. 20 c, d. (heavy core tool).

Type IIAv: Debitage Convergent Scraper

Number: 1

Form: There is no comparable classification in Gruhn's 1961 typology. This form is defined as being a side scraper with scraper edges on both long axes that converge to a point. The sides are slightly concave and steeply retouched. The distal end of the tool, the base, shows no sign of retouch or use as a scraper.

Size:	weight	3.7 g
	length	34.4 mm
	thickness	6.2 mm
	width	21.2 mm

Raw material: chert

Comments: This tool could also have been used as a graver (the point is slightly hooked). The raw material has also been heat-treated, as shown by the removal of pot-lids.

Type IIB: FLAKE SCRAPERS

These scrapers are made from flakes on which the platform and bulb or percussion are intact. The position of the platform in relation to the scraper edge determines whether the scraper is an end, side, or composite scraper. The morphology of the tool defines a snubnosed scraper.

Type IIBi: Flake End Scraper:

Number: 7

Form: This classification might correspond to Gruhn's type 2 : Large crude end scrapers, which she defines as " end scrapers; unifaces; square or oval outline; convex bit, irregular cross-section" (p. 79). The only difference between Gruhn's classification and this one is that in order to classify a scraper as an end scraper, the scraper edge must be parallel to the flake platform. The use edge of the scraper must be predominantly positioned at the distal end of the flake.

Size range:	weight	1.7 g	-	13.2 g
	length	21.3 mm	-	43.3 mm
	thickness	5.0 mm	-	12.3 mm
	width	16.4 mm	-	33.7 mm

Raw material: 1 obsidian, 1 petrified wood, 2 vitreous quartzite, 3 chert.

Catalogue numbers: 3-56, 2-12, 3-58, 3-120, 3-62, 3-51, 3-44.

Comments: 3-62 has been notched at one side, and may have been used to hook and cut hide, sinew, or fibrous material.

Comparative types: Lindsay and Lund 1976: 49, fig. 20 e.; Dalley 1976, fig. 19 i, r.; Sharrock 1964: 89, fig. 51 j, k.

Type IIBii: Flake Side Scraper:

Number: 8

Form: This form might correspond to Gruhn's type 7: Large flake side scraper. She defines this type as a "side scraper made on large irregular flakes or segments of flakes with one or two edges retouched. Irregular in cross-section" (p. 81). This classification differs from Gruhn's in that these scrapers are made from flakes with the bulb and platform of percussion intact, in order to determine that the scraper edge is located perpendicular (at either side) to the platform. These scrapers are roughly oval to irregular in outline, with convex to concave scraper edges.

Size range:	weight	2.1 g	-	26.2 g
	length	26.4 mm	-	63.2 mm
	thickness	5.3 mm	-	12.8 mm
	width	15.4 mm	-	47.6 mm

Raw material: 6 obsidian, 2 chert

Catalogue numbers: 3-115, 3-33, 3-27, 2-29, 3-85, 3-63, 3-142, 2-8.

Comment: 3-85 has a concave scraping edge that suggests it may have been used as a wood shaft smoother, or for taking off bark. 3-142 seems to have been notched, perhaps for hooking and cutting animal or vegetable fibers.

Comparative types: Aikens 1967b:49, fig. 39 i, j, k; Hogan 1980:100, fig. 45 j; Swanson 1972: 100, fig 45, aa-cc.

Type IIBiii: Flake Composite Scrapers

Number: 13

Form: There is no comparable classification in Gruhn's 1961 scraper typology. These scrapers have one or more scraper edges along sides both parallel and perpendicular to the platform of percussion. They have been used as both end and side scrapers. This form is generally square to rectangular in shape. The scraper edge is generally straight to convex. This type of scraper is also generally larger than either the side or end flake scrapers.

Size range:	weight	1.4 g	-	25.2 g
	length	21.9 mm	-	65.2 mm
	thickness	5.3 mm	-	13.5 mm
	width	14.8 mm	-	37.8 mm

Raw material: 2 ignimbrite, 1 quartz, 1 vitreous quartzite, 6 chert (2 of them jasper), 3 obsidian.

Catalogue number: 2-26, 3-29, 2-17, 2-7, 3-46, 2-13, 3-53, 2-19, 2-21, 2-16, 3-37, 2-77, 3-26.

Comments: On 3-29, the edge parallel to the scraper edge has been burinated, perhaps in order to "back" the scraper; the burin edge may also have been used as a graver. All but three of these scrapers have a notched or concave edge.

Comparative types: Lindsay & Lund 1976: 49, fig. 20 c; Schroedl & Hogan 1975: 48, fig. 10 p.

Type IIBiv: Flake Snubnosed Scraper

Number: 5

Form: This form is comparable to Gruhn's type 1: Snubnosed scrapers. She defined this form as being "small, thick, uniface, generally ovoid or pear-shaped outline. Markedly convex, steeply retouched bit, straight sides converging to pointed or rounded butt. Cross-section plano-convex or keeled" (p. 78). These scrapers have that diagnostic thick, steeply retouched bit with a triangular wedge-like shape.

Size range:	weight	4.3 g	-	8.5 g
	length	23.5 mm	-	35.8 mm
	thickness	8.5 mm	-	11.2 mm
	width	18.6 mm	-	28.0 mm

Raw material: 3 chert, 1 quartz (rose), 1 agate (banded).

Catalogue numbers: 2-20, 3-82, 2-11, 3-57, 3-55.

Comments: 2-20 has been broken and refitted. 3-82 has been notched near the scraper edge. Striations running from the notch on the ventral surface are perpendicular to the edge, suggesting perhaps that the notch had a definite function; and was used for hooking and cutting animal or vegetable fibers.

Comparable types: Gruhn 1961 plate 16 a-c.

DISCUSSION

Scrapers are tools which occur in most prehistoric sites. Many of these scrapers do not change in form or size within or between groups over time, so that scrapers are rarely used as a diagnostic material culture item. Technically the term scraper is applied to tools that have been used in a scraping or planing fashion, but traditionally this classification of tool is believed to have been used only in the preparation of hides. Schroedl and Hogan (1975) believe that scrapers can be divided into three subdivisions, each having a different function; and not all necessarily involved with the processing of hides.

> Flake side-scrapers
> Unaltered flakes selected for a nearly flat surface with an adjacent steep edge. The severity of use marks suggests that primarily flakes such as these were wood-working tools selected when needed and readily discarded.
>
> Unifacial scrapers
> Unifacial retouch along one or both of the lateral edges. There was no attempt at overall shaping; extensive retouch was done to round the opposite edge, facilitating a firmer grip.
>
> "Domed" or "Turtleback" scrapers
> Manufactured from thick flakes, and characterized by thick triangular cross-sections. Sections formed by the removal of two flakes producing a longitudinal ridge prior to removal of the tool from the core. Further finishing of the tool by pressure flaking steepened the edge and rounded the outline (1975: 49).

Six out of eight Perron/Webb flake side scrapers have cortex adhering, suggesting that they were perhaps expedient tools. These scrapers do not show abnormally high heavy use wear along their scraper bits; but they are generally much larger than flake end scrapers, they have irregular outlines, and all but three of them have been notched or have a pronounced concave scraper edge. The presence of an irregular edge, notches, or a concave scraper edge would not seem to be useful in the processing of hides, since one avoids ripping the hide. It would make more sense to agree with Schroedl and Hogan's theory that these are expedient wood-working tools. The debitage side scrapers and a great many of the composite scrapers would fall into this category of wood-working tools. The regular convex edges of end scrapers seem to be more suited to the scraping of soft hides.

Adovasio ([illegible]) proposes that the "domed" or "turtleback" (snubnosed) scrapers are part of the definite tool kit of the Fremont. There are five (8% of the scrapers) of these "domed" scrapers in the Perron/Webb collections, and 14 (35 % of the scrapers) in the 1961 Gruhn collection which are classified as snubnosed scrapers (18% of a total of 104 scrapers). The longitudinal flake scars are not so obvious on the P/W scrapers; but they are thick and triangular in shape and have a steeply rounded scraper edge. The fact that these snubnosed scrapers were confined to Stratum A (the Dietrich phase) (Gruhn 1961: 82) of Wilson Butte Cave supports the theory that these types of scrapers may have had a Fremont origin.

D. AWLS AND DRILLS

This category includes a total of six chipped stone artifacts that have been used to puncture, engrave, or drill in some fashion or another. All of the tools have been retouched or pressure-flaked to produce an elongated point. Three of these tools (3-43, 2-140 and 2-145) have been produced from flakes and blades, and retouched to form a sharp point. There is no indication that these drills may have been hafted; they were probably hand-held engravers as well as awls. The size range for these pointed flakes is weight 0.8 g - 2.8 g; length: 25.5 mm - 49.6 mm; thickness: 2.8 mm - 5.2 mm; and width: 11.2 mm - 22.3 mm.

The remaining three artifacts have been more carefully shaped, with narrow elongated blades with a rounded end, and a wide base by which they could have been hafted. Number 2-180 has a concave base with small shoulders not exceeding far beyond the width of the blade. Artifact 2-179 has a larger convex base and 2-181 has shoulders protruding at the mid-point of the blade with an elongated concave base below the shoulders the same width as the blade above it. The size range for these pressure-flaked awls is weight 0.9 g - 3.0 g; length 25.3 mm - 39.6 mm; thickness 3.0 mm - 6.7 mm; and width 12.9 mm - 18.1 mm.

Plew et al (1987) documents awls much like 2-180 and 2-179 at the Baker Caves sites in southern Idaho (p. 60, fig. 14, d, e), which he attributes to the Shoshone; but he also "does not exclude Fremont contact" (p.43) at this site, making them of undetermined origin. These types of awls have also been found in Fremont areas by Aikens (1967b:23, fig. 24) at Snake Rock Village; Sharrock (1964:89, fig. 51, c-g) in the Glen Canyon area; Berry (1975:91, fig. 11, b) in northeast Arches National Park; Madsen and Lindsay (1977:43, fig. 24, j) at Backhoe Village; and finally Marwitt (1970:95, fig. 55, d-f) at Median Village. It is evident that these awls are abundant in Fremont sites.

E. GROUND STONE TOOLS

a. Abraders/ Shaft Smoothers

There are four abraders in the Perron/Webb collections. These artifacts are rectangular in shape, with rounded edges and ends. They are all made from sandstone. Each abrader has at least one groove worn into its surface, with a maximum of six grooves. The width of the grooves varies from 8 to 9 mm (which is the same width as an average projectile point shaft). The grooves are oriented in proximal/distal direction, along the longest axis of the rectangular artifact. Not all grooves run the whole length; but may stop at the mid-point or 3/4 point along the length. The size range is weight 26.8 g - 71.5 g; length 51.1 mm - 82.2 mm; thickness 16.7 mm - 20.4 mm; and width 28.2 mm - 38 mm.

These types of shaft smoothers/abraders are found in both Shoshone (Plew et al 1987:64-65, fig. 15 and 16 at the Baker Caves sites) and Fremont (Marwitt 1970:93, fig. 34, d-c at Median Village) sites. I assume that these artifacts are not diagnostic of one group or another, but common to all groups who share a bow and arrow technology.

b. Hammerstones

There are two hammerstones in the Perron/Webb collection (3-87 and 2-166). Number 2-166 is cigar-shaped in outline and triangular in cross-section. Both ends have been heavily battered. The use wear pattern at either end suggests the user held the tool in his hand and brought the tip down at an angle to the material he was striking. It is most probable this was a flint knapping tool, possibly for more controlled percussion rather than pressure flaking. Number 3-87 is a much thicker oblong shape. Both ends of the tool have been heavily battered. The use wear pattern suggests the tool was being brought directly down on to the subject material, and the suggests that it was used as a pestle to pound food or fibrous materials rather than as a lithic hammerstone. The individual sizes of these tools are included in Appendix A.

c. Miscellaneous Ground Stone

There are four miscellaneous artifacts that do not fit into the previous category of ground stone artifacts. Number 3-30 is a small basalt pebble that has been grooved on three sides. Its size range is weight 2.7 g; length 35.4 m; thickness 7.6 mm; and width 2.7 mm. Tuohy 1991 (personal communication) suggests that this artifact may have been used as an abrader perhaps to sharpen fine bone awls, as the interior is rough.

Number 3-36 is close to the shape of 3-30, and is also a grooved water-worn basalt pebble. Its size range is weight 1.8 g; length 25.3 mm; thickness 4.3 mm; width 10.3 mm. Tuohy (1991, personal communication) suggests that this artifact is not a tool but rather a gaming piece, due to its lack of striations. It could have been used as a stone marker with bone dice.

Number 2-220 has also been produced from a basalt pebble. It is smooth and oblong in shape, wider in the middle than at its rounded ends. Size range is weight 10.1 g; length 41.0 mm; thickness 13.9 mm; and width 13.1 mm. The stone is perfectly smooth, if it was originally polished to achieve that "bead" shape, the striations have been worn away over time due to handling. Tuohy (1991, personal communication) suggests that this is a "plum-stone" die.

The last miscellaneous artifact, 2-163, is a piece of cut, curved volcanic tuff. Both the ventral and dorsal surfaces have been abraded smooth (they are covered with striations), and the distal end has been sawn and snapped. The purpose of this fragmentary artifact is unknown, but it is suggested that it could have been part of the production sequence of a pipe. Its size is weight 2.3 g, length 20.5 mm, thickness 4.1 mm, and width 21.5 mm.

F. MISCELLANEOUS LITHIC ARTIFACTS

There are 75 unmodified water-worn pebbles in the Perron/Webb collections. The fact that these manuport pebbles are all approximately the same size, with a range of different colours and raw materials, suggests that these pebbles were involved in some sort of game; perhaps with the same kind of function as bone gaming pieces. The raw materials are quartz, chert, basalt, and vitreous quartzite. The collective weight of the pebbles is 78 g, with an average weight of 1.0 g. The average dimensions are length 10 mm x thickness 8 mm x width 8.6 mm. The pebbles seem to have been selected for their round shape. Such pebbles were also found by Gruhn in 1988/89. Artifacts like these pebbles may have been found in other sites in southern Idaho; but due to their unmodified nature, their significance has gone undetected.

CONCLUSION

Although lithic bifaces, scrapers, awls, and modified flakes are not traditionally used to identify the material culture of specific groups, they do sometimes have a range of morphological variation that is characteristic of certain groups.

All biface types in the Perron/Webb collections have been found in both Fremont and Shoshone sites. Obviously specialized shapes like scalpel or bi-pointed bifaces have a specific function or functions. Unfortunately most of the work in associating certain kinds of tools with specific groups of people is done on projectile points rather than domestic tools. Very little can be said about the cultural affiliation of bifaces found at Wilson Butte Cave, until more cross-cultural research is done. What can be said, however, is that the bifaces do fit within the technological range of ability of both the Fremont and the Shoshone; and that these tools cannot be used to discount the presence of the Fremont in Idaho.

Scrapers, like bifaces, are difficult to classify according to who made them, although it has been noted by adovasio (1970:86), that turtleback scrapers are common to certain Fremont sites in Utah. A total of 18% of the combined 1961 Gruhn and P/W collections scrapers fit into this turtleback category. The substantial presence of these kinds of scrapers may be an inconspicuous indication of a Fremont presence. Unfortunately, as with biface typology, not enough research has been focused on domestic tools like scrapers. Perhaps if more widespread inter-regional comparative studies were done using domestic tools in addition to the more exciting projectile points, regional or cultural similarities might be demonstrable.

All of the lithic artifacts like awls and drills, retouched flakes, blades, abraders, hammerstones, and grooved stone artifacts have been found in significant numbers in Fremont sites. The little water-worn pebbles found in concentrations by Perron and Webb, and by Gruhn in 1988/1989 may have had a Fremont affiliation. As previously stated, amongst the trait list of the Fremont, round pebbles are found in great numbers in Fremont sites (Wormington 1955:176). Their function was probably similar to the gaming piece (they will be described in the following chapter), as counters or markers. The pebbles from Wilson Butte Cave were probably brought there by hand. The sheer number of them illustrates th presence cannot be coincidental. The cultural significance of these pebbles can never be demonstrated, but it does seem likely that they were of Fremont rather than Shoshone origin, since the Shoshone have never been known to play a game, or to have any use for little round pebbles.

It can, therefore, be concluded that round river pebbles and turtleback scrapers are lithic items that have previously been associated only with the Fremont. The knives, other scrapers, awls, etc. are domestic artifacts within the tool kits of almost every prehistoric peoples. The refinement or crudity of a tool generally has more to do with the raw material it is made from than the level of technological knowledge the maker possesses. A people with well-developed lithic skills can still utilize a rough simplistic tool, perhaps intentionally for a certain task. Although it has been said about the Shoshone that "neither the chipped stone implements nor other aspects of material culture were noted for their excellence"(Spencer and Jennings 1965:279), they probably had a more sophisticated technology than most realized. It is possible, then, that most of the items described in this chapter on lithic artifacts other than projectile point, could have been produced by either the Shoshone or the Fremont. One could not preclude a Fremont occupation on the basis of any of these lithic artifacts.

CHAPTER 4 BONE ARTIFACTS

Introduction

The P/W collections include a total of [illegible] ished bone artifacts: 73 gaming pieces, 20 awls, seven bone tubes or beads, part of a bow, and three miscellaneous artifacts. There are no unmodified faunal specimens, due to the collectors' bias of retaining only recognizable bone artifacts from Wilson Butte Cave. The raw materials for bone artifacts consisted of splinters of ribs and limb bones. Identification of the bone raw material to the species level was not possible because the artifacts could not be removed from the collectors' homes. The only faunal identification possible was at the basic level, distinguishing between mammal and bird bone, and their relative sizes. The collective information on the individual size and classification of each bone artifact is available in Table 5-1.

A. Gaming Pieces

Gaming pieces have been described as those artifacts which appear to have no other function than as some sort of gaming piece or die in a gambling game (Madsen & Lindsay 1977; Marwitt 1970:101). The majority of gaming pieces are made by sawing, splitting, polishing, and decorating square or rectangular sections of mammal long bone. Gaming pieces can be decorated using a number of methods: by smearing them with ochre, or by smoking or burning them white or black, or by incising or drilling patterns on their dorsal surface.

The P/W collections include 73 gaming pieces, which constitutes 67% of the bone artifact assemblage. This high concentration in itself is unusual for a Shoshone site, since gaming pieces occur infrequently if at all, outside the traditional range of Fremont influence. Gaming pieces are ubiquitous in Fremont sites in Utah. These Fremont gaming pieces are generally square to rectangular in shape (Wormington 1955:155), with a wide range of decoration techniques. The design most recognizable as being Fremont is the rectangular piece with a hole in the center (Madsen & Lindsay 1977:71). There is, however, a wide range of gaming pieces with different designs recognized as Fremont, most of which are found in the P/W bone gaming piece assemblage.

I have reconstructed the production sequence for gaming pieces in order to classify each piece according to the stage of production that it is in. I have also identified two formal classes of gaming pieces: type A and type B.

The Production Sequence of Gaming Pieces

The presence of gaming pieces in various stages of completeness has facilitated the reconstruction of the production sequence of gaming pieces from Wilson Butte Cave:

1. A long bone or rib of medium size is selected and cleaned. The exterior or cortex is cleaned or smoothed with a scraping tool. The bone is normally mammal, determined by the presence of trabecular (cancellous) material on the ventral surface (the interior of bird bone is smooth) (fig. 4-1 A).

2. The piece of bone is then split longitudinally to create a long rectangular, slightly curved segment. This splitting may have been done by wedging and splitting the piece; or by breaking it by hand, as there are no saw marks visible. The splitting is done before the length of bone is divided into sections, because the saw marks made for the segmentation are visible on both the ventral (trabecular) and dorsal (cortex) faces of the pieces (fig. 4-1 B).

3. The rectangular length of bone is broken into the desired gaming piece size by sawing across the width of the bone to create smaller square shapes; then when the bone is sufficiently weakened, snapped. The sawing action is usually done from more than one angle, causing a "V" shaped indentation, usually into the dorsal face, not penetrating farther than 1 - 2 mm. Force is then applied to snap the length into sections at the

saw marks. At this point the segment of bone can be used as a gaming piece, and be either actively or passively polished (fig. 4-1 D).

4. At this stage most gaming pieces are actively polished. The ragged trabecular material along the edge of the snaps are removed by a grinding or polishing action, probably achieved with some kind of grinding stone, in all directions of movement. The trabecular material on the ventral surface is unmodified. Only the sides and ends, and perhaps the dorsal surface are smoothed (fig. 4-1 E).

5. The gaming piece is now decorated by a variety of means. It can be rubbed with yellow or red ochre, stained with some other pigment, burnt white or smoked black. The piece can also be serrated, incised, or drilled with holes for decoration (fig. 4-1 F).

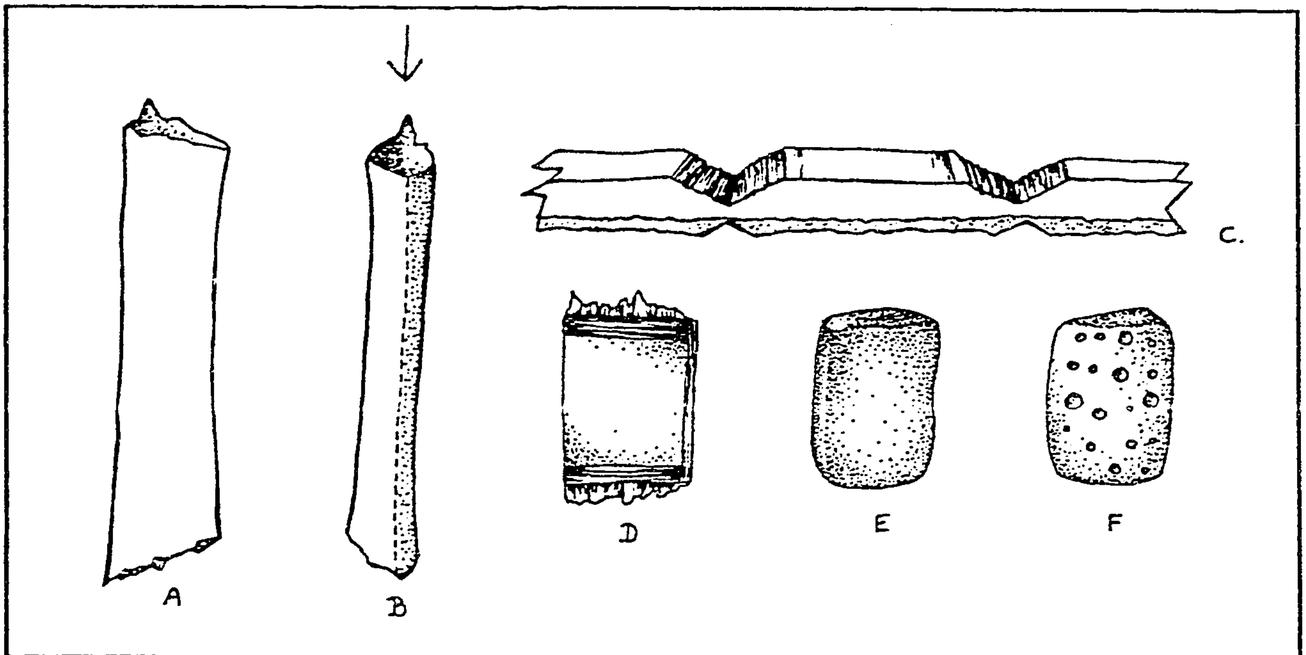

Fig. 4-1. The production sequence of bone gaming pieces

Only nine of the 73 gaming pieces in the P/W collections are broken. The 1961 Gruhn assemblage has 13, all from stratum A. The range of formal variation seems to fall into two distinct categories: those that are generally square to rectangular, and those that are elongated rectangles. The smaller square gaming pieces I have named type A (being the most common type of the P/W collections at 91%), and the elongated gaming pieces I have called type B. Type A is defined as have only slightly longer length dimensions than width, whereas type B specimens are more than twice as long compared to width. The function of these two classes of gaming pieces appears to be the same, and the division is mainly for classificatory purposes. There are insufficient data to indicate a functional rather than a stylistic difference between my type A and type B. The tables with the information on each individual artifact are in the appendix.

Marwitt (1970:101) differentiates between a gaming piece and a gaming stick in the literature, by describing the gaming sticks as long lengths of decorated wood, (fig. 4-2). These sticks are the kinds of dice sets used by the Shoshone in southern Idaho (Lowie 1909:197). None of these kinds of gaming pieces were found at Wilson Butte Cave.

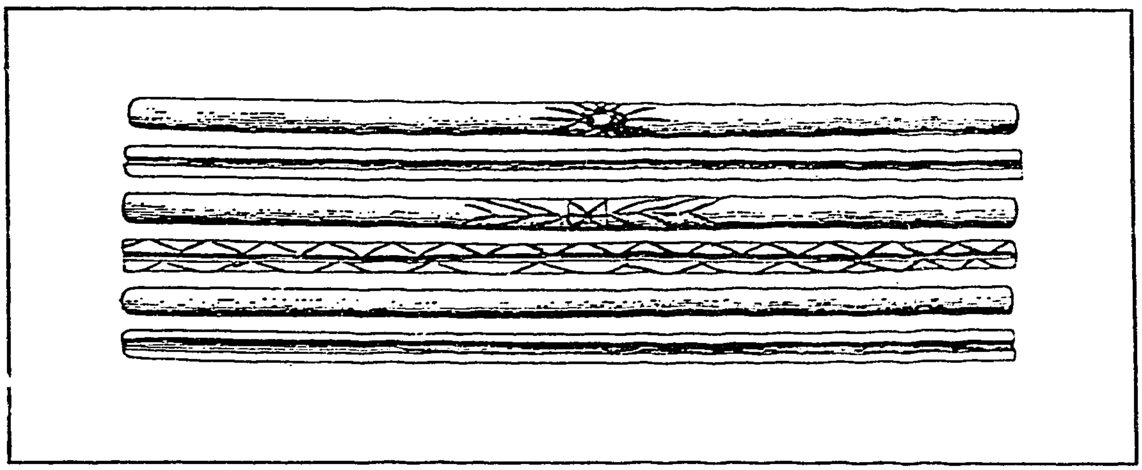

Fig. 4-2. Shoshone gaming pieces (adapted from Lowie 1909:197)

<u>TYPE A: Square to Rectangular Gaming Pieces</u>

Due to the number of gaming pieces in this category, it is possible to recognize artifacts in most of the stages of gaming piece production. All production stages except for the first two are represented; perhaps the initial stages of gaming piece were not collected because they were not immediately recognized as artifacts by Perron and Webb.

__Stage 3:__ (fig. 4-1 D)

Stage 3 is the production stage in which the longitudinally split section of long bone is divided into the desired size of an average gaming piece, approximately 25 mm in length and slightly smaller in width, to produce a square to rectangular shape. The gaming pieces are separated by grooving the sections, then snapping them; there is no sign of polishing. There are seven artifacts of type A in this third stage of production. Four (3-6, 3-16, 3-9, 2-42 [burnt on its dorsal left side]) of the seven artifacts have saw marks on only one end, suggesting that these sections may have been the ends of the bone sawn off to get rid of the jagged edge. These pieces would not have been used as gaming pieces, but thrown away as detritus. Pieces 2-86 and 2-39 have saw marks on both ends without any sign of polishing; perhaps the makers intended to finish them, but for some unknown reason, did not. Artifact 3-14 has been longitudinally broken, and obviously thrown away. These bone segments are usually longer in overall length than the average gaming piece, with an irregular, uneven outline. The size range is weight 0.8 g - 3.3 g; length 12.7 mm - 50.5 mm; thickness 2.4 mm - 4.4 mm; width 10.8 mm - 17.5 mm.

__Stage 4:__ (Fig. 4-1 E)

This stage is represented by the largest number of specimens. There are 38 pieces of Type A gaming pieces in this category. These pieces have been sawn into sections, snapped, and then polished along their ragged edges. In most cases the striations produced by the polishing of their edges are still visible; they are generally multi-directional, and were probably created by a fine basal polishing tool. Some striations have been obliterated, probably due to excessive handling.

Artifacts 3-16, 3-10, 2-91, 2-87, 2-85, 3-178, 3-173, 3-172, 2-263, 2-96, 3-18, 3-168, 3-167, 3-166, 3-161, 2-92, 2-49, 2-60, 2-41, 2-88, 2-59, 2-65, 2-89, 2-38, 3-159, 2-68, 3-164, 2-34, 3-170, 3-169, 3-19 all exhibit a generally square/rectangular shape, with visible saw marks along the distal and proximal ends and with signs of polish striations along the jagged snap ends. Artifact 3-171 seems to be the only example of a gaming piece made from a bird bone, and 2-84 and 3-11 have been broken along their vertical axis.

Three pieces (3-17, 2-61 and 2-90) have saw marks on only one end; the other is polished to form a rounded blunt point with a beveled wear/polish pattern. It could be that these artifacts originally had a function other than as a gaming piece. Gruhn mentions in her 1961 report the presence of bone rubbing tools. They were long splinters of bone with edges polished by wear (p. 91). Perhaps these small square beveled gaming pieces were once rubbing tools, that once broken, were converted into gaming pieces. Their unusual wear pattern certainly implies that they could be more than just gaming pieces.

The gaming pieces in stage 4 of the production sequence are generally smaller and more regular in shape, with evidence of polishing but no decoration. The size range of this category is weight 0.9 mm - 2.8 mm; length 15.3 mm - 36.8 mm; thickness 1.9 mm - 6.1 mm; width 7.3 mm - 21.0 mm.

Stage 5: (Fig. 4-1 F)

There are 22 gaming pieces in the final stage production. All of these artifacts have either been coloured, incised, or drilled in some manner to decorate or identify it in some manner.

A. COLOURING:

Thirteen pieces (3-15, 3-177, 3-176, 3-163, 2-84, 3-165, 3-8, 2-33, 2-64, 3-162, 3-12, 3-5, 3-175) have been coloured by some means, but show no evidence of incision or drilling.

OCHRE: six pieces have been coloured using ochre, five with red and one with yellow ochre. The pigmentation can generally be seen on the ventral surface, caught in the pocketed trabecular surface. The entire surface area of the piece may have originally been covered in ochre, but the colour has worn off over time.

BURNING: The four remaining pieces (2-33, 3-8, 2-84, 3-163) have been coloured using the medium of fire. They have been smoked; or burnt black, dark brown, or white in colour. Three gaming pieces have been decorated using

SMOKE: Pieces 3-12 and 3-5 have a series of thin bands, horizontally arranged parallel to each other across the width of the pieces. The technique may have involved drawing a small flame across the surface of the pieces. Artifact 3-12 has three parallel bands and 3-5 has six of black, all generally the same length. Gaming piece 3-175 has a diagonal band of black smoke across both surfaces. This design was likely created by holding the piece over the smoke by its two opposite corners, which would not be stained, creating a diagonal black band.

Artifact 2-33 is interesting in that it has a diagonally sawed groove across its ventral surface which has been filled with black dirt and pigment, but then redefined. There are striations through, rather than under the groove. Why would someone redefine this groove by sawing through the dirt instead of letting it fill solid?

B. NOTCHING:

Four gaming pieces (3-3, 2-93, 2-94, 3-7) have been notched along their parameters, with small v-shaped grooves concentrated generally along the sides. In most cases the notching has been done by applying pressure to the gaming piece at about a 45 degree angle with a pointed tool, creating a fan-like depression (2-93, 3-3). All the notching is probably done using the same tool; but at varying angles, creating a wedge effect. The number of notches ranges on one side from one to eight, with a total maximum of 15 and average of six. The notches are no more than 1-2 mm in width.

Piece 3-7 has only one small notch on its dorsal lower left side, suggesting that the piece was not notched entirely around its parameter at one time, and implying that these pieces could well have been utilized as some kind of counting device.

C. BORED:

One gaming piece (2-67) has a circular hole drilled through the center from both the ventral and dorsal faces. The hole is 5 mm wide on the dorsal and 4.5 mm on the ventral face. This kind of gaming piece strongly resembles Fremont type gaming pieces found in Utah (Madsen and Lindsay 1977:101 a; Dalley 1976: 55, fig., 22 d; Marwitt 1968:53 a). Madsen and Lindsay (1977:71), have also suggested that these gaming pieces may have been bored in order to suspend them and wear them as jewelry.

Gaming piece 2-37 has a large 7.5 mm hole bored almost but not quite through its center (the hole reaches the trabecular surface on the other side). It may be that this piece was intended to be like 2-67. They are similar to gaming pieces from Pharo Village, Median Village, Swallow Shelter, and Cowboy Cave (Jennings 1980:103, fig., 42; Dalley 1976:55, fig., 22; Marwitt 1970:101; 1968:53, fig., 67).

D. INCISING:

The remaining three decorated gaming pieces of type A have been incised, either in a lined pattern, or in a shallowly drilled pattern (2-95, 2-62, 3-174). A piece resembling 2-95 was found by Jennings (1980:103, fig., 42 b) at Cowboy

Cave. The pattern on the Cowboy Cave specimen matches almost exactly that of the P/W gaming piece. There is a semi-circular arrangement of drilled holes on the lower half of the piece, with two or three horizontal lines above it. This pattern does not appear to be a coincidence, since there is a third matching specimen from Backhoe Village (Madsen and Lindsay 1977:70, fig., 41 k). The only difference with this third specimen is that it has a hole drilled through the top of the piece, probably for suspension.

There are too many similarities between the shape and design of the Utah Fremont gaming pieces and those found in Wilson Butte Cave to be coincidental. The large numbers of these gaming pieces demonstrates that they could not have been scavenged or traded for. The lack of any kind of bone gaming pieces in Shoshone sites means that they could not have been made by the Shoshone. The only feasible explanation is that they were made and used by a Fremont group occupying the cave.

TYPE B: Elongated Rectangular Form

Type B gaming pieces are defined as more than twice as long as they are wide. The function for both type A and B gaming pieces is presumably the same, being used as a gaming piece or counter in some kind of game. The variation in shape might indicate that they were used in two different games, or that they had different values for the same game. As Table 4-1 demonstrates, there is not much range of dimensional variation within type A pieces; therefore the unusual variation in the length of a type B gaming piece suggests that these two stylistically different types of gaming pieces might have had slightly different functions

Due to the small numbers of this type of gaming piece, it is difficult to reconstruct reliably a manufacturing sequence for type B. One piece, 3-158, has saw marks on only one end; the rest show no signs of any saw marks, suggesting that type B gaming pieces were produced using a different method than type A. Artifact 3-165 seems to have been made from a piece of flat bone that was broken then polished to form the elongated spatula shape. Specimens 2-110, 2-35, 2-36 and 3-4 (which is broken) have been made from split long bones, a process similar to stage 1 and 2 of type A.

Artifact 2-110 and 3-158 have an unusually beveled end, as if used as some kind of scraping tool, which has been used at several angles to create a beveled wear pattern. All pieces have generally vertical striations running their length, probably produced by the process of cleaning the bone during its initial stages of production, with rounded although slightly uneven ends. Piece 3-156 is the most unusual, since it is the largest of the group and has been decorated with red ochre. Its shape is flat and oblong rather than thick and rectangular; there are no wear facets visible.

These longer gaming pieces are found in many Fremont sites in Utah: examples are Sudden Shelter (Jennings et al 1980:152, fig., 70 b), Swallow Shelter (Dalley 1976: 55, fig., 22 b), Snake Rock Village (Aikens 1967b:27, fig. 22 a and b), Bear River No. 2 (Aikens 1967b:53, fig., 43 n), Hogup Cave (Aikens 1970:89, fig., 48), Median Village (Marwitt 1970:101, k-p), Caldwell Village (Ambler 1966:58, fig., 48 aa & cc), Pharo Village (Marwitt 1968:54, fig., 67 c), and Bull Creek (Jennings & Sammons-Lohse 1981, fig., 39 c & e).

Obviously both type A or B have been demonstrated by numerous examples to be specifically Fremont in origin. These types of gaming pieces, do not occur in such numbers in any other cultural domain. The lack of substantial numbers of gaming pieces in Shoshone sites, (one or perhaps two at the most), implies that they may be a product of scavenging; or a product of Fremont occupation. Baker Caves I and III, Shoshone sites in Southern Idaho, produced only two undecorated gaming pieces (Plew et al 1987:74, fig., 20 g-h); and no gaming pieces were found in the Birch Creek rock shelters, which are considered "classic" Shoshone sites in southern Idaho (Swanson 1972). The presence and number of gaming pieces in the Wilson Butte Cave assemblage is one of the most convincing lines of evidence supporting the theory of a Fremont occupation in southern Idaho.

B. BONE AWLS

There are 20 bone awls in the P/W collections. One is an ulna awl, four are scapula awls, and the other 15 are splinter awls. The dimensions of the individual awls appear in Table 5. Awls are artifacts that have been whittled or ground to a point to perform a piercing or punching function. This might include the piercing of hide in order to run sinew through it, or the sewing together of coiled baskets, or pressing off flakes from a lithic tool. The wear pattern on the P/W awls suggest a punching, perforating function, probably through hide, rather than for flint knapping, (these tools will be discussed in a later section).

The ulna awl (3-20) has its proximal end intact, whereas the head or styloid process has been removed and the shaft polished to a point. The tip, or use-end, is beveled and encircled by short striations across the long axis, approximately 20 mm up the shaft. These striations were probably created by grinding the sides of the point to attempt to resharpen, or shape the awl. The striations surrounding the immediate area of the tip have been obliterated due to use-wear polish. The entire length of the ulna awl shaft is covered with vertical striations, probably caused by an initial attempt to clean the bone.

Four awls seem to have been produced using the spinal ridge area of the scapula. In all four cases the awls have been shaped from the thick spinal ridge of the scapula, and the point ground from the acromion region. The broken spinal region has not been entirely cut and smoothed; 2-100 has been modified up to 75 mm from the tip on one side and 31 mm on the other. The striations on these edges indicate a perpendicular as well as longitudinal motion of grinding to form the tip of the awl.

Artifacts 2-114, 2-112, and 2-107 are derived from the natural point of the spirally broken piece of scapula spine. This point is then ground and polished smooth, mainly from the dorsal side (the side with the spine); and sharpened into a point. The striations near the tips of all these awls are vertical, the tip itself smooth from use-wear. The rest of the bone section is relatively unaltered.

The remaining 15 awls have been made by sharpening already broken and naturally pointed bone splinters. Two of the awls (3-153 & 2-115) have red ochre adhering to their surfaces. This feature is interesting since ochre is usually associated with "ceremonial" rather than tools with domestic functions. Only one awl (2-113) has been broken more extensively than just a missing tip.

There is variation in the length and shape of the tips of the awls. Artifact 2-113 is missing its entire tip; but it is assumed to be an awl, due to the vertical striations surrounding the tip area, and the general shape of the artifact. Awl 2-115, like 2-113, has been made from a long bone of a medium -sized bird. Number 2-115 has a stubby point tip; stubby meaning that the awl has wide shoulders directly before the narrower active tip of the awl, creating a nipple-like appearance. The active tip area of this awl is 7 mm in length; and shows no sign of striations, probably due to extensive use-wear polishing. The dorsal surface as well as the sides have been polished in a horizontal manner, perpendicular to the tip. This awl has remnants of red ochre towards its distal or handle area. The surface area of this tool is highly polished due to extensive use.

Awl 3-152 also has a stubby tip. Its tip protrudes only 3 mm from its shoulders. Again the tip itself has no striations due to use, but the dorsal surface and sides of the shoulder area have horizontal striations like 2-115. The rest of the tool is relatively unmodified.

Artifact 3-150 is a large awl (117 mm in length) made by shaping the massive end of a large long bone. This long bone is not split, unlike every other splinter awl. The tip is encircled by vertical striations; its relatively smooth outline indicates that it had a long use life.

Awl 3-148 is also well polished from use; the splinter shows no indication of scraping striations (probably worn away from excessive handling). The visible striations have been produced by a piercing action, creating parallel striations along the length of the shoulders. Artifact 2-105 is another well used awl, the smallest in the collection. It is almost bullet-shaped, with the body of the awl merging into the tip in a convex shape. Striations are generally longitudinal like most other awls. There is no indication that this tool was hafted; although it is small, (only 34 mm long), it was probably hand- held.

The degree of modification of the remaining splinter awls varies from 27% to 83% up the shaft of the bone splinter. Like the other awls in the P/W collections, the points have been formed by grinding the splinter in a fashion perpendicular to the point (back and forth rather than an up and down action). All awls have longitudinal striations indicating that they were used to pierce, poke, or puncture skins, or perhaps other materials. Artifact 2-104 and 3-149 are missing their tips and 2-97 is blunt at the tip; all others have tips straight, converging or concave-converging in form. The tips originate from various points along the length of splinter. 3-153 retains some evidence of red ochre on its dorsal right side towards the distal or handle area of the awl.

C. FLINT KNAPPING TOOLS

Four bone objects, made by modifying antler tangs or long bone segments, have use-wear patterns indicating a pressure flaking function for making lithic tools. All specimens have rounded blunt ends. The striations near the use-wear end are multi-directional, and generally limited to a small surface area of the rounded tip. Artifact 2-40 has a small obsidian chip embedded 4.5 mm from the shoulder of the tip in the middle of the dorsal face; substantiating the conclution that these artifacts are flint knapping tools.

Artifacts 3-151 and 2-99 are made from the interior portion of antler; 2-99 was found by Perron in two pieces and glued back together again.
Artifact 3-151 lacks any visible sign of modification along its shaft; its use wear, like the other flint knapping tools, is limited to the round blunt area of the tip. Aikens describes similar kinds of awls from Hogup Cave (1970:87, fig., 47 a-h, especially c-g).

D. BOW

Artifact 2-217 has been made by grinding and polishing the ends of a split segment of mammal rib. The bow has been narrowed 3 cm from either end of the bone, and lashed with sinew. The rib bone segment is naturally convex, making it well suited for the function of either a fire or drill bow. I do not believe it could have been for shooting arrows, since it is too small. Striations are visible near the lashed ends of the bow; the ends may have been roughened to create a better surface for the sinew to grip. The bone bow has been gnawed by small- and medium-sized rodents near the proximal end of the dorsal right side.

E. BONE TUBES OR BEADS

This category includes seven artifacts. Three of them (2-102, 2-103, 2-101) are segments of polished hollow long bones of birds. These long bones have been divided into sections, not unlike the process of making gaming pieces. The bone has been sawn around its circumference, then snapped and polished. The saw marks are still visible. These bone tubes were probably suspended and used for personal decoration. Three tubular beads similar to those from the W/P collection were found by Gruhn (1961, plate 21, A-C) in Wilson Butte Cave in 1959-60. The manufacturing process of these beads is described in detail by Schmitt (1990: 119, fig. 46). The way in which these beads decorated clothing can be seen in Aikens (1970:92, fig., 52).

Artifact 2-116 is a wapiti or elk tooth pendant. The tooth has been biconically drilled from both the dorsal and ventral faces. The tooth is highly polished; but there are occasional striations on the bulbar area of the pendant, probably produced by the suspended tooth "banging into things." Elk teeth seem to be an important element in Fremont decoration. The Pillings figurines from the Fremont range and Fremont Creek drainages (Peabody Museum, Harvard University), suggest that women wore necklaces with pear-shaped and discoidal elements (Wormington 1955:89, fig., 49); and it has been suggested that these pear-shaped elements represent wapiti or elk teeth, examples of which are found in Hogup Cave (Aikens 1970:89, fig. 49).

The last two beads, 3-155 and 3-154, are roughly rectangular in shape, and resemble type B gaming pieces in both form and finish; but both of these artifacts have been drilled for purposes of suspension. Bead 3-154 has two small shallowly drilled holes above the main suspension hole, which has been bored all the way through the bone. The first shallow hole is directly above the main hole (4 mm); and the other, the same size, is 2 mm above and to the right of the first.

The ventral surface of this same pendant has been [illegible] black (probably by smoke) to a maximum of 16 mm above the large drilled hole and the break.

For pendant 3-155, the dorsal surface has no decoration; most of the trabecular material has been scraped away and polished. The dorsal left side (in the middle) has been serrated with 14 small notches. These types of pendants are common to Fremont sites in Utah: Median Village (Marwitt 1970, fig. 70 k-o) and Cowboy Cave (Jennings 1980 fig. 42, 0). Aikens (1970) reports similar pendants from Nephi (Sharrock and Marwitt 1967:37, fig. 42, o); from Turner-Look site (Wormington 1955:54); Injun Creek (Aikens 1966:51); and Snake Rock (Aikens 1967b:27). These types of pendants are rare in Anasazi sites, and no artifact comparable to these have ever been found in any Shoshone-associated site in southern Idaho.

Artifact 3-157 is a cut segment of bone that may or may not be bird. Both ends have been sawn and snapped, like the hollow beads. Neither the ends nor the surface has been ground and polished, suggesting that this artifact is in the initial stages of manufacture. Perhaps it was not intended to be a bead; since the bone is massive, not hollow; (although no sign of trabecular material) it may have been a blank for a pendant or a type B gaming piece.

F. MISCELLANEOUS BONE ARTIFACTS

This category includes those artifacts that could not be put into any other bone classification. No other comparable artifacts can be found in other assemblages either in southern Idaho or Utah. Artifact 3-179 has been made from a piece of flat bone. Both faces are covered in fine longitudinal striations, indicating that the bone surface was cleaned and smoothed in the process of making the artifact; the artifact, however, has been broken at one end. It has been serrated by a series of small marginal notches. There are 20 V-shaped notches in total, including two attempted but not carried through. A small section of bone has peeled from the ventral right side. The "teeth" of the serrations vary from 4-5 mm to 1.5 mm in width, and are rectangular in shape with blunt tips. The v-shaped grooves have been sawed from both ventral and dorsal surfaces. Gruhn (1961, plate 21, e) found a similar artifact during her 1959/1960 excavation, and suggests that these artifacts might have functioned as combs (suggested by the use-wear polish in the grooves and on the tips of the teeth). Interestingly there is ochre on the dorsal surface of this so-called comb, implying that if it were used as such, the cave occupants were putting ochre into their hair.

Artifact 2-31 is also a flat rectangular segment of bone. This artifact has nine complete and four incomplete shallow holes on the ventral surface, arranged in a "zig-zag" pattern. Both faces are covered in fine longitudinal striations. The dorsal surface show a v-shaped arrangement of flat-bottomed drilled holes (the bit used for drilling must have been blunt, not sharp). The "zig-zag" pattern continues in a full "W" formation; but is broken along the outer edges of the "W," accounting for the four incomplete holes. The ventral surface has this same pattern, with drilled holes that are conical in cross-section, implying that the artifact was drilled using two different drill bits. If one holds this artifact up to the light, one can see the "zig-zag" pattern on the ventral surface, creating a cross effect on the dorsal surface; the pattern is like a "DNA" type pointed spiral. It is unknown whether this "DNA spiral" was an intentional or coincidental design; no other artifact like this one has been described.

The final miscellaneous artifact (2-66) is a triangular-shaped flat segment of bone, relatively rough in outline. Both ventral and dorsal surfaces are striated, and the dorsal surface shows an arrangement of three incised lines arranged parallel to each other. These lines seem to have been intentionally incised, since the same line has been scratched repeatedly to make it bolder. There are also two smaller striations from the dorsal lower left corner; it is uncertain whether or not these were an intended part of the design, since they do not seem to be as intentional as the above markings.

CONCLUSION

Assessing the bone assemblage of the P/W collections as a whole, one can see that there are elements that could conceivably belong to both the Fremont and Shoshone material culture. Awls and polished bone tubes have been found in the Birch Creek sites (Swanson 1972, fig. 59, 60) and at Baker Caves I and III (Plew et al 1987, fig., 18 a-d and 19, a-f). However, these sites are missing gaming pieces. Even though an occasional gaming piece has been found in Shoshone sites in southern Idaho, they have never been found in any great numbers, a phenomenon associated only with Fremont sites in Utah. There are over 80 gaming pieces found in Gruhn's collections (1961; 1992 in press) and the P/W collections from Wilson Butte Cave. This kind of gaming piece concentration is literally unheard of for any southern Idaho site. There are also a number of type A & B gaming pieces with specific designs that can be identically matched with confirmed Fremont gaming pieces. Also important to note is the presence of a gaming piece production sequence at Wilson Butte Cave. Even if there was Fremont-Shoshone contact between the two regions, the Shoshone would have traded for only the finished article. What would the Shoshone have done with them even if it were possible to get gaming pieces from Utah; they used wooden sticks for their games, not bone pieces.

A high concentration of splinter type awls is also associated with the Fremont culture (Wormington 1955:176); this type constitutes 75% of the awls in the P/W collections. The Shoshone material culture generally has some splinter type awls, but is known more for whole shaft or ulna awls (Lowie 1909).

Even though the P/W collections have a Fremont type wapiti or elk tooth bead, there is also one at the Birch Creek sites (Swanson 1964:131, fig., 60 t). Either a Shoshone or a Fremont could have lost this bead, since elk teeth were important in the dress of both cultures. The same would go for the bird bone tube, as they are also found at both sites.

The presence of bone artifacts like ulna, whole shaft, and splinter awls, as well as flint knapping tools and the bow, are common to both the Shoshone and Fremont material culture; and could represent either group's occupation in Wilson Butte Cave. However, there are high frequencies of specifically Fremont artifacts like type A and B gaming pieces, splinter awls, and pendants identified as Fremont in Utah sites. It has been demonstrated that these Fremont artifacts were made and used in the cave, and in large numbers. The presence of these bone artifacts strongly supports the hypothesis that the Fremont once occupied Wilson Butte Cave.

CHAPTER 5: OTHER PERISHABLES

Introduction

The Perron/Webb collection contains a total of 44 artifacts made from perishable raw material other than bone. These other raw materials include wood, cane/reed, vegetal fibers such as bark or grasses, and animal material such as sinew or hide. The artifacts are categorized according to their raw material and assumed function, deduced through comparison with perishable artifact assemblages from the Great Basin. Those artifacts that do not have an obvious function are assigned to the miscellaneous category. This chapter divides the perishable artifacts into categories such as wooden knife or scraper handles, bows, arrow or atlatl dart shafts, reed matting, cordage, and various artifacts made mainly from cordage, as well as leather artifacts such as a moccasin and possibly a pouch. There are a number of artifacts made from a composite of these various raw materials. There are no examples of woven matting or basketry in the P/W collections, but the fragment of coil-and-bundle basketry found in the 1989 Wilson Butte Cave excavations by Gruhn and Bryan will be discussed, because of its established Fremont origin.

A. WOODEN ARTIFACTS

Twenty-nine artifacts in the P/W collections have been made from wood or cane. This category contains finished wooden artifacts as well as the wooden byproducts of manufacture. The kinds of artifacts described includes two knife or scraper handles, two bows, 15 segments of arrow or atlatl shafts, nine pieces of production detritus and two cane artifacts. The specific identification of wood species used for these artifacts was not possible; it is assumed, however, that most of the species identified by Gruhn (1961) will be represented in the P/W collections. Gruhn collected a total of 42 artifacts of wood and 60 fragments of cane from Stratum A of Wilson Butte Cave in 1959/60. (p. 102) An example of the kinds of wooden raw materials, associated with the number of artifacts they were used for, has been reproduced from Gruhn's report to provide an example of the kinds of woods likely used to make the P/W artifacts:

Ribes aureum, golden currant - 11 artifacts,	**all game counters** **arrow shaft** **fire drill shaft**
Artemisia tridentata, sagebrush - 10 artifacts,	**arrow shafts** **fire drill shafts (all foreshafts)**
Phragmites communis, cane - 8 artifacts,	**nock end of shafts** **socket ends of cane mainshafts** **mainshaft pieces**
Crataegus rivularis, hawthorn - 6 artifacts,	**all notched wooden points (4)** **arrow shafts (foreshafts) (2)**
Salix scouleriana, willow - 3 artifacts	**firedrill shaft**
Ribes montigenum, prickly currant - 2 artifacts	**arrow shaft**
Sarcobatus vermiculatus - greasewood - 2 artifacts	**arrow shaft** **fire drill shaft**
Chrysothamnus viscidiflorus, rabbit brush - 1 artifact	**misc.**
Juniperus sp., juniper - 1 artifact	**misc.**
Populus angustifolius, narrow-leaf cottonwood - 1 artifact	**misc.**
Betula fontinalis, river birch - 1 artifact	**fire drill shaft**
Pseudotsuga taxifolia, Douglas fir - 1 artifact	**misc.**
Abies sp., fir - 1 artifact	**misc.** (Gruhn 1961:110).

2 unidentified hardwood arrow shafts
There were also 53 undecorated fragments of cane, probably from arrow shafts (p. 105)

> "Some of these plants which were chosen for use are to be found in the surrounding desert - rabbitbrush (Chrysothamnus viscidiflorus), greasewood (Sarcobatus vermiculatus), and sagebrush (Artemisia tridentata). For other woods, however, the late prehistoric peoples evidently resorted to the foothills and stream valleys, the natural habitat of golden currant (Ribes aureum), hawthorn (Crataegus rivularis), river birch (Betula fontinalis), and narrow - leaf cottonwood (Populus angustifolius) (Davis 1952). Cane (Phragmites communis) was also evidently gathered in moist places. Single specimens made of

coniferous forest plants like Douglas fir (Pseudotsuga taxifolia) and fir (Abies sp.) suggest collection of raw materials in the mountains: prickly currant (Ribes montigenum) is also a high altitude plant (Davis 1952:378) (Ibid).

The main source of raw materials for the cordage and the arrow shafts seems to be sagebrush (Artemisia tridentata) , bark for the cordage, and arrow cane (Phragmites communis) for the foreshafts. Some of the methods used to create these artifacts include whittling; deep circumference cutting, snapping, and smoothing. Artifacts are grouped for discussion according to similarities in overall appearance, function, and raw material. Measurements of individual wooden artifacts are provided in the Appendix (table 5).

I. KNIFE OR SCRAPER HANDLES

Number of specimens: 2

The P/W collections have two knife or scraper handles (2-133 and 3-183). They both have a generally elongated rectangular to tubular outline. They are made from unidentified species of hardwood, bark, or sinew bindings with some kind of black tar-like resin used on the work end of the handle to affix the lithic tool. Both handles have been cut, whittled, and smoothed, with U-shaped notches at one end to hold the lithic artifact.

The body of handle 3-183 is slightly curved, with a V-shaped nick towards the end of one side, 3 cm above the base (7 mm in depth and 4 mm across). This nick might have been useful for suspending the tool from some kind of line or belt. The notch made to hold the tool, at the other end of the handle, is generally U-shaped; and cut no more than 20 mm into the shaft. The notch contains the broken remnant of the original chert tool; unfortunately there was not enough of it visible to make a guess concerning its function. The chert tool had been inserted into the notch, then wrapped with sinew and secured with a reddish-brown coloured resin. Based on the curvature of the body, I speculate that it was probably used as a knife handle, since a curved handle would be more useful when cutting something.

Handle 3-133 is a smooth straight cylindrical shape with a rounded convex base. The notch is a slender V-shape (11 mm in depth and 5 mm across). The tangs of the notch show a thick encrustation of black resin that probably covered part of the sinew bindings and well up the length of the tool. The sinew binding around the proximal end has dried and shrunk over time; and the area where the sinew originally was shows a lighter coloured wood than the handle itself, which has been ingrained with dirt, smoke or oil, demonstrating that this handle has been in use. There is no evidence of the original tool remaining in the handle. This handle is smaller and thinner that 3-183; and lacks any kind of body curvature, perhaps suggesting that it may have been intended as some kind of end scraper handle.

Plew et al (1987) describes a knife or scraper handle from Baker Caves I & III in southern Idaho. The handle is made from an unworked length of hardwood crudely split at one end. The tool was affixed by a small length of cord rather than sinew, and there is no evidence of resin (Fig. 23, c, P. 81). Plew et al assume this handle to be Shoshone in origin; it does show considerable morphological and technological variation from those found in Wilson Butte Cave. Shallow Shelter (Dalley 1976:, fig. 29) in northern Utah has examples similar to those of Wilson Butte Cave (Great Salt Lake Fremont Variant area). Hogup Cave also has examples of handles; but they seem to be short, squat, and made of bone not wood (Aikens 1970:95, fig. 58 a, b).

Due to the poor preservation of perishable artifacts in open air sites in southern Idaho, we do not have a large collection of perishable artifacts with which to compare [illegible] specimens. The ethnographic record of the Shoshone does not mention the kinds of handles they made for their tools; only that their material culture was not noted for its excellence (Spencer and Jennings 1965:279). The difference in workmanship of handles from the Baker Caves and P/W examples does imply perhaps a difference in technology rather than function, and perhaps also of cultural origin.

II. BOWS

Number of specimens: 2

Two kinds of bows are represented in the P/W collections. Both are made from the same kind of wood (species unknown). The smallest bow (2-218) has been made from a flat convex section of wood. The section of wood has been whittled along the sides to create gradual points at each end for the attachment of the bow string. Two-ply s-twist sinew twine is still wrapped around one end of the bow. The size of the bow implies that it was too small to be for arrows; it was either used as a fire or drill bow or as a toy bow (D. R. Tuohy, 1991, personal communication).

The morphology of the largest bow (2-136) suggests that it was one section of a composite bow. Artifact 2-136 is similar in shape to 2-218, except that one end is not pointed but paddle-shaped. This thinned flat end was shaped in such a way as to fit with another paddle shaped end from the other section of the composite bow, and lashed together with sinew or cordage. It is similar in shape and size to one found by Perron on Browns Bench, and described by James Woods (unpublished); except that 2-136 does not have a hole bored to facilitate the tying together of the sections. The extrapolated total length of the composite bow is ca. 90-100 cm. I have been unsuccessful in finding examples of composite bows from Idaho, or from the Great Basin.

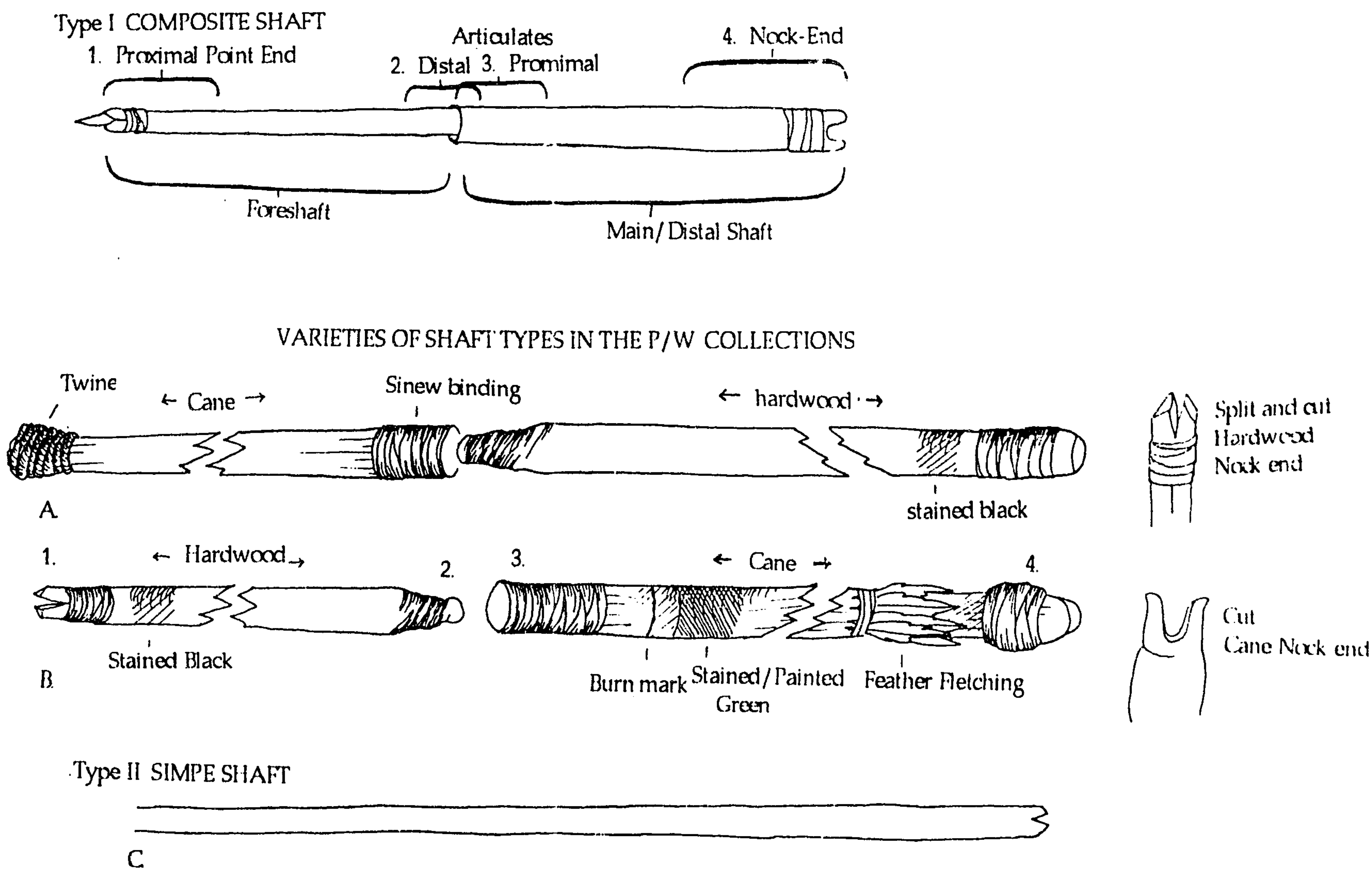

Fig. 5-1 The variety of Arrow Shaft types present in the P/W Collections

III. ARROW/ ATLATL DART SHAFTS (fig. 5-1)

Number of specimens: 15

Woodworking techniques ·ed in producing these arrow/dart shafts and the byproducts include splitting, whittling, shaving; deep circumference cutting and snapping; abrasive smoothing, a specialized method of forming notches in arrow and dart shafts; and a peculiar spiral rasping technique used primarily to roughen the proximal end of dart and arrow fore shafts (Dalley 1970:153). The shaft segments have been classified according to morphology and presumed function, or place in the construction of the composite (or simple) arrow or dart shaft.

There seem to be two different kinds of shafts represented in the P/W collections: simple and composite. Composite shafts are those that are made up of more than one component, and joined together to make a complete shaft. The simple shaft is a single unit.

COMPOSITE SHAFT

The most common type of shaft in the P/W collections is the composite shaft. A composite shaft is generally made up of a cane mainshaft (fig. 5.1), and a hardwood foreshaft. The mainshaft has a hollow socket proximal end and a notched "nock" distal end for the bow string. Both ends of this cane mainshaft have been wrapped with sinew so as to prevent splitting during use. This is the section that would have fletching, if any (feathers tied to the shaft to stabilize it in flight). This section also seems to have the most decoration, using paint, ochre, scratching, or burning; perhaps in order to identify it from another man's or group's arrow.

The foreshaft of the composite bow is generally made from hardwood, being massive in the middle, not hollow. The articular end of the foreshaft is usually whittled spirally to form an elongated cone shape. This spiral cone end is fitted into the hollow socket end of the mainshaft, and secured by lashing sinew around the join area. The proximal end is split for the placement of the projectile point (presumably before the shafts are fitted together); it is secured in place with sinew lashings. There may be variation in the types of raw materials used in the construction of the composite shafts, but I believe the general construction remains the same (Fig. 5-1, Type I A). Figure 5.1 is based on the specific examples in the P/W collections. There is probably a wide range of shaft decoration designs, but this illustration is based entirely on the examples of shafts in the Wilson Butte Cave assemblage (both the Gruhn and the P/W collections).

Figure 5-1 illustrates two possible reconstructions of composite shafts, using hardwood or cane for either the foreshaft or the mainshaft. Each end of the shaft sections was found separately (Type I - 1, 2, 3 & 4); therefore the diagram was constructed using shafts from other sites in the area (Juell 1990; Hester and Milner 1974; Janetski 1980: Dalley 1970), and through personal communication with Don Tuohy (1991).

1. <u>MAINSHAFT Cane (fig., 5-1 type I B (3&4))</u>

The mainshaft is the distal section of the composite shaft. The cane mainshaft has a nocked distal end and a hollow articular proximal end. The articular end is fitted over the spirally whittled hardwood section of the foreshaft and held in place with sinew lashing.

NOCK END: Artifacts 2-128, 2-126, 2-123, 2-125, 2-134 are the nock ends of cane mainshafts. The nock is cut just after a natural join in the cane. The cut is U-shaped, with widening convex sides (polished smooth). The nock is 2 - 5 mm wide at the top and 3 - 5 mm deep. Directly below the nock, the shaft is wrapped in sinew to prevent splitting. This sinew is still present in artifacts 2-125, 2-123 and 1-126. Artifacts 2-123, and 2-126 have been covered (shaft and sinew) by an orange paint; 2-128 has a band of red paint or ochre 36 mm from the nock end. All three of the coloured nock ends have diagonal striations below the sinew area, and presumably underneath it, perhaps placed with the intention of providing a rougher surface area for the sinew to grip. This feature is something Janetski calls "scarification of the reed" (1980:80) for sinew wrapping; and is seen in samples from Juell (1990:129) and Gruhn (1961, plate 24, a & b).

Artifact 2-134 is a long section of the cane mainshaft showing the nock end and remains of the fletching. Thirty mm below the nock end there are remains of small feathers adhering to the cane surface, held in place by resin. This sample may have looked like the one in Gruhn (1961, plate 24 a). The feathers would have been used to stabilize the shaft in flight, and may also have had some decorative function. Therefore, it is difficult to classify this particular section as anything other than a nock end, and the specimen confirms the classification for all other segments with the same morphology. These artifacts have been compared with others in the Great Basin and surrounding area (Aikens 1970:160, fig. 118 a-e; D. R.Tuohy personal communication; Gruhn 1961:104 & plate 24 a) to confirm this classification.

2. <u>PROXIMAL SECTION OF MAIN SHAFT Cane (fig. 5-1, Type I B, 3)</u>

The P/W collections has three examples of the proximal articular end of the mainshaft. This section is hollow for the insertion of the hardwood spirally-grooved foreshaft. The cane section has sinew lashed over the end to secure the hardwood foreshaft and mainshaft together. The binding would also have prevented the cane from splitting due to the force of impact while the shaft was in use.

Artifacts 3-182 and 1-130 show no evidence of decoration. The sinew binding varies from 11 mm to 30 mm in width. Number 2-132 has a sinew band 41 mm in width, if not more (some of it has become unraveled). These sections have the same kind of scarification as the cane nock ends, demonstrating that they were once part of the same section of arrow shaft.

Artifact 2-132 has a line burnt around the circumference of the shaft approximately 15 mm from the bottom of the sinew. The burn mark was probably a decorational element. A band of light green/mint paint is present 15 mm from this burnt line. Examples of this kind of shaft segment are described by Aikens (1970:164, fig. 118 g-i) and Gruhn (1961: plate 24 m).

3. <u>FORESHAFT Hardwood (Fig. 5-1, type I B 2)</u>

There are two examples of the distal articular end of hardwood foreshaft. Artifacts 2-121 and 2-131 have a distinctive spirally-whittled cone-shaped distal end which have been carved in order to fit snugly inside the socket end of the mainshaft. The length of the tapering section is from 16 mm to 21 mm, ending in a very slight knob. This type of foreshaft articulation has been described from Cowboy Cave (Janetski 1980:80; Dalley 1970:, fig. 117). These shaft sections may also have been intended for atlatl dart shafts as well as arrow shafts, due to the thickness of the wood used.

4. <u>FORESHAFT - PROXIMAL SECTION Hardwood</u>

The proximal end of the foreshaft is the end in which the projectile point is inserted and secured. Generally the proximal end has been split, with the arms of the split end being polished or ground in some way so that the end of the stick is beveled to become flush with the point when it is inserted. After the point is put in place, the end is bound with sinew to secure it, and to prevent the shaft from splitting due to the force of impact.

Artifact 2-119 has a 20 mm width of sinew binding, as does 2-120; but 2-118 is missing the sinew binding. There are signs of black colouration on 2-120 below the binding; this may be due to smoking, or perhaps decay. Artifact 2-119 seems to have been intentionally cut approximately 40 mm from the proximal end. There were no projectile points found still attached to their shafts. Gruhn (1961: plate 24) and Dalley (1970: fig., 120) describe use of a wooden point inserted into the foreshaft; "these wooden points from Wilson Butte Cave were inserted in a haft, and probably used a projectile points (Gruhn 1961: 102). The P/W collections have no examples of this kind of wooden projectile point, but it does have one made of cordage (fig. 5-1 , type I A 1). This blunt point is made from a length of cane that has been wound with single-ply cordage to form a cone shape, the widest part of the cone at the end, or tip of the point (2-124). This type of projectile point was probably intended to hunt birds or small animals.

DISCUSSION: Compound Shafts

Figure 5.1 type I A shows an alternative configuration for the composite shaft, with the main shaft constructed of hardwood, and the foreshaft of cane. There is only one example of a cane foreshaft (2-124), but this seem to have had a specialized purpose. Therefore, I provide a generalized reconstruction of the elements and raw materials involved in the construction of a composite shaft, using examples only from the Wilson Butte Cave assemblages.

Arrow shafts have been found in several sites of the Great Basin: Hogup Cave (Dalley 1970:160); Cowboy Cave (Janetski 1980:80) Spencer (1974:48); James Creek Shelter (Juell 1990:129); Danger Cave (Jennings 1957:189). Parts and fragments of composite arrow shafts have been recovered in dry caves and shelters throughout the Great Basin, including Lovelock Cave (Loud and Harrington 1974:120-125); Promontory Caves (Steward 1937); Humboldt Cave (Heizer and Krieger 1956:23); Hidden Cave (Pendleton 1985: 255); and in Wilson Butte Cave (Gruhn 1961: 102-106). There has not been enough work done, however, on the analysis of arrow shaft decorations. We know that both the Fremont and the Shoshone had bow and arrow technology, using both composite and simple arrow shafts. Unfortunately we cannot identify arrow shafts with a specific culture by the markings on it, like the Indian scouts used to do in the old western movies. The same can be said about the arrow shafts, as was said about the bone and lithic domestic tools of in the assemblage: their occurrence cannot preclude the presence of a Fremont group in the cave.

B. SIMPLE PROJECTILE POINT SHAFTS Hardwood (fig. 5-1, type II)

There is one possible example of a simple arrow shaft from the P/W collections; 2-135 is made of hardwood, is 276.2 mm in length; and has a U-shaped beveled cut for the insertion of the projectile point. It is long enough to assume that it was not a component of a composite shaft, but an entire shaft in itself. One end (nock or point end) shows the horizontal arrangement of the remains of sinew bindings secured with resin, just below the cut area. There is no sign of decoration, fletching, or colouring on this simple shaft. Examples of simple shafts have been reported by Jennings (1957:189) at Danger Cave, by Dalley (1970) at Hogup Cave; and at Wilson Butte Cave, Gruhn states that "there are also several long smoothed wooden shafts which may be parts of one-piece arrows"(1961:106).

IV. WOOD DETRITUS

There are nine artifacts in this category. They are all pieces of wood that have been modified in some fashion: spiral rasping, sawing, peeling, whittling, or polishing; but are not recognizable enough to fit into any of the above finished wooden artifact categories. They are likely the by-products or preforms of the finished tools. These wooden fragments have been classified into three categories according to the technique by which they were made: burred sticks (spiral rasping); cut sticks (sawn and snapped); and miscellaneous (the other remaining techniques).

A. BURRED STICKS

There are two specimens in this class: 2-164 and 2-127. They both have spiral cut marks around one end. The spiral rasping technique is done by cutting in a corkscrew pattern around the circumference of the shaft. This is the technique used to manufacture the distal articulations of the hardwood foreshafts. The length between the start of the spiral cutting and the snap is relatively short (1.5 - 3.5 mm), perhaps because this piece was thrown away, while the other piece was kept. This rasping technique could have been useful in segmenting brittle sticks that would splinter if they were simply broken.

The distal, or other end of these burred sticks are frayed, as if someone or something had pounded the end against a hard surface. A possible explanation for this feature might be that these small burred sticks were originally inserted into either end of the hollow cane main shaft. This hardwood "plug" would help support the integrity of the shaft, and prevent splitting or breakage. This function also might explain the burred end, having the same function as the foreshaft end; and the frayed end may be caused by the ramming of the piece into the cane shaft with another stick, or having it slightly exposed (for example, a protector for the nock end).

Gruhn, in her reconstruction of arrow types, mentions the presence of a "hard plug in the interior of the shaft" (1961:105). Dalley (1970:160-161, fig. 115, g & f) suggests these pieces may have been sections of foreshafts that have been broken off flush with the end of the mainshaft, or that they are "feather carders" (1970:172-173). Until more of these burred so called "plugs" are found in association with the shaft-making process, their actual function remains uncertain.

B. CUT STICKS

There are three cut sticks in the P/W collections (3-180, 2-117, 2-122) They have been cut at both ends at a slight angle, creating a V-shaped beveled end. They are surprisingly similar in size, with length ranging from 78.4 mm to 130.3 mm. The sticks have been peeled of bark; but apart from that, their body is relatively unmodified. It has been suggested that these pieces of wood are the preforms for Promontory pegs. Perron has a Promontory peg in his collection, found in the local area. This peg has the same kind of beveled cutting technique and is within the same size range as the sticks. There are no specimens which would fit in between the preform and peg stages; therefore, this comparison is purely hypothetical.

C. MISCELLANEOUS

Four artifacts in this category are sections of wood that have either been cut, peeled, snapped, or polished. Examples 2-165, 3-181 and 2-162 have all been peeled and cut or snapped, while 3-181 has a proximal end that forms a point, and may have been intended as a fire drill. Artifact 3-2 is a large thick segment of hollow hardwood with both ends snapped. There are no cut marks or any indication of human modification: it may be a naturally snapped segment of wood brought into the cave by a packrat, and not an artifact.

B. CANE ARTIFACTS : MISCELLANEOUS

There are only two artifacts in this category; 2-161 is a segment of cane matting and 2-129 is a cane gaming piece. The matting is a flattened length of cane bound with single-ply twine cordage. The cane is too large to have been intended for a shaft, and the length of the cordage suggests that there were other cane pieces bound together. There is a small amount of black resin on the cordage, probably intended to fortify the join between the pieces of the mat. This is the only example of matting known from Wilson Butte Cave.

Artifact 2-129 is a small split rectangular section of cane that has been decorated by burned design of horizontal lines. There are also eight horizontal cut marks distributed relatively evenly along the midline of the cane. There are four burn marks, two at either end (probably causing it to break); and two close to the middle. The ventral face is not modified or decorated in any way. Gruhn found other artifacts similar to this one which she called gaming pieces (1961:110). There are decorated pieces of cane described from Cowboy Cave similar in size and design to this one (Jennings 1980: fig., 36, i-n). Other similar pieces are mentioned by Jennings (1980:80) from Triangle Cave in Harris Wash near Escalante, Utah (D. Fowler 1963:63, fig. 29), and pieces of split cane were also found at Gypsum Cave, Nevada (Harrington 1933:146, fig., 57 a, b). Jennings speculates that these split cane segments are gaming pieces or possibly broken cane tube beads. Artifact 2-129 is most probably a gaming piece or counter, due to the slight polish on the ventral surface.

C. CORDAGE & COMPOSITE ARTIFACTS

CORDAGE:

Cordage is generally made from fibers of sagebrush (Artemisia tridentata) bark, juniper (Juniperus osteosperma) bark, dogbane (Apocynum androsaemifolium), yucca (Yucca sp.), and nettle (Urtica sp.); and used to make nets, traps, ropes, and bowstrings (Stewart 1942).

Cordage is a length of vegetal fibers that have been twisted by rolling them (probably against the maker's thigh) singly, or with other twisted fibers to make a length of strong string or rope. The specimens in the P/W collections have not been braided; but twisted in both the "s" and the "z" twist and joined with another twisted strand to make two-ply cordage. The segments of cordage in the P/W collections have been constructed from shredded sagebrush bark fibers (Artemisia tridentata) .

In a description of cordage, the term "ply" refers to a single yarn which is usually plied with another single yarn to become a 2-ply cord or yarn (Hewitt 1980:61). The direction of twist is determined as follows: if the elements are twisted in one direction so that when held in a vertical position, the slope of the spirals visually conform to the central portion of the letter S, the cord is said to have an s-twist; and z-twist if the spiral conforms in direction of slope to the central portion of the letter "z" (Aikens 1970:121; Hewitt 1980:61).

There are several methods of spinning yarn with a spindle; one of the most common is to roll it along the thigh. Underhill (1944:36) has shown that the twist direction is dependent upon the direction that the spindle is rolled. If it is rolled away from the body, an s-twist cordage results; if the spindle is rolled toward the body, the yarn will be z-twist. This process would mean that in order to make a 2-ply z-twist cord, the first yarn would be rolled away from the body to get the s-twist; then the ply twist would be achieved by rolling the yarns towards the body. Spinning along the leg can also be achieved without the aid of a spindle. Another method using a spindle is to drop the spindle and let it spin freely just above the ground. Here, as before, the type of twist is dependent on the direction the spinner twists the spindle as it is dropped (Hewitt 1980:61, 62).

There are no examples of spindles from Wilson Butte Cave; but the P/W collection contains six specimens of 2-ply cordage, ranging in length from approx. 233.0 mm to 6.5 mm. Three of them are s-twist and three are z-twist. Artifacts 2-201 and 2-216 have simple overhand knots at one end of their lengths; "overhand knots in the ends of cord probably prevented the fibers from unraveling"(Hewitt 1980:66). The only culturally-significant fact that can be pointed out with knots is that the square knot seem to predominate in the Southwest (Basketmaker through Pueblo), whereas the shorthand and ov erhand knots are more common in the Basin (Lambert & Ambler 1961:57).

Using Fowlers' (1990) method of classifying cordage according to angle and degree of twist, I have divided the cordage specimens into (A) s-spun, z-twist, tight and (B) s-spun, s-twist loose.

TYPE A: 2-Ply, s-spun, z-twist, tight.

Number of specimens: 3

The shortest piece of cordage in this category is 129 mm and the longest 52.9 mm. The average thickness is 11 mm, with a spun element averaging 6.5 mm. Artifact 2-201 and 2-216 have overhand knots at one end. The other end of 2-201 seems to have been cut rather than being frayed and worn (the ends are pretty even), while 2-216 has perhaps been more heavily used than 2-201 since the unknotted end is frayed and uneven, with broken, frayed strands the entire length of the cord. Specimen 2-167 is a small fragile segment of unknotted cordage.

TYPE B: Two-Ply, S-Spun, S-Twist loose

Number of specimens: 3

With the exception of 2-168, these pieces of cordage seem to be larger and coarser than type A; although like type A, they all have an s-spun manufacture. The main difference between the two types is that type B has an s rather than a z-twist. None of these s-twist examples have knots along their lengths; they seem to be much looser than type A, and are slightly frayed from use.

The longest piece is approximately 295 mm and the shortest 65 mm, with a spun element width average of 4.3 mm. Artifact 2-215 is the longest, length and seems to have been stored by folding it twice in a concertina fashion (dividing it into three equal folded lengths), while 2-214 has been folded only once. Artifact 2-168 has one end that has been fused by some kind of resin or hardened dirt. The other end is very frayed, almost split into its individual strands.

MISCELLANEOUS

Artifact 2-204 seems to be a length of untwisted sagebrush bark that has been tied in a simple overhand knot, possibly so that it could be stored and used later to manufacture a length of cordage.

CORDAGE/COMPOSITE ARTIFACTS

Four artifacts that are made from sagebrush bark have functioned as something other than for cordage:

A. WICK Artifact 2-203 is a small bundle of vegetal fiber strands held together by a loose bark lashing, and it has been burnt at both ends. This lashing was wrapped three times at one end by a thicker strand of the fiber it is made from (it has since become slightly unraveled). It has been suggested that this artifact was used as some kind of vegetal fiber wick for light, or perhaps to transfer light or fire (Don Tuohy 1991: personal communication). Hewitt describes a similar-looking artifact from Cowboy Cave as a "hairbrush"(1980:68, fig., 30 a). This so-called hairbrush is similar in morphology, having the tied fan-like appearance; but the raw material is grasses rather than sagebrush bark, and there is no evidence of burning. Cowboy Cave also yielded a "bark torch": "compact bundles of juniper bark tightly wrapped with thin stick splinters"; both specimens in Cowboy Cave are charred at one end (Ibid: 71). It therefore seems most plausible that 2-203 is a wick rather than a hair brush, although wicks can be made from a variety of raw materials.

B. ROSETTE There are various examples of fiber rosettes in the archaeological record (Hewitt 1980: fig., 30 c; Aikens 1970:122, fig. 80 a & b; and Gruhn 1961:plate 30 A). Artifact 2-213 is a ring made of sagebrush bark fiber that has been formed by wrapping the bark around a more solid donut frame, or wrapping it on to itsself in a disc shape. It is not known if there is an interior frame for the rosette, since the artifact could not be damaged in order to investigate. The bark strand, has not been twisted; rather, wrapped around its structure or itself to create a compact disc shape. The rosette is relatively small, with a radius of 33 mm (it is slightly oblong with the width radius of 26.1 mm). There is no interior hole, since the bark has been wrapped enough to fill the interior. It seems too small to have functioned as a rest for a globular pot. The coil previously found by Gruhn is larger than the P/W specimen ,and seems more suited to the job of stabilizing a round-based pot.

C. FIRE BUNDLES Artifact 3-89 is made from cane and sagebrush bark. Smaller sticks and twigs have been wrapped at least 11 times around the collection of sticks (one large section of cane, several small twigs). The loose end of this wrapped cordage was tied off by tucking one end into the previous loop. The distal end, or the end which has not been wrapped, seems to have been burnt.

It does not seem likely that this artifact is actually a scraper or knife handle, since handles for those types of tools needs to be sturdier, made from hardwood rather than reed and sticks. The size of the reed and the bulk of the wrapped cordage also discounts this artifact as being some part of an arrow or atlatl shaft system. Therefore I concur with Don Tuohy (1991: personal communication) that this is a fire bundle. It was constructed of materials that would quickly catch and kindle fire; it seems to have been tied like this for convenience. An example of another fire bundle can be seen in Swanson & Sneed 1971:67, fig., 17 g & h.

D. MISCELLANEOUS WRAPPED BUNDLE The function of artifact 2-202 is not understood. It is constructed from a variety of raw materials wrapped in sagebrush bark to form an oblong shape. The interior of the bundle seems to be made up mainly of cut bone sections and perhaps obsidian. The bone is from a medium to large mammal long bone which has been split into rectangular segments (there are no sign of saw marks). There are two long pieces of bone that can be seen from either end of the bundle, and possibly some kind of obsidian tool is included in the bundle that can almost be seen between the sage brush strands, towards the proximal end. The bundle is unusually heavy (4.9 g) to be constructed only from bone and bark, confirming that obsidian tools have also been wrapped into the bundle. Unfortunately we might never know what kind of tool it is, nor if the bones in the bundle might be human. Aikens (1970) describes small bundles from Hogup Cave, which are "small roughly rectangular or cylindrical bundles of very fine plant fibers that have been tightly wrapped by additional fibers"(121). There is no indication that anything other that plant fibers were wrapped. Since this bundle could not have been intended for burning, and does not seem to function as a storage for bark, it probably had a ritual or ceremonial function.

D. LEATHER ARTIFACTS

a. MOCCASIN

Artifact 2-219 is a "Hock" moccasin (see Aikens 1970: fig., 64) for illustration of the construction of a one-piece moccasin). The following description of the "hock" moccasin closely resembles the construction of the P/W moccasin.

> "The hock moccasin is so termed because they were made of hide removed from the hock of an animal by girdling the leg at two points and removing the hide in the form of a skin tube. This tube was sewn shut at one end, the wearer's foot to be inserted in the opening at the opposite end. The tubes were cut from the hock join in such a way that the natural L-shaped angle of the hide at the joint served as the heel of the moccasin. The tie string is a hide thong attached at the front of the ankle above the heel, and brought forward again. The considerable length of tie string suggests that it was wrapped several times around the ankle. None of the hock moccasins appears to have been well tanned although the scant hair remains on the hides suggests that there may have been some treatment" (Aikens 1970:97).

The construction of the P/W moccasin is very similar to the Hogup Cave hock moccasin with a few exceptions. It may be that this moccasin was made from elk or deer hide, due to the red colour of the hair remaining on the moccasin. Moccasin 2-219 has a running stitch across the toe sewn with a one-ply z-twist sinew cord. It also has tie cords attached to the tongue area of the moccasin that were probably used to wrap around and secure the moccasin to the ankle; there are at least five strips of hide cut for ties. There are also 3 or 4 thin strips of hide cut from the outside left side of this right foot moccasin.

Under these strips cut from the left side are three holes, or slits and two on the back close to the heel. These holes were made in order to thread the cut lashings through them in order to tie them off with the side ties, or vice versa.

There are remains of grasses in the inside of the moccasin (species unknown). The size of the moccasin would fit that of a medium to small adult or adolescent (about a modern women's size 7). When the moccasin was found by Perron, it was within the grasses or matting of some kind of bed. The moccasin was flat and unrecognizable, so Perron took it home and put it in his mother's sink to soak until she threatened to throw it out. Perron eased it out into the shape it is now.

Gruhn found a moccasin in Wilson Butte Cave during her 1959/60 excavations. The moccasin was analysed by Richard Conn (1961), and his report was included as an appendix of the report. The moccasin was made from three separate pieces. The body is separate from the patched sole and vamp (the uppers which were probably wrapped around the ankle). Included in Conn's comparative notes is an interesting comment concerning the possible origin of the moccasin style.

> "The hard rawhide sole adds several difficulties to any attempt to place this moccasin in its proper historical relation. Was the sole part of the original moccasin or was it added as a later reinforcement? Pursuing the former possibility, the moccasin would appear as an intermediate stage in the development of the true separate-soled hard sole moccasin. In this respect, it might prove advisable to compare it to the hard-soled moccasins recovered from sites of the Fremont culture" (Conn 1961:198).

DEW CLAW MOCCASIN

At Hogup Cave three hock moccasins were found in association with 16 Fremont moccasins. Although the hock moccasin did not have a Fremont (Dew claw) moccasin in association at Wilson Butte Cave, there was one found from the surrounding area. A Dew Claw moccasin or Fremont moccasin was found at

Eureka Cave (10EL 141/11) near Mountain Home in southern Idaho, slightly west of Wilson Butte Cave. It is stored in the Bureau of Land Management Assay Office in Boise (6US ROOS Collection). The description given by Morss (1931: 64-65) and in Aikens (1970:102) gives the general description for the manufacture and form of the Fremont moccasin (see also the illustration in Aikens 1970:103, fig. 63).

> "In the Fremont moccasin, the upper is divided fore and aft into two main pieces joined at the heel and along a seam running diagonally from the front of the leg outward toward and over the third or fourth toe. The inside piece extends over the front of the toes and comes under, forming a part of the sole for a third or more of its length.
>
> It is normally equipped with a projecting triangular tongue over the instep, which comes around the outside of the ankle. The smaller outer side of the upper forms no part of the sole. The sole is, in the new moccasin, a longitudinal strip extending from the end of the bent-over portion of the inner half of the upper to the heel...
>
> A remarkable feature of most moccasins is the use of strips from the foot of the sheep in the sole in such a way that the dew claws project and serve as hobnails. Tie strings are somewhat variable, but in general were attached at the side of the foot, brought around the heel, and tied at the ankle"(Aikens 1970:102).

From the photograph in the appendix, it can be seen that the Eureka Cave moccasin is definitely a dew claw moccasin and definitely Fremont. This being so, and assuming that moccasins are not a trade item, since they are domestic artifacts and usually made to fit a specific individual's foot, this Fremont moccasin provides convincing evidence for a physical Fremont presence in southern Idaho during the Dietrich phase (although a date cannot be positively assigned).

The Assay Office also had other Fremont artifacts such as cord and bundle basketry (10CNX.12) from the Manning Site burial, as well as corn cobs from the same site. There were Gray Ware pottery and unfired clay figurines from Lydle

Gulch (10AA72). These artifacts as well as the Fremont moccasin really illustrate the fact that there are numerous "anomalous artifacts" not within the expected range of Shoshone material culture; so either we have to expand our expectations of Shoshone material culture, of accept the fact the Fremont are very much a part of the cultural tradition of southern Idaho.

The association of hock moccasin with a hobnail moccasin in the same stratigraphic layer of Hogup Cave, probably represents two kinds of footwear worn by the same people. The hobnail moccasins could have had a specific function, since they would not appear to have been very comfortable for work on a daily basis. Perhaps these hobnail moccasins were designed for a specific terrain; and the hock moccasins for day-to-day life. The Shoshone never wore moccasins like these hock moccasins, but sewed together a flat piece with many seams. This way of making moccasins continued into ethnographic times (Lowie 1909:180) (fig. 5.2).

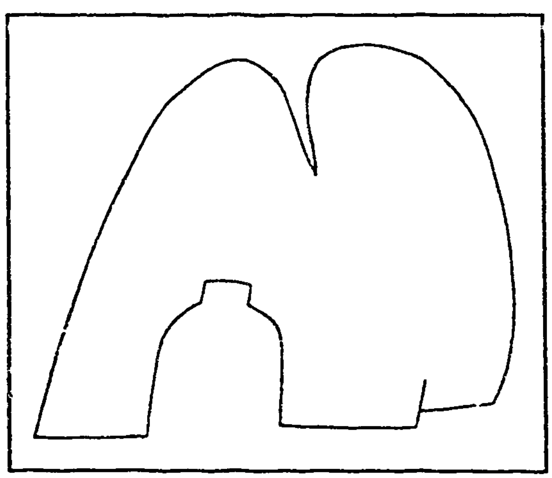

Fig. 5-2. The pattern of a Shoshone moccasin (adapted from Lowie 1909:180)

b. LEATHER POUCH/MOCCASIN

Artifact 2-206 is a sewn fragment of either a pouch, or a moccasin. The leather piece is semi-circular in shape with the sewn edge convex. There are at least eight stitches sewn in an overhand style. The area that has been sewn does not run the length of the edge, but has a beginning and an end. The leather has been cured, but there is a small patch of red hair (possibly elk) on the dorsal lower side. A small amount of grass was found in the interior of the sewn fragment, like the hock moccasin described above. It seems likely, due to the similarities between the moccasin and this sewn fragment, that 2-206 is a piece of moccasin, the grasses acting as padding, and the sewn section the toe of the moccasin.

BASKETRY

During the 1989 excavations of Wilson Butte Cave a small section of rim basketry was discovered in the disturbed uppermost deposits of the cave. It is the only evidence of basketry that has been reported from the site. It was sent to adovasio in 1990 for identification. It was identified as one rod and bundle basketry, Fremont in origin (Ruth Gruhn, personal communication). The results of adovasio's identification will be published in Gruhn's report on the 1988/1989 excavations.

CONCLUSION

Taken as a whole, the perishable artifacts from the P/W collections, especially the Fremont basketry and moccasins, make a substantial contribution to the mounting evidence of a Fremont occupation of southern Idaho.

There is very little evidence for arrow shafts or atlatl shafts in the archaeological record, due to the lack of preservation of these materials in most open air sites in southern Idaho, which makes comparisons of Fremont shafts and Shoshone shafts difficult if not impossible. Therefore there is not much that can be said about the cultural significance of the shafts in the W/P collection; just that both the Fremont and the Shoshone shared the technology of bows and arrows, and probably atlatls as well. Not enough decorated shafts have been found to construct a culturally diagnostic stylistic attribute list for the shafts. This shared technology between groups and geographic regions tends to produce artifact similarities that confuse rather than aid the process of material culture definition.

It seems that cordage technology is ubiquitous to the Great Basin and Idaho region, one and two-ply cordage occurring in most prehistoric sites in the arid west. Two ply "s" and "z" twist cordage has been found in Fremont sites all over Utah (Aikens and Madsen 1986:156) and in ethnographic times by the Shoshone (Murphy and Murphy 1986:303). Whether or not a cord has an "s" twist or "z" does not seem to have any cultural significance, since it just as easy to rub the fibers one way along your thigh as it is the other. The cordage of Wilson Butte Cave could have been produced by either the Fremont or the Shoshone, or both.

The presence of an item like the dew claw moccasin in Southern Idaho, as well as the two Wilson Butte Cave moccasins that are probably Fremont in origin, constitutes tough evidence to dispute. As already mentioned, moccasins would not have been trade items, especially when they have no decoration or esthetic value; and they would have been made specifically for the person who was to wear it. The person who wore the dew claw moccasin from Eureka Cave must have been Fremont; and so was the person who wore the hock moccasin in Wilson Butte Cave.

CHAPTER 6: POTTERY

Introduction:

One dozen pottery sherds were recovered in the 1959/60 excavations in Wilson Butte Cave. These were found in situ, and were assigned to the Dietrich phase (dating after A.D. 1300) (Gruhn 1961:132). To Gruhn, the pottery seemed to be of only one type, which she called "Wilson Butte Ware" (1961:98). She mentions that "in the course of his digging on the north side of the cave Wayne Perron accumulated a shoe box full of sherds which was stolen when left in the cave" (Ibid.). Thirty years later, I failed to locate the whereabouts of that shoe box; however, I did discover that Smoky Webb and Wayne Perron had failed to put 71 pottery sherds in that shoe box, 14 of which are rim sherds.

Analyzing thickness, body shape, surface treatment, matrix size, lip form, and rim form, and comparing the sherds to known Fremont and Shoshone pottery wares, I have identified two types of pottery in the P/W collections: Shoshone Ware and Great Salt Lake Gray Ware. The former represents a Shoshone occupation, and the latter a Fremont occupation in Wilson Butte Cave.

Gruhn's reconstruction of the prehistory of southern Idaho is based on the Wilson Butte Cave collection, with a heavy emphasis on pottery. The Dietrich Phase is attributed to the Shoshonean-speaking immigrants from the Great Basin (Gruhn 1961), in "keeping with the view that the Shoshonean-speaking peoples began spreading from the southeastern corner of the Great Basin about A.D. 1000 and had arrived in the northeastern corner of the Great Basin by A.D. 1200-1300" (Butler 1981:1). However, Gruhn's Dietrich phase was heavily dependent on her classification of 12 pottery sherds as Shoshone.

Jack Rudy, an authority on the pottery of western Utah, identified the Wilson Butte Cave sherds as "undoubtedly Shoshone ware" (Gruhn 1961:99-100); and led Gruhn to state that:

> "An identification of the people of the Dietrich phase at Wilson Butte Cave as Shoshonean is fairly certain. The primary evidence is the associated pottery: Wilson Butte Plain ware is clearly related to pottery definitely identified as Shoshonean in Western Utah and further southeast in the Great Basin..." (1961:143).

Gruhn's assumptions of a Shoshone occupation were challenged in 1969 when Adovasio conducted an extensive analysis on basketry fragments for several southern Idaho caves and identified them as Fremont, not Shoshone (Butler 1981). (Adovasio likewise classified the 1990 basketry fragment from Wilson Butte Cave as Fremont).

Butler (1979) conducted a detailed study of pottery from the Upper Snake and Salmon River country, and noticed that he had Desert Gray wares as well as Shoshone wares. These Desert Gray wares are characteristic of the Great Salt Lake variant of Fremont in Utah. This led Butler (1979) to believe that the Fremont had extended northward into southern Idaho and survived there well into the late period, and that they were either evolving into or coexisting with Shoshonean-speaking peoples during the late period. He suggested further that if the Fremont people had evolved into the historic northern Shoshone of this region, the basketry and pottery of the latter should reflect Fremont characteristics (Butler 1981:2).

This theory was put to the test by James Adovasio and Catherine Fowler in 1980 (the former an expert on Fremont, the latter an expert in Paiute-Shoshone basketry). The study was done at the Idaho Museum of Natural History, and they concluded that "there was absolutely no evidence of continuity in basketry-making techniques between the archaeological specimens from southern Idaho caves and ethnographic specimens held in the museum's basketry collections. Furthermore, all of the archaeological specimens were definitely of Fremont type

(Butler 1981:2). This led Butler to have the Wilson Butte ware reexamined by Dr. Jesse Jennings (U. of Utah) in the same year. Rex Madsen, David Madsen, and Frank Hull also looked at the sherds.

> "Rex Madsen examined under a microscope nine of the sherds that Dr. [sic] Butler sent down for identification from Wilson Butte Cave. Without question, Rex identified the sherds as Great Salt Lake Gray. Temper is rounded sand with quite a lot of mica. Some of the sherds have the characteristic light orange-brown colour. The exterior of some of the sherds has striations but generally the vessels were smoothed and scraped, typical of Great Salt Lake Gray . The incised rim decoration is also typical. Sherds 10382, 10053 and 10003 are "type quality" Great Salt Lake gray" (Jennings 1980; personal communication, in Butler 1981:3).

Exactly what is the physical difference between Fremont and Shoshone pottery? This definition of Great Salt lake Gray ware was formulated by Madsen (1979) and Rudy (1953) (Butler 1983a:12).

<u>GREAT SALT LAKE GRAY:</u>
Construction: Coiled
Core colour: Predominantly dark gray with occasional buffs and reddish browns. Occasionally light gray.
Temper: Predominantly volcanic glass and small amounts of quartz. Ranges from fine to medium (0.1 to 3.0 mm). The paste is coarsely micaceous. Under a hand lens the temper appears as medium-sized quartz.
Texture of core: Generally medium, ranging to medium coarse, occasionally fine. The sandy texture, due to large quantities of temper, results in a friable fracture. The temper makes up between 30 and 40% of the wall.
Surface finish: Smoothed to slightly polished. Mica conspicuous on both surfaces. The exterior surface is usually smoother than the interior surfaces. The exterior surface is slightly pitted but is not identical with Lino Gray. Striations are generally found on the interiors.
Surface colour: Predominantly dark gray, ranging from light gray through dark gray to almost black. some buffs.
Wall thickness: Average 4.9 mm; range from 3 to 6.5 mm.
Rims: Out-curved.
Decorative techniques: Punching and appliqué (incising and fingernail impression). (Butler 1983b:13)

Butler (1983b) differentiates between Promontory Gray and Great Salt Lake Gray ware. He considers the Promontory Gray ware to represent an intrusive pottery-making tradition of possible Plains Woodland origin. It is also the most recent of the pottery wares characteristic of the Great Salt Lake Fremont area, probably dating no earlier than A.D. 100 (R. Madsen 1977). As I consider the so-called Promontory people of north Utah to be a late manifestation of Great Salt Lake Fremont Variant, the Promontory Gray ware will be considered as a variation of Great Salt Lake Gray ware. The definition has been formulated by Rudy (1953), D. Madsen (1979), and R. Madsen (1977):

PROMONTORY GRAY

Construction: Coiled.

Core colour: Predominantly black, occasionally brownish black to dark buff or tan (rare).

Temper: Coarse, angular calcite and medium quartz sand, occasionally minute flakes of mica.

Texture of core: Usually coarse, but ranging from medium to coarse; rarely fine.

Surface finish: Poorly smoothed or scraped; striations apparent on both surfaces; occasionally lightly polished, polishing marks visible. Surface is undulating.

Surface colour: Black, rarely dark buff or dark gray.

Shapes: jars; possibly bowls.

Rims: Straight, out-curved, occasionally in-curved. Lips rounded or flat and generally thickened. Average 10 mm in thickness and range from 9 to 12 mm. Decorated.

Wall thickness: Variable. Averaging 4.5 mm; range from 3 to 9 mm.

Decorative techniques: Incising (appliqué), fingernail impressions, punching (Butler 1983b:14).

Shoshonean pottery is most easily recognized by its shape. It is usually flat-bottomed, flanged-based, flowerpot-shaped. It has also been referred to as "Intermountain Tradition" pottery by Tuohy (1956) and Coale (1963). This pottery is prevalent throughout southern Idaho; south of the east-west course of the Salmon River across central Idaho and dates from ca. A.D. 1450 into the early historic period, A.D. 1820-1840 (Butler 1983b:14).

Coale's (1963) description of Shoshonean pottery is applicable for all Basin Shoshonean pottery, whether flat-bottomed, conical, or globular.

SHOSHONEAN WARE

Form: Truncated cones, flat-bottomed with straight walls , flared out of the vertical plane at angles of form approx. 5 - 25°. Variations: The shoulder formed by the juncture of the bottom and wall may constitute a simple angle, or may have an annular flange development. The wall may be slightly inverted at the mouth so that the greatest diameter of the vessel may fall at a distance approximately one-third of the vessel height below the rim.

Temper: Consists of grit, sand, or crushed rock. In the case of grit and sand, the paste may not always have been intentionally tempered since aplastics occur naturally in sedimentary clays. Quartz fragments may also be natively present in imperfectly decomposed residual clays. The temper is ordinarily quite coarse compared with Puebloan (Anasazi) wares, but still there is a great deal of variability of temper-particle diameter within Shoshonean pottery as a unit.

Surface treatment: Roughly scraped, to well smoothed and "floated" (manipulation of the paste surface with a moist implement), generally on the exterior surface. The finish is always plain, without the addition of a slip or wash.

Decoration: Pots seldom decorated, ornamentation usually being limited to incised or indented geometric designs in a narrow zone around the rim, either inside or out.

Firing technology: At low temperatures. The general gray or grayish cast suggests that a reducing atmosphere was the rule. Brown and buff splotches which are frequently present indicate oxidation at higher firing temperatures in cooking use. Examination of sherd sections shows that the zone of oxidation present in these cases seldom penetrates the thickness of the wall.

Construction: Coiling and modeling were used, followed by paddle-and-anvil treatment. An irregular, undulating surface is common in this pottery (Butler 1983b:16). This is due to the molding and patching technique (employed by ethnographic Lemhi Shoshone and other horse-mounted, former Plains-dwelling Shoshoneans in eastern Idaho and northern Utah (Steward 1943).

From this evidence Butler (1983b:16) stated that "Shoshonean pottery is extremely varied in construction and finishing techniques, perhaps even more so than Great Salt Lake Gray, with which it is sometimes confused even by experts when handed an isolated wall sherd or two to identify."

B. CLASSIFICATION: The pottery Sherds from the Perron/Webb Collections

There are a total of 77 pottery sherds in the P/W collections, 19 of which are rim sherds. I have classified these sherds according to their colour, thickness, rim shape, and lack or presence of decoration. As stated previously, there are two types of pottery represented in the pottery assemblage, Great Salt Lake Gray (with a Promontory influence) and Shoshone ware. I have described these two types of pottery according to the criteria set out by Gruhn in her 1961 pottery analysis. Unfortunately, due to limited access to the sherds for microscopic analysis; I was not able to identify the mineral composition of the matrix; or to determine the firing technique by which the vessel was made.

A. SHOSHONE WARE

Size of Sample: Rim sherds - 9
body sherds - 31 Total of 40
Colour: Surface colour ranges from light brown (29 out of 40) to dark brown/black.
Luster: Dull.
Surface texture: Smooth to slightly rough.
Surface finish: 11 sherds have been wiped leaving light striations, three others have deeper striations probably caused by brushing with grasses or small twigs.
Thickness: Range: 6.5 - 11.2 mm, with an average of 7.9 mm (the average thickness of a rim sherd is 7.8).
Temper: Moderate amount of fine to medium-sized clasts of angular rock (mostly quartz) and sand. The texture is fine to medium (0.1 - 0.2 cm to 0.4 - 0.5 cm).
Shapes: The rim is straight, the lip rounded. Vessel form probably straight sided to slightly convex flowerpot shaped (25 sherds convex, 15 straight).

Gruhn (1961:98) described a sherd (#10053) with thickening on one side that may be from near the junction of the wall and the flat bottom of the vessel.

Decoration: No decoration whatsoever.

Evidence of pottery-making techniques: The slightly undulating surfaces of some of the larger sherds implies these vessels were coiled. Their surfaces have been treated by wiping and brushing. There is no indication of striations on the interior surfaces of the vessels.

Function: The carbon residues on the interior of the sherds indicates that they were used for cooking. Butler (1987) has hypothesized that these kinds of pots were used as all-day stew pots that were left in the fire all day. The thermal fractures created by continued heating and cooling day and night were fixed by drilling holes on either side of the crack then lacing the sides together with sinew or rawhide to prevent the crack, from traveling further down the pot . There are four sherds in the P/W collection that have been drilled. The size of the hole ranges from 3.1 to 5.3 mm in diameter, with an average of 4.4 mm.

Comparisons: Butler 1983b:18, fig. 9 "Flat-bottomed Shoshonean ware from the Snake River Plain".; Coale 1963: 1 " Vessels with truncated cones, flat-bottomed with straight walls which are flared out of the vertical plane at an angle of approximately 5 to 25 degrees.; Plew and Bennick 1988: 115-6, fig., 6 & 7.

B. GREAT SALT LAKE GRAY WARE

Size of sample: Rim sherds - 10
Body sherds - 27 total - 37

Colour: Surface colour varies from light gray to reddish/brown to black (usually light gray).

Lustre: Dull to slightly buffed.

Surface texture: Very smooth.

Surface finish: 15 sherds have been wiped (slight striations), three have been brushed with grasses or twigs (deep striations).

Thickness: Range between 3.7 - 9,1 mm with an average thickness of 6.1 mm.

Temper: Occasional sherd with high mica content. Matrix is very fine with small amounts of angular quartz, mica, and sand. The texture is fine (0.1 - 0.2 mm).

Shapes: Six rounded T-shaped rims, two are bulbous but do not protrude over the exterior rim. Lips are rounded. A globular vessel form is indicated by the rounded convex basal sherd, and the fact that all the sherds have a convex outline.

Decoration: One body sherd has a thunderbolt design painted in black paint (gray background). All but two of the rim sherds are decorated.
Finger punctates: five sherds have one or two rows of vertically arranged rows of fingernail punctates running in a band 1 - 2.5 cm below the rim (the bands are not always continuous). On one example, (3-1005) there are

two bands of striations drawn under the row of punctates as another design element.

Rim designs: One sherd (2-207) has the exact same herringbone rim design as described by Gruhn on a rim sherd for Wilson Butte Cave (p. 99 and plate 23) (for a better picture of the sherd see Butler 1983b: 11, fig. 5). It is presumed that these two sherds came from the same vessel; no comparative examples have been found. Sherds 2-211, 2-208, and 2-210 have a "pie crust" rim pattern, where the maker has pinched the rim with his/her finger tip or his/her nails to create the effect.

Evidence of Potter-Making techniques: The undulating surface of coiled technology is evident on some of the larger sherds.

Function: Sherds 2-208 and 2-209 have remains of an uncarbonized yellow organic material adhering to their interior surfaces (some unknown food material). 18 sherds had large amounts of carbonized material on their interior surface. These vessels were used for cooking, and perhaps storing foodstuffs.

Comparisons: Butler 1983b: 11, fig. 5 & 6, Great Salt Lake Gray Ware (The punctate pattern in the P/W collections are similar to the sherd from the Wasden site).

C. Other Ceramic Objects:

Clay objects do not occur in the P/W collections, but have been described from previous Wilson Butte Cave collections. Four small cigar-shaped clay objects, all presumably from the Dietrich phase of Wilson Butte Cave (two were found in a disturbed area), were discovered by Gruhn in her early excavations (1961:100). The objects had been shaped by rolling them into a wad in the palm of the hands; one end generally had more of a point than the other. One specimen (#11593) has two pairs of grooves on the thickest part, each groove roughly impressed diagonally in from the side to form a crude double chevron pattern. Figures like these have been found at Danger Cave (Jennings 1957: 207 - 208) and at Death Valley III - IV sites (Hunt 1960: fig., 59, f, g).

Figurines are one of the items included on Wormington's (1955) trait list defining a Fremont material culture. Clay figurines are not reported in ethnographic accounts of Shoshone material culture. Four clay figurines were found at Columbet Creek rockshelter in the Owyhee uplands in 1961, three of which were "human;" and have " a general stylistic similarity with Fremont figures" (Lynch and Olsen 1964:9).

CONCLUSION:

When comparing the descriptive information for the Shoshone Ware sherds with Butler's definition of Shoshone Ware, one finds that they correspond in all criteria. Although there is a wide range of variation for the physical properties of this kind of pottery, flat-based sherds, straight-sided walls, lack of decoration, and drill holes qualify these sherds as members of Shoshone, rather than Great Salt Lake or Wilson Butte Ware.

When comparing the sherds classified as Great Salt Lake Gray (G.S.L.G.) to the definition, there are two incongruities. The wall thickness in the P/W examples are thicker than normal, perhaps due to the presence of what Butler calls the Promontory ware. This type of pottery is slightly thicker and coarser, although still assigned to a Fremont origin. It may be that the G.S.L.G. ware assemblage also has a few examples of Promontory pottery, which has the same colour, shape, and construction. The other criterion for G.S.L.G. that does not seem to be obvious in the P/W collections is interior surface finishing. The P/W collections have only two examples of this feature, and I can find no explanation for this scarcity. Generally the P/W sherds do fit the criteria for being G.S.L.G. ware, a fact that Butler has been trying to demonstrate for quite a few years now. The fine texture, rounded globular shape, and presence of decoration is very unusual in southern Idaho for the Shoshone pottery makers. I agree with Butler that the presence of this different kind of pottery can only be attributed to a Fremont occupation of southern Idaho.

CHAPTER 7: CONCLUSION

From the evidence provided, can it can be demonstrated that there are artifacts in the Wilson Butte Cave collections that are Fremont in origin? If there are such artifacts, how can we be sure that they are the result of an actual occupation by Fremont peoples, rather than evidence of contact between two cultural areas?

How does the P/W collections compare to the Fremont and Shoshone trait lists outlined in the first chapter ?:

Traits taken from the Great Salt Lake definition of Fremont:
1. Lacks substantial dwellings, stone masonry architecture is missing *
2. Economy is based mostly on hunting and gathering *
3. Rosegate projectile points *
4. Slate knives
5. Etched stone tablets
6. Knives or saws of scapulae
7. Bone whistles
8. Harpoon heads
9. Great Salt Lake and Promontory Pottery *
10. Ground stone pestles

Traits taken from the definition of the Northern Periphery (Fremont):
1. Dew claw and hock moccasins *
2. Hide shields (from pictograph representation from the Jarbidge Rock Art Site in Southern Idaho (Murphey N.D.: 9) #
3. Pecked round stone balls * (round stone pebbles)
4. Small rectangular gaming pieces *
5. Anthropomorphic petroglyphs, pictographs # (Jarbidge Rock Art Site)
6. Unbaked clay figurines *

Traits taken from the general definition of the Fremont:
1. Split-rod and bundle basketry foundation *
2. Reed matting *
3. Bifacial, leaf-shaped, oval and asymmetrical knives *
4. Expanding base drills the most common type *
5. Many awls, all types; the splinter type predominates. *

* = found in the Wilson Butte Cave collections
\# = found in southern Idaho

Of all the combined classic Fremont traits, 13 out of 21 are present in the Wilson Butte Cave collections. If one were to subtract items for vegetal food processing and fishing, since this site was used predominantly as a hunting camp, 13 out of 19 traits are present. A site does not need to have every one of the traits present in order to be defined as Fremont, as this culture has a wide range of material culture variation, differing between geographic regions. The trait lists provide examples of the kinds of artifact types that could be found at a Fremont site. It may be seen that Fremont type artifacts are present in sufficient quantities to represent a Fremont occupation of Wilson Butte Cave.

<u>Some of the traits outlined in the first chapter as being specifically Shoshone are:</u>

1. Wooden or horn handles @
2. Desert Side-notched projectile points @
3. Circular or oval scrapers @
4. Salmon gigs
5. Sharpened rib scrapers
6. Shoshone ware pottery @
7. Sagebrush bark baskets, bags, or blankets
8. Reed mats @
9. Moccasin - single cut piece
10. Cylindrical and elk tooth beads @
11. Sinew-lined composite bow
12. Unnotched arrow shafts
13. Rabbit fur blankets
14. 3 inch long bone or wood gaming sticks.

@ = present in the Wilson Butte Cave collections

Of the traits defined as specifically Shoshone, six out of 14 are present in the Wilson Butte Cave collections. The proportion of Shoshone traits in the collections is lower than the proportion of Fremont traits (this is interesting to note since the a Shoshone occupation in the cave has never been questioned).

The trait lists do not function as check lists, but guidelines of the predicted kinds of artifact types representing a particular cultural group . It is also not the presence of these types in itself, but the concentrations of these types that is significant. The Wilson Butte Cave collections contain not just the occasional bone gaming piece or a couple of Rosegate points; but 71% of the projectile points of the Dietrich phase are Fremont types; 68% of the entire P/W bone assemblage (including awls and beads) are Fremont type gaming pieces; 18% of the scrapers are probably Fremont; 55% of the pottery is Promontory or Great Salt Lake Gray Ware, and 100% of the perishable artifacts that can be assigned cultural affiliation are Fremont in origin. The concentrations of Fremont type artifacts in the Wilson Butte Cave collections makes a Fremont occupation difficult to deny.

Thus sufficient evidence has been presented to demonstrate a Fremont occupation of Wilson Butte Cave. One explanation proposes that a related to group of Great Salt Lake Variant Fremont migrated on to the Snake River Plain anywhere between 400 - 1350 A.D., and occupied Wilson Butte Cave between 1300 A.D. until just prior to contact. It has been demonstrated that the Shoshone were also occupants of Wilson Butte Cave at one time. According to one scenario, they migrated into the area during the last millennium, and remain until the present time. The Idaho Fremont as a people probably relinquished their distinctive material culture as they became more and more adapted to a mobile hunting and gathering settlement pattern, and thus became less and less visible in the archaeological record.

Another explanation for the Fremont traits to be present in southern Idaho could be that as the technological influences emanated out of the southern end of the Great Basin from the Anasazi people around 400 A.D. these influences reached farther than Utah, into southern Idaho. This interpretation would mean that, as in Utah, the Archaic people living in the Idaho area developed a Fremont lifestyle <u>in situ</u>. More research needs to be undertaken to determine the antiquity of these Fremont traits in Idaho. If these cultural traits in Idaho can be traced to the same time or slightly later as they were developing in Utah, there is a very strong possiblity that we should consider a sixth Fremont variant, evolving in situ in Southern Idaho.

Some of the question asked in the introduction were:

1. Is our definition of the Fremont and Shoshone material cultures correct ?: A large number of Fremont and Shoshone site assemblages were used to define the range of formal variation of both material cultures, depending not on one but on many sources to ensure reliability.

2. Can these Fremont artifacts be present in Wilson Butte Cave as a result of trade between the two cultures ? Trade items generally tend to be exotic; i.e.., shells, copper, obsidian; or resources available only in particular areas, i.e., buffalo robes, pine nuts, or salmon oil. Fremont items like projectile points or moccasins are domestic in function rather than exotic. There seems to be evidence of a production sequence for items like gaming pieces and projectile points, demonstrating that they were made in the cave rather than transported there in their finished form. Barnett also points out that:

> "The members of two contacting societies consistently fail to make or accept cross-cultural substitutions of traits and behaviours when these, as is most often the case, are overtly unlike, no matter how certainly they may be shown to perform equivalent functions in the two cultures" (1975:3).

It seems that although contact between the two groups would have been possible in Idaho between 1300 A.D. to present, contact between the Utah Fremont and the Shoshone would have only been possible from approx. 1000 - 1350 A.D., as the Utah Fremont culture disappeared after 1350 A.D. This does not give the Shoshone much time to establish relations with the Utah Fremont. There is no evidence of finished exotic goods or resources being exchanged by the Shoshone from Wilson Butte Cave with a Utah Fremont group. There is more evidence of a domestic occupation of a hunting and gathering group related to Great Salt Lake Variant Fremont.

3. Are the Fremont items a result of scavenging ?: If artifacts were scavenged from a Fremont site by a Shoshone group traveling through Utah, they would have been collected in small numbers (due to opportunistic finds). Fremont projectile points and gaming pieces occur in large numbers in the Wilson Butte Cave, and at different production stages.

4. Are the Fremont the ancestors of the Shoshone? Linguistic studies of the Numic expansion into the Great Basin have suggested that the Shoshone originated in the southwest corner of the Great Basin some time before 1000 A.D. (Miller 1966; Miller, et al. 1971; C. S. Fowler 1972, and Lamb 1958). "It would have been necessary to have a Numic expansion about A.D. 400-500 in order for the Fremont to be ancestral to the Shoshone " (Marwitt 1986:171). This theory, is however, controversial

5. Did Fremont lifeways develop out of an Archaic population in Idaho at the same time the Fremont was developing in Utah? In order to examine this hypothesis, dating of Fremont traits found in southern Idaho sites [illegible] to be undertaken. If the Fremont in Idaho date back to A.D. 400 or slightly later, then an in situ development is very possible. If the Fremont traits do not appear in the archaeological record until a few hundred years later, then a late migration of Great Salt Lake Fremont likely occurred. The evidence that I have from the Wilson Butte Cave collections dates the Fremont presence to sometime around 1300 A.D., but perhaps earlier Fremont traits have previously gone unnoticed.

The linguistic reconstruction of the spread of Numic speakers throughout the Great Basin after 1000 A.D. from the southeast corner of the Great Basin is not an interpretation accepted by all researchers. In fact, Goss (1977), who was one of the initial supporters of this theory, now believes that the Numic homeland is not near southern California, as he once thought. He points out that Death Valley, an ecologically severe and sparsely populated region, is an unlikely starting point for a massive migration of people throughout the Great Basin.

Aikens and Witherspoon (1986) also disagree with the accepted migration model, and suggest that the Numic speakers have been in the central region of the Great Basin for at least 5000 years. The Fremont and Lovelock cultures (in the Humboldt and Carson Sink areas in far-western Nevada) are considered to be intrusive due to their distinct technology and material culture; and when they died out due to environmental pressures around 1300 A.D., the Numic speakers moved in to take their geographical places.

Gruhn (1987) proposed, like Aikens and Witherspoon, that the Numic speakers have been in the Great Basin for longer than 1000 years. She believes that the Archaic/or Desert Archaic peoples are the direct ancestors of the ethnographic Numic speakers. The Fremont and Lovelock cultures were later intrusions on the peripheries of the Great Basin.

This reconstruction of the spread of the Numic speakers and eventually the Shoshone into Idaho would seem to support the theory that the Fremont were an in situ development of an Archaic population due to outside influences, as it was is Utah. The Shoshone, therefore, were the intrusive population, replacing the Idaho Fremont after the Utah Fremont had been extinguished in Utah, after 1300 A.D. There would have been no immigration of a Great Salt Lake Fremont group; rather a diffusion of ideas from this area into southern Idaho.

However, a later population spread into southern Idaho is not so unreasonable a move as some would suggest. The distance between the Great Salt Lake Fremont home range and the Snake River is a mere 100 - 150 miles, with no topographical obstacle from the northern tip of the Great Salt Lake all the way to the Snake River. "The Snake River is an ecological rich environment; its waters provided fish, its plains yielded roots, its upper reaches gave pasture lands for buffalo. The country was peripheral to the Basin, the plateau and the plains, and enjoyed many of the ecological benefits of each" (Murphy 1960: 286). Migration of a people adapted to a lake and marsh environment to an ecologically rich river region, an easy 100 miles away, is not such an outrageous suggestion.

Future Research:

Before research into the Fremont in Idaho can take place, researchers must readjust their concept of what the Fremont people were. They did not have to have sophisticated architecture in semi-permanent villages; the way they lived depended very much on the resources available to them. I asked an archaeologist in southern Idaho what it would take to convince him that the Fremont once lived in the area; he told me they would have to walk out of the desert and shake his hand. Archaeology has to be more receptive to new information, even if that means changing an old school of thought.

A reevaluation of existing so-called Shoshone assemblages from the Snake River Plain needs to be undertaken in order to determine what portion of these assemblages is actually Fremont rather than Shoshone in origin. When research is done with the intention of looking for something, rather than being sure it cannot be there, a different picture indeed is created.

A closer look needs to be taken at the stratigraphic postion of Shoshone and Fremont type artifacts at a site to determine if both cultures were once contemporaneous, or who arrived in the area first. This information would not only help reconstruct the temporal boundaries of the Fremont in Idaho; but also provide a better understanding of their subsistence and settlement patterns in Idaho.

A comparison between Archaic and Fremont assemblages from southern Idaho may illuminate some kind of technical continuity between the two groups that would help demonstrate an in situ Fremont cultural development, rather that an incursion. For example, the P/W projectile point assemblage suggests a technological similarity between Archaic Elko points and Rosegate points; the only difference between the two is that the Elko points are bigger. The notch position and general morphology are almost identical. This size reduction over time from Elko into Rosegate points may have resulted from a gradual technological adaptation to the bow and arrow. Therefore, the Elko and Rosegate point may be two phases of the same projectile point tradition, suggesting one element of continuity between the Archaic and the Fremont peoples.

What kind of information has the analysis of the Perron/Webb collection provided in the reconstruction of the Dietrich phase of southern Idaho? We already know that bison hunting was one of the main occupations of the people of Wilson Butte Cave (Gruhn 1961), and probably that occupation occurred sometime when the snow was on the ground, since water is not readily accessible near the cave. The P/W collections tell us that there was projectile point and biface production going on in the cave, as well as the production of gaming pieces. These bone gaming pieces, as well as the river pebbles, indicate that idle hours were spent gambling or game playing, perhaps waiting for a bison herd, or during the time of plenty after meat had been procured. Food was being cooked in the globular pots.

The Shoshone were also occupants of Wilson Butte Cave during the Dietrich phase; whether before or after the Fremont is unknown. The amount of artifacts suggests that the Fremont reoccupied the cave over a length of time, with the Shoshone coming later and spending less time. Since B. Robert Butler first proposed the hypothesis that the Fremont ventured as far north as the Snake River Plain, there has been a considerable amount of skepticism. It is my hope that sufficient evidence from the Perron/Webb collections as well as Gruhn's Wilson Butte Cave collections has been presented to satisfy this skepticism, and demonstrate solid evidence of the Fremont in Idaho. It is my personal belief that the Fremont were an in situ development out of an Archaic population, with a transferral of ideas from the Great Salt Lake Fremont region, rather than an actual population.

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APPENDIX A:

Individual Artifact Measurements

METRIC INFORMATION OF THE PERRON/WEBB COLLECTION

Chaper 2: Projectile Points

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (mm)
2-177	Obs	0.7	19.5	2.3	11.6
3-121	Obs	1.2	20.4	3.7	13.2
3-134	Obs	1.3	25.7	3.5	14.6
3-135	Obs	0.7	20.2	3.4	11.7
3-100	Obs	1.1	22.6	3.7	13.9
3-92	Obs	1.3	22.9	3.8	16.6
3-137	Igm	0.9	19.3	3.1	15.7
2-158	Obs	0.5	14.2	2.3	13.9
Cottonwood Leaf-shaped					
2-139	Igm	1.4	22.1	3.2	13.8
2-224	Chert	1.3	27.4	2.5	14.9
2-198	Obs	1.0	21.6	3.3	12.4
3-139	Obs	1.5	21.1	4.1	16.1
Basally-notched Cottonwood Triagular					
2-265	Agate	1.0	20.3	2.8	14.4
Humboldt					
3-95	Obs	2.5	35.3	4.9	14.5
3-98	Igm	7.7	57.8	5.8	24.5
2-243	Obs	2.3	41.1	3.6	13.8
2-273	Obs	3.2	50.0	4.9	14.8
3-111	Obs	3.9	38.2	5.5	19.2
Desert Side-notched					
2-141	Qzite	1.0	23.9	2.5	13.8
2-247	Chert	1.1	33.4	2.4	12.7
2-237	Chert	0.8	23.0	2.8	12.3
2-169	Agate	1.3	33.8	2.7	13.3
2-151	Igm	1.2	22.2	3.2	12.3
2-235	Obs	0.6	22.5	2.2	9.7
2-232	Obs	0.9	29.2	2.5	12.2
2-157	Obs	0.6	27.4	3.1	7.1
2-182	Obs	1.2	28.3	3.2	14.1
3-102	Obs	0.7	20.7	3.0	12.8
3-108	Obs	1.5	27.4	3.6	14.7
3-109	Obs	0.7	19.9	3.4	12.2
2-234	Obs	0.7	19.1	2.7	11.3
2-229	Obs	0.7	23.7	2.9	10.8
2-138	Obs	1.4	30.2	3.6	14.4

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (mm)
2-138	Obs	1.4	30.2	3.6	14.4
2-178	Obs	0.7	16.1	2.5	13.9
2-257	Obs	0.9	23.9	3.1	12.4
2-268	Obs	0.6	15.2	3.2	11.4
2-194	Obs	1.2	31.1	3.6	13.8
3-106	Obs	1.3	19.3	4.0	13.6
Large Side-notched					
2-73	Obs	4.4	40.7	6.0	12.6
2-191	Obs	1.7	24.8	4.5	12.5
2-239	Chert	1.5	34.5	3.4	14.5
2-282	Obs	1.1	25.9	2.5	14.7
Rosegate Series Side-notched					
2-271	Agate	1.0	20.7	3.4	12.5
2-269	Agate	1.7	35.7	5.3	13.8
2-267	Obs	0.7	23.3	3.1	11.4
2-183	Obs	1.1	26.8	2.8	13.0
3-97	Obs	0.8	22.1	2.6	13.3
3-123	Obs	1.0	24.5	2.3	13.5
Rosegate Series Corner-notched					
2-286	Obs	1.0	25.3	2.7	15.2
2-281	Obs	0.8	20.8	3.0	10.7
2-280	Obs	0.9	19.6	3.3	13.6
2-279	Obs	0.9	19.9	3.3	14.6
2-278	Obs	0.6	12.0	2.4	12.2
2-277	Obs	0.7	18.0	3.2	12.8
2-276	Obs	0.6	19.4	2.2	14.4
2-275	Obs	0.5	16.6	2.4	12.3
2-274	Obs	0.6	19.3	2.5	12.5
2-270	Obs	1.5	29.7	3.6	20.1
2-264	Igm	1.4	28.1	3.3	19.3
2-263	Chert	1.5	28.1	3.7	20.5
2-262	Obs	0.9	21.3	3.5	12.2
2-261	Obs	0.6	18.0	2.5	15.4
2-260	Obs	0.9	25.8	3.0	13.5
2-259	Obs	0.9	23.1	2.5	16.6
2-258	Agate	1.4	25.2	3.6	17.6
2-256	Obs	0.5	16.9	2.9	12.3
2-255	Obs	0.7	24.7	3.0	10.1
2-253	Chert	1.1	22.5	3.1	13.3
2-250	Obs	0.7	19.8	2.8	13.2
2-249	Obs	0.9	24.3	2.7	11.8

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (mm)
2-249	Obs	0.9	24.3	2.7	11.8
2-45	Agate	1.3	26.7	3.2	15.5
2-244	Obs	0.9	25.7	2.6	13.6
2-242	Obs	1.0	25.0	3.5	12.7
2-241	Obs	0.7	19.2	2.3	11.8
2-240	Obs	0.6	20.3	2.4	13.0
2-238	Obs	1.5	30.1	3.6	16.1
2-233	Agate	0.9	30.6	2.6	13.2
2-231	Chert	1.1	24.6	3.2	15.2
2-230	Obs	0.7	23.6	2.2	15.0
2-228	Obs	0.2	16.6	2.1	10.5
2-227	Obs	0.7	22.9	3.2	11.5
2-226	Chert	1.2	29.5	3.1	16.3
2-225	Obs	1.2	27.0	2.9	21.3
2-223	Obs	2.3	40.8	3.7	19.6
2-222	Obs	0.3	14.6	2.2	8.3
2-160	Obs	0.5	13.6	2.3	12.4
2-159	Obs	0.5	14.0	3.7	11.8
2-156	Obs	0.8	19.9	2.5	14.1
2-155	Igm	0.6	16.8	3.3	13.5
2-137	Chert	1.3	27.7	3.1	19.4
2-192	Obs	1.3	26.2	3.1	15.5
2-186	Chert	1.0	23.6	3.4	14.2
2-185	Chert	0.7	18.6	2.7	12.5
2-184	Qtz	2.0	31.6	4.7	15.2
2-176	Chert	0.6	18.4	2.3	15.0
2-80	Obs	0.4	17.2	1.8	13.3
2-79	Obs	0.5	14.7	2.1	13.4
2-76	Agate	0.9	22.5	3.0	13.5
2-72	Obs	0.7	21.4	2.5	15.0
3-110	Igm	1.4	29.8	3.5	15.0
3-112	Igm	0.9	20.4	3.6	15.6
3-114	Obs	0.9	18.9	3.6	16.3
3-122	Obs	1.0	21.7	3.4	14.4
3-94	Obs	1.1	29.5	3.3	11.7
3-99	Obs	0.6	20.4	2.7	13.5
3-93	Agate	1.0	26.4	3.2	13.2
3-107	Igm	0.7	16.3	3.3	11.5
2-197	Obs	0.4	10.1	2.4	9.6
2-144	Chert	1.0	24.3	3.5	11.2
3-126	Obs	0.3	14.6	2.6	6.8

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (mm)
3-104	Obs	1.4	23.8	4.3	15.3
Elko Series Corner-Notched					
3-96	Igm	6.1	47.1	6.3	24.6
3-132	Obs	1.0	19.0	4.0	15.5
3-130	Obs	2.1	25.1	4.7	21.4
3-113	Chert	1.0	23.5	3.7	18.4
2-71	Obs	1.1	20.3	2.7	17.3
2-70	Agate	2.1	27.5	3.7	20.7
2-78	Chert	0.8	17.2	3.2	17.2
2-81	Agate	3.5	34.6	6.6	20.5
2-170	Obs	3.0	36.3	5.4	19.9
2-55	Obs	2.3	29.7	4.7	12.2
2-56	Obs	4.2	40.1	6.3	24.2
2-57	Obs	3.3	36.0	5.1	21.8
2-171	Obs	5.4	41.1	6.3	24.6
2-172	Obs	4.1	40.1	4.4	22.3
2-173	Obs	1.0	22.1	3.4	15.7
2-199	Obs	0.8	19.2	3.0	13.9
2-143	Chert	1.1	26.3	3.4	11.6
2-147	Obs	1.3	26.3	4.0	18.7
2-152	Chert	1.1	21.3	3.1	16.7
2-154	Igm	0.9	19.5	2.9	14.7
2-236	Obs	3.1	42.6	4.3	20.2
2-246	Obs	1.4	33.8	2.8	18.1
2-248	Obs	0.7	18.7	2.4	13.7
2-252	Obs	1.3	24.9	3.5	18.3
2-254	Obs	2.2	33.5	3.2	24.6
2-266	Obs	1.8	31.2	3.5	23.1
2-272	Obs	1.3	30.4	3.1	15.5
2-283	Obs	2.5	30.7	4.9	19.2
2-284	Obs	1.2	23.2	4.1	17.2
2-285	Obs	1.2	26.3	3.3	18.2
2-287	Obs	2.2	31.0	4.2	18.2
3-91	Obs	2.4	30.4	5.8	17.8
2-189	Obs	0.9	20.5	3.5	15.7
3-127	Chert	1.7	27.5	4.3	15.1
Elko Eared					
3-90	Obs	1.9	30.2	4.6	21.1
2-54	Obs	4.2	43.5	5.9	23.6
2-174	Obs	7.2	47.0	7.3	27.4
2-82	Obs	3.8	36.8	5.5	23.8

Gatecliff Split-Stem

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (mm)
2-175	Qzite	2.8	37.8	4.9	16.8
3-128	Obs	1.0	22.3	3.4	13.4
3-125	Obs	2.5	28.3	4.6	20.3
3-101	Obs	2.6	26.9	4.4	21.8
3-103	Obs	3.0	33.5	5.4	21.2
3-105	Obs	1.9	29.3	4.1	16.2
2-149	Obs	3.0	36.0	5.8	22.3
2-150	Obs	2.8	32.4	5.7	19.6
2-251	Agate	2.5	33.8	4.1	16.5

Gatecliff Contracting Stem

2-196	Obs	1.0	19.0	4.0	16.1

OUT OF KEY

2-1	Chert	1.9	30.5	2.5	1.6
2-75	Chert	1.5	26.1	5.8	10.5
2-146	Chert	1.1	21.7	4.2	11.1
2-3	Chert	1.2	21.6	4.5	18.0
3-116	Obs	2.4	30.0	4.5	16.6
2-153	Obs	1.9	29.5	4.6	16.7
2-148	Obs	1.6	25.2	4.4	16.2
3-136	Obs	1.9	24.4	4.2	17.3
2-74	Igm	1.4	31.8	3.1	16.2
2-2	Qtz	1.2	24.5	2.9	18.3

PREFORMS Type A: Triagular shaped

3-137	Igm	0.9	19.3	3.1	15.7
2-158	Obs	0.5	14.2	2.3	13.9
3-139	Obs	1.5	21.1	4.1	16.1
2-224	Chert	1.3	27.4	2.5	14.9
3-100	Obs	1.1	22.6	3.7	13.9
2-195	Obs	1.5	23.2	3.7	15.5
3-92	Obs	1.3	22.9	3.8	16.6
3-135	Obs	0.7	20.2	3.4	11.7
2-2	Qtz	1.2	24.5	2.9	18.3
2-148	Obs	1.6	25.2	4.4	16.2
2-3	Chert	1.2	21.6	4.5	18.0
3-136	Obs	1.9	24.4	4.2	17.3

Type B: BLANKS Leaf-shaped

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (m
2-177	Obs	0.7	19.5	2.3	11.6
2-146	Chert	1.1	21.7	4.2	11.1
2-139	Igm	1.4	22.1	3.2	13.8
2-98	Obs	1.0	21.6	3.3	12.4
3-121	Obs	1.2	20.4	3.7	13.2
2-27	Obs	2.0	27.8	5.1	11.6
3-134	Obs	1.3	25.7	3.5	14.6
2-153	Obs	1.9	29.5	4.6	16.7
2-188	Obs	2.5	31.3	5.1	15.9
3-116	Obs	2.4	30.0	4.5	16.6
3-133	Obs	1.8	23.5	5.3	15.1

OTHER LITHIC ARTIFACTS MEASUREMENTS

B. Chapter 3: B. 1: **Bifaces** BLANKS

Cat No.	Raw Mat.	Wt (g)	Lgth (mm)	Thk (mm)	Wdth (mm)
2-4	Chert	22	53	13.2	30.7
3-80	Obs	7.3	42	7.4	29.2
2-9	Qutz	24.9	51.1	10.6	33.8
3-67	Obs	11.3	41.2	7.1	26.9
3-73	Obs	9.8	40.8	10.5	28.7
3-124	Ignim	0.9	18.7	3.7	16.5
Small Point	**Biface**	**Preforms**			
2-193	Obs	2.4	33.5	4.4	17.8
2-31	Obs	1.4	23.1	3.3	15.5
3-129	Obs	2.6	34.1	4.7	16.5
3-131	heat treated	2.2	22.1	5.0	20.1
Small Point	**Biface**				
2-30	Obs	3.0	24.1	7.2	16.8
2-200	Obs	0.9	21.0	3.2	11.5
3-133	Obs	1.8	23.5	5.3	15.1
2-188	Obs	2.5	31.3	5.1	15.9
2-27	Obs	2.0	27.8	5.1	11.6
2-195	Obs	1.5	23.2	3.7	15.5
3-140	Obs	1.1	20.5	3.9	17.6
Large	**Pointed**	**Bifaces**	**Preforms**		
2-50	Chert (gr)	28.6	75.2	8.6	41.5
3-24	Obs	5.4	40.0	8.8	20.8
3-60	Obs	20.9	64.1	6.0	32.7
3-117	Ignim	23.2	62.5	11.4	36.3
Large	**Pointed**	**Bifaces**			
3-61	Obs	5.5	38.2	6.5	24.3
3-75	Obs	9.6	46.2	9.6	24.7
3-52	Chert	7.6	40.6	7.8	29.5
3-144	Obs	3.7	41.8	5.5	18.1
2-44	Obs	23.4	68.9	8.6	36.6
2-47	Chert	19.3	61.7	9.7	31.0
Bipoint	**Preforms**				
2-48	Agate	21.7	75.2	13.4	26.8
2-83	Obs	19.3	73.6	8.9	25.6
2-51	Chert	15.7	54.3	11.4	24.9

Cat. No.	Raw Mat.	Wt (g)	Lgt (mm)	Thk (mm)	Wth (mm)
Ovoid	**Preforms**				
3-21	Obs	8.1	52.8	6.7	23.5
3-143	Ignim	9.4	32.8	6.6	33.8
2-15	Qutz	5.1	37.7	6.1	19.6
3-118	Ignim	14.3	53.7	8.8	32.4
3-39	Chert	16.4	40.4	11.7	38.0
2-43	Obs	49.0	99.2	11.6	40.0
3-84	Chert	11.9	51.7	8.6	28.7
3-145	Obs	3.3	37.9	5.4	22.4
3-71	Ignm	8.5	44.1	7.2	29.7
Scalpel	**Bifaces**				
2-58	Qutz	1.8	32.2	3.6	13.2
3-147	Obs	4.2	38.7	6.1	18.3
RETOUCHED FLAKES					
2-10	Qzt	8.4	27.4	9.5	27.5
3-74	Ignim	12.3	37.3	6.5	33.1
2-46	Obs	6.1	34.0	6.2	31.1
3-70	Obs	6.6	42.6	6.6	28.9
3-23	Obs	4.8	31.3	6.3	29.7
2-28	Obs	4.2	22.7	8.3	22.5
3-35	Qtz	4.9	33.4	7.5	18.0
3-31	Obs	6.1	44.0	7.7	30.6
3-119	Chert	12.7	49.2	7.8	32.7
2-45	Obs	26.5	60.7	14.6	35.9
3-66	Obs	15.6	56.6	7.7	40.4
3-34	Obs	18.1	61.2	12.2	33.8
RETOUCHED DEBITAGE					
3-54	Siltstone	34.2	77.6	5.2	54.4
3-78	Chert	12.3	38.2	10.4	41.0
RETOUCHED BLadES					
2-52	Chert	4.7	47.4	4.9	19.6
3-48	Obs	5.0	50.1	5.6	20.1
3-38	Chert	4.5	49.4	4.9	24.2
2-53	Obs	5.4	56.1	5.2	12.4
3-25	Obs	4.5	41.8	5.7	23.3
3-77	Obs	7.8	41.2	8.1	24.7

SCRAPERS

Type Ii: Bifacial End Scraper

Cat. No.	Raw Mat.	Wt (g)	Lgt (mm)	Thk (mm)	Wth (mm)
3-45	Chert	9.1	44.2	7.4	28.0
3-22	Chert	6.7	24.3	10.4	24.4
2-18	Chert	11.4	34.4	10.1	30.2
3-138	Obs	0.9	16.8	2.3	14.4
2-5	Qutz	4.6	25.6	6.4	20.3

Type Iii: Bifacial Side Scraper

2-187	Chert	3.5	33.5	7.3	16.0
3-146	Chert	1.8	24.7	5.1	15.6
3-50	Chert	3.4	26.8	8.7	14.7
2-69	Agate	3.1	33.7	5.3	19.1
3-72	Obs	7.9	37.8	8.8	23.1
2-190	Obs	1.1	23.5	4.6	15.4
3-83	Obs	3.6	26.2	7.2	18.0
3-141	Obs	1.8	23.0	4.2	17.0

TYPE II UNIFACIAL SCRAPERS.

Type IIAi: Debitage End Scraper

3-42	Obs	6.2	31.0	8.8	24.5
3-80	Agate	6.2	18.1	9.3	27.4
3-47	Chert	2.2	19.5	6.0	19.7
3-59	Chert	2.8	19.4	5.0	22.5
3-69	Chert	8.7	24.2	8.8	30.7
3-40	Chert	10.6	32.2	7.5	26.0
3-76	Chert	9.9	40.5	9.3	23.2

Type IIAii: Debitage Side Scraper

3-81	Chert	4.2	32.1	7.8	14.5
3-41	Siltstone	11.7	43.9	6.4	56.8
3-49	Vit. Qzt	5.2	29.2	7.4	17.9
3-32	Obs	3.0	23.5	6.4	17.3

SCRAPERS CONTINUED

Cat. No.	Raw Mat.	Wt (g)	Lgt (mm)	Thk (mm)	Wth (mm)
Type IIBiii: Debitage Composite Scraper:					
3-79	Obs	6.7	32.4	8.1	31.8
3-28	Obs	10.2	45.5	8.2	26.8
2-25	Obs	14.6	39.7	11.7	35.2
2-24	Obs	62.2	82.0	12.9	49.9
3-68	Chert	21.3	41.3	9.0	45.0
2-6	Quartz	6.1	21.3	9.8	21.6
Type IIBiv: Core Fragment Scraper:					
2-14	Chert	43.0	51.0	20.2	42.2
Type IIBv: Convergent Scraper:					
2-142	Chert	3.7	34.4	6.2	21.2

<u>TYPE IIA: FLAKE SCRAPERS</u>

Type IIAi: Flake End Scraper:					
3-56	Chert	13.2	43.3	11.3	27.2
2-12	Chert	8.[illegible]	40.0	12.3	26.4
3-51	Vit. Qzt	6.8	31.6	6.5	33.7
3-44	Pet. Wood	12.7	37.3	9.6	30.2
3-62	Vit. Qzt	8.2	32.0	8.3	30.3
3-58	Chert	4.6	21.3	6.1	27.4
3-120	Obs	1.7	2[illegible].8	5.0	16.4
Type IIAii: Flake Side Scraper:					
2-29	Obs	20.1	57.6	12.8	32.5
3-85	Obs	8.9	52.8	6.7	36.8
3-63	Obs	26.2	63.2	11.7	39.4
3-142	Chert	15.0	47.6	7.0	47.6
3-115	Obs	5.1	30.0	10.7	22.0
3-27	Obs	2.1	26.4	6.2	15.4
3-27	Obs	2.7	31.7	5.3	17.2
2-8	Chert	6.7	29.9	9.9	23.5
Type IIAiii: Flake Composite Scraper:					
2-26	Ignim	9.3	40.8	10.8	24.2
3-29	Ignim	12.8	44.2	8.1	25.7
2-17	Quartz	10.4	35.6	12.0	24.6
2-7	Vit. Qtz	7.1	35.3	6.3	28.8
3-46	Chert	4.8	30.5	6.7	24.0
2-13	Chert	11.4	37.1	13.5	32.2
3-53	Chert	4.8	25.3	6.3	26.0
2-19	Chert	7.2	38.8	9.5	28.4
2-21	Chert	25.2	65.2	9.9	33.0
2-16	Chert	14.5	41.9	10.2	31.8

Cat. No.	Raw Mat.	Wt (g)	Lgt (mm)	Thk (mm)	Wth (mm)
2-37	Obs	1.4	21.9	5.3	14.8
2-77	Obs	4.0	25.1	12.6	25.0
3-26	Obs	16.4	44.5	10.1	37.8

Type IIAiv: Snubnosed Scraper

3-82	Chert	7.4	35.8	9.4	24.0
2-11	Chert	8.0	27.3	9.6	27.5
3-57	Qzt	8.5	23.5	10.7	28.0
3-55	Agate	5.9	28.5	11.2	22.4
2-20	Chert	4.3	29.7	8.5	18.6

AWLS & DRILLS

2-180	Siltstone	0.9	25.3	3.0	13.9
2-140	Chert	0.8	25.5	2.8	11.2
2-145	Agate	1.9	26.8	3.8	22.3
2-181	Chert	[illegible].3	42.8	3.2	18.1
2-179	Chert	3.0	39.6	6.7	12.9
3-43	Chert	2.8	49.6	5.2	13.2

SHAFT SMOOTHERS

3-64	Sandst	36.6	51.1	16.7	28.2
3-65	Sandst	70.8	56.8	20.4	48.5
2-22	Sandst	71.5	68.3	18.6	48.0
2-23	Sandst	58.9	82.2	19.8	31.6

MISCELLANEOUS GROUND LITHICS

3-30	Basalt	2.7	35.4	7.6	7.5
2-163	Tuff	2.3	20.5	4.1	21.5
3-36	Basalt	1.8	25.3	4.3	10.3
2-220	Basalt	10.1	41.0	13.9	13.1

MISCELLANEOUS LITHICS (collective measurements) PEBBLES

Lot # 2-221	(n=36)	31.4	10.0 (avg)	8.0 (avg)	8.6 (avg)
Lot # 3-1	(n=39)	46.6	15.5 (avg)	8.9 (avg)	11.2 (avg)

Table 4-1 Gaming Pieces, TYPE A

KEY

Ob - Obsidian	¥ - Tip
sin - Sinew	ø - Convex
* - Bird bone	$ - Burnt white/gray colour
# - Broken	@ - Burnt/smoked Black
Σ- Ochre	(@) - Pigment
& - Gnawed	

Cat. No.	Class	Wt (g)	Lgt (mm)	Tk (mm)	Wd (mm)	Comment
2-86	stage 3	0.8	12.7	4.4	11.0	
3-14	stage 3	0.8	28.9	2.4	10.8	
2-39	stage 3	2.0	32.2	2.9	16.1	
3-6	stage 3	1.9	37.1	3.5	12.7	
3-160	stage 3	1.7	33.8	4.1	14.6	
3-9	stage 3	2.4	34.7	4.4	17.5	$
2-42	stage 3	3.2	50.5	3.6	13.5	@
3-16	stage 4	1.8	21.6	4.8	15.6	
3-10	stage 4	1.4	19.4	2.7	17.7	
2-91	stage 4	1.1	21.3	1.9	15.2	
2-87	stage 4	1.0	24.7	2.8	10.5	
2-85	stage 4	1.5	16.9	4.2	17.2	
3-173	stage 4	1.9	19.4	4.0	19.6	
3-173	stage 4	1.9	21.3	3.7	18.2	
3-172	stage 4	0.9	21.8	3.3	13.8	
2-63	stage 4	1.4	22.0	3.1	14.4	
2-96	stage 4	1.4	21.4	4.1	12.9	
3-18	stage 4	1.1	22.2	3.6	13.6	
3-168	stage 4	2.8	27.7	4.5	19.7	
3-167	stage 4	1.9	20.0	3.4	18.[illegible]	
3-166	stage 4	2.5	24.0	4.4	19.5	
3-161	stage 4	2.6	25.4	4.5	19.7	
2-92	stage 4	1.7	23.5	2.9	16.7	
2-49	stage 4	2.5	24.5	5.3	16.5	
2-60	stage 4	1.7	25.2	3.5	1[illegible].9	
2-41	stage 4	2.5	23.3	5.1	14.2	
2-88	stage 4	1.8	21.6	3.8	14.[illegible]	
2-59	stage 4	2.1	21.6	4.7	18.7	
2-65	stage 4	2.7	29.3	4.3	18.8	
2-89	stage 4	1.9	23.4	4.1	15.1	

Cat. No.	Class.	Wt (g)	Lgt (mm)	Tk (mm)	Wd (mm)	Comment
2-38	stage 4	1.5	23.8	3.7	15.5	
3-159	stage 4	1.8	36.8	3.6	16.8	
2-68	stage 4	2.3	26.3	4.8	12.5	
3-164	stage 4	1.7	22.4	3.5	14.2	
2-34	stage 4	2.1	30.2	2.5	21.0	
3-170	stage 4	2.4	28.1	4.7	12.4	
3-169	stage 4	2.1	27.1	4.0	18.4	
3-19	stage 4	2.4	25.2	3.8	14.8	
3-171	stage 4	1.1	15.3	5.0	7.3	
2-61	stage 4	1.7	25.8	3.7	14.7	beveled
3-17	stage 4	1.8	26.9	4.1	16.8	beveled
2-90	stage 4	2.5	29.1	4.3	17.2	beveled
2-84	stage 4	0.9	18.3	4.2	11.9	
3-11	stage 5	1.3	17.7	4.9	16.7	#
3-13	stage 5	2.8	26.8	6.1	15.5	&
2-62	stage 5	0.9	15.4	2.2	13.9	lines
3-175	stage 5	2.3	22.4	4.3	13.7	@ diagn.
3-12	stage 5	1.0	22.4	2.5	11.1	@ lines
3-5	stage 5	1.0	22.5	2.5	14.9	@ lines
2-94	stage 5	1.7	28.5	3.7	16.1	serrated
3-7	stage 5	2.2	22.8	4.3	18.3	
3-3	stage 5	1.2	20.0	3.8	13.8	serrated
2-33	stage 5	2.9	29.4	3.3	21.3	$ white
3-8	stage 5	1.8	31.0	4.3	17.2	@ black
2-84	stage 5	1.0	18.5	4.2	12.0	(@) Dr. B
3-163	stage 5	2.2	26.4	3.9	16.1	@
3-15	stage 5	1.8	17.8	4.5	19.6	° yellow
3-177	stage 5	2.0	19.5	4.0	19.5	° red
3-176	stage 5	1.8	20.1	4.2	18.6	° red
3-165	stage 5	1.6	19.3	3.6	19.3	° red
2-64	stage 5	2.5	24.9	4.1	12.8	° red
3-162	stage 5	1.8	25.8	2.1	17.0	° red
2-67	stage 5	2.5	27.1	4.9	13.4	bored
2-37	stage 5	2.9	28.8	5.7	18.8	bored
2-95	stage 5	1.2	23.2	2.6	16.7	design
3-174	stage 5	1.6	24.8	3.2	14.7	design

Table 4-2 Gaming Pieces, TYPE B

Cat. No.	Class	Wt (g)	Lth (mm)	Tk (mm)	Wd (mm)	Comment
2-110		5.0	57.2	3.8	19.0	beveled
3-158		4.1	48.2	4.8	12.8	beveled
3-156		8.3	99.0	3.1	24.8	° red
2-35		2.5	47.0	2.9	16.3	
2-36		3.7	56.4	3.8	20.4	
3-4		1.9	30.4	4.2	14.9	#

Table 4-3 Bone Awls

Cat. No.	Class	Wt (g)	Lth (mm)	Tk (mm)	Wd (mm)	Comment
3-20	Ulna Awl	4.2	163.0	18.0	29.0	
2-100	Scap Awl	11.0	112.5	9.6	27.8	
2-114	" Awl	2.1	75.9	13.7	15.5	
2-112	" Awl	5.3	82.9	8.7	21.3	
2-107	" Awl	2.9	57.4	8.2	20.2	
2-113	Splin Awl	1.9	68.1	1.9	8.6	# *
2-115	" Awl	5.8	91.4	4.4	10.3	St. * Σ
3-150	" Awl	7.0	117.0	12.2	21.6	Not split
3-152	" Awl	5.9	104.6	4.1	14.1	St
2-108	" Awl	4.9	98.4	5.4	11.5	&
2-106	" Awl	4.3	69.7	4.7	15.1	
3-148	" Awl	4.1	62.1	5.0	15.3	
2-98	" Awl	3.7	94.2	4.8	12.2	
3-153	" Awl	6.8	99.0	6.1	16.8	Σ
3-149	" Awl	1.1	47.3	4.0	7.3	
2-104	" Awl	0.7	32.5	3.4	13.1	#¥
2-109	" Awl	5.0	95.3	5.4	21.9	
2-111	" Awl	1.8	70.1	2.1	9.9	
2-97	" Awl	3.8	113.4	3.6	12.8	Blunt tip
2-105	" Awl	1.0	34.0	4.3	6.7	ø¥

Table 4-4 Flint Knapping Tools

Cat No.	Class	Wt (g)	Lth (mm)	Tk (mm)	Wd (mm)	Comment
2-40	Flaker	4.5	48.6	6.6	9.9	Ob. Flake
2-99	Flaker	12.7	144.9	8.2	10.6	Antler
3-88	Flaker	14.4	78.5	11.1	16.6	
3-151	Flaker	11.6	98.0	13.3	16.3	Antler

Table 4-5 Bow

2-217	Bow	17.3	230.3	4.1	14.0	Rib & Sin

Table 4-6 Beads

3-157	bead	3.5	48.2	4.1	11.9	
3-155	pendant	2.1	52.8	1.9	14.2	serrated
3-154	pendant	2.8	48.6	2.8	15.0	@
2-116	pendant	2.5	23.7	9.6	15.4	elk tooth
2-102	tube	1.3	26.4	7.9	8.9	*
2-103	tube	0.3	6.6	4.5	5.4	*
2-101	tube	2.0	50.7	6.5	8.5	*

Table 4-7 Miscellaneous

3-179	serrated	2.6	34.2	2.1	27.4	°
2-32	zig-zag	3.6	38.0	2.5	25.3	
2-66	engraved	1.2	31.6	1.5	20.0	

Chapter 5: TABLE 5-1 OTHER PERISHABLE ARTIFACTS

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (mm)
Knife or Scraper Handle					
2-133	wood	10.2	112.3	15.3	15.1
3-183	wood	22.1	138.7	12.1	23.3
Bows					
2-218	wood	9.4	322.0	6.5	13.3
2-136	wood	50.1	534.3	18.8	19.2
Dart/Atlatl Shafts - Composite and Simple					
2-128	Cane	0.5	49.6	8.0	11.3
2-126	Cane	0.9	25.2	9.5	9.4
2-123	Cane	0.6	26.9	8.5	9.7
2-125	Cane	0.7	33.0	8.0	10.3
2-134	Cane	2.1	141.5	7.5	12.8
2-132	Cane	2.9	122.5	10.8	12.4
2-130	Cane	1.7	117.0	9.9	10.0
3-182	Cane	1.1	96.7	6.1	10.5
2-121	H. Wood	3.2	69.4	9.4	11.4
2-131	H. Wood	4.2	142.5	7.8	7.9
2-119	H. Wood	1.0	44.2	6.3	6.7
2-120	[illegible]	1.4	55.5	7.0	7.1
2-118	H. Wood	0.8	62.8	6.7	6.1
2-124	Cane	0.55	35.0	9.4	9.1
2-135	H. Wood	8.7	276.2	7.1	7.0
Hard Wood Detrius					
2-164	H. Wood	1.1	26.6	8.7	8.5
2-127	H. Wood	0.8	21.6	9.4	11.9
3-180	H. Wood	3.1	130.3	6.2	6.2
2-117	H. Wood	1.9	86.8	7.2	7.2
2-122	H. Wood	2.4	78.4	7.5	7.6
2-165	H. Wood	2.0	81.5	6.7	12.0
3-181	H. Wood	2.7	138.2	7.7	7.2
2-162	H. Wood	1.1	79.1	6.3	6.9
3-2	H. Wood	3.5	47.1	14.7	16.2
Cane Detrius					
2-129	Cane	0.3	27.4	1.8	8.1
1-161	Cane	1.9	114.0	5.6	16.1

Cordage and Composite Perishable Artifacts

Cat. No.	Raw Mat.	Wt. (g)	Lgt. (mm)	Thk. (mm)	Wth. (mm)
2-201	V. Fibers	1.6	1[illegible].0	7.5	8.7
2-216	V. Fibers	13.9	529.0	12.2	16.9
2-167	V. Fibers	0.6	129.0	6.0	6.0
2-168	V. Fibers	0.2	65.0	4-6.0	4.0
2-215	V. Fibers	1.8	295.0	8.1	13.2
2-214	V. Fibers	1.7	233.0	9.5	10.7
2-204	V. Fibers	0.8	55.3	9.6	20.6
2-213	V. Fibers	1.4	33.0	7.0	26.1
3-89	W & Fib.	5.5	101.8	17.1	22.0
2-203	V. Fibers	2.3	71.6	10.7	34.7
2-202	Fib. & Bone	4.6	57.1	15.0	20.1

Leather Perishable Artifacts

2-219	Leather	61.7	206.3	47.3	69.5
2-206	Leather	4.3	89.4	8.2	32.7

CHAPTER 6: POTTERY

GREAT SALT LAKE GRAY WARE

Tkness	Length	Width	ventral surf.	Dorsal surf.	Sf. Colour
5.4	37.5	30.5	no	no	grey/pink
5.4	38.2	21.3	5% carbon	[illegible]	black/grey
5.4	55.1	32.3	55% carbon	brushed	grey/bwn
6.1	64.1	28.2	95% carbon	brushed	black
5.1	40.7	35.4	no	blackened/brd	grey
*6.1	38.6	23.2	brushed	brushed	black/grey
4.7	36.2	29.1	blackened	brushed	grey
3.7	30.2	22	no	no	white/crm
4.8	31.4	22.4	no	no	grey/pink
5.4	25.5	19.6	no	no	grey
4.3	21.3	13.9	no	no	grey/pink
6.2	32.5	16.2	no	brushed	white/crm
4.8	31.2	19.8	no	no	bwn/pink
4.7	32.1	31.2	no	brushed	grey
5.8	30.7	23.1	blackened	brushed	grey/bwn
4.3	25.5	19.5	no	no	grey
5.2	33.3	19.3	brushed	brushed	grey/pink
5.5	57.1	44.4	no	no	grey/pink
5.6	60.3	53	5% carbon	brushed	grey/black
*5.3	43.6	27.8	100% carbon	brushed	grey/black
5.1	41.4	37.5	no	brushed	grey/tan
5.1	39.2	33.8	no	insised/ bl pnt	grey/tan
5.8	40.3	33.1	100% carbon	no	grey/black
*5.3	41.3	29.5	no	no	grey/pink
5.3	28.2	22.8	blackened	brushed	grey/black
#7.1	59.4	52	100% carbon	brushed (base)	grey/wht

Rim Sherds

Thkness	Length	Width	ventral Surf.	Dorsal surf.	Rim form	Lip form
5.3	36.9	42.6	black	fing nail punc	flaring	bulbous
5.5	36	35.4	black	no	flaring	bulbous
5.9	38	30.3	black	fing nail punc	flaring	bulbous
5.7	48.3	39.3	black/grey	fing nail punc	horizontal	square
6.2	47.2	54.6	black	fing nail punc	flaring	tucked bulb
# 9.2	34.3	33.2	no	fing nail punc	flaring	tucked bulb

# 6.6	34.7	30.8	100% carbon	brushed	horizontal	straight
# 6.0	56.7	63.5	100% carbon	rim punc	horizontal	sl. bulbous
# 7.8	37.4	33.1	100% carbon	rim punc	horizontal	square
# 6.3	49.1	49.2	100% carbon	herring bn r.p.	horizontal	bulbous

Perron
* Sample taken

SHOSHONE WARE POTTERY

Thkness	lgth	width	Ventral surf.	Dorsal surf.	Surf. colour
6.5	30.1	26	blackened	brushed	lt. grey
8.6	35.9	28.8	no	no	lt. brown
8.7	33.8	32.2	blackened	no	lt. br/grey
9.1	35.7	32.6	no	brushed	lt. br/grey
9.7	34.8	24.1	blackened	no	lt. brown
7.7	37.3	37.9	no	no	lt. brown
11	40.6	25.4	10% black	no	lt. brown
8.3	32	24.4	25% carbon	no	lt. brown
* 9.7	28.9	22.8	no	no	lt. br/grey
7.4	34.4	26.4	blackened	no	lt.brown
8.3	26.2	13.5	blackened	no	lt. brown
7.3	36.8	42.2	blackened °	no	lt. brown
8.8	33.7	27.2	no	brushed	lt. brown
9.5	46.7	37	blackened	potlids	lt. brown
9	43.2	31.5	blackened	Dr(3.1 mm)	black/lt. br
6.9	36.6	23.8	10% carbon	Dr(5.3 mm)	black/grey
7.3	38	21.3	blackened	no	lt. brown
10.2	40.5	24	blackened	no	lt. brown
11.1	43.2	34.4	10% black	no	lt. brown
*9.2	19.2	16.3	no	no	lt. brown
7.1	39.1	30.1	no	brushed	black/grey
7.2	24.4	23.5	10% black	striations	lt. brown
9	19.9	15.3	no	Dr (4.8 mm)	lt. brown
7	31.7	25.2	100% carbon	striations	lt. br/grey
7.2	36	27.7	blackened	striations	lt. brown
* 7.2	35.5	32.9	80% black	brushed	lt. brown
6.5	38	30.7	40% black	blackened	black/bwn
6.7	28	25.2	blackened	blackened	black
6.6	25.5	23.1	no	no	lt./dr.bwn
7.2	25.8	20.2	100% carbon	brushed	lt. brown
8.4	23	14.7	no	brushed	lt. brown

Rim sherds

Thkness	Lgth	Width	Ventral surf.	Dorsal surf.	surf. colour	Rimfrm	Lipfrm
7.8	36	40	100% carbon	brushed	lt. brown	hzontal	square
7.7	29.2	35.3	no	brushed	lt. brown	hzontal	square
8.7	18.5	18.8	no	no	lt. brown	hzontal	square
9	19.2	29.1	blackened	no	lt. brown	hzontal	square
6	21.4	33.4	blackened	brushed	black	hzontal	square
6.6	29	37.2	no	brushed	lt. brown	hzontal	square
9.3	26.7	29.3	blackened	no	grey/bwn	hzontal	square
7.6	26.1	36.2	100% carbon	blackened	black/bwn	hzontal	square

APPENDIX B:

ARTIFACT ILLUSTRATIONS

ARTIFACT ILLUSTRATIONS

All illustrations are drawn 1: 1, unless otherwise marked

LEGEND:

- - - - : Broken

. . . . . : Edge-wear micro-flake damage

: Cortex

. . . . . . : Use-wear polish

: The direction of use-wear polish striations

↦ : Bulb of percussion

: Burination

: Raw material internal impurities

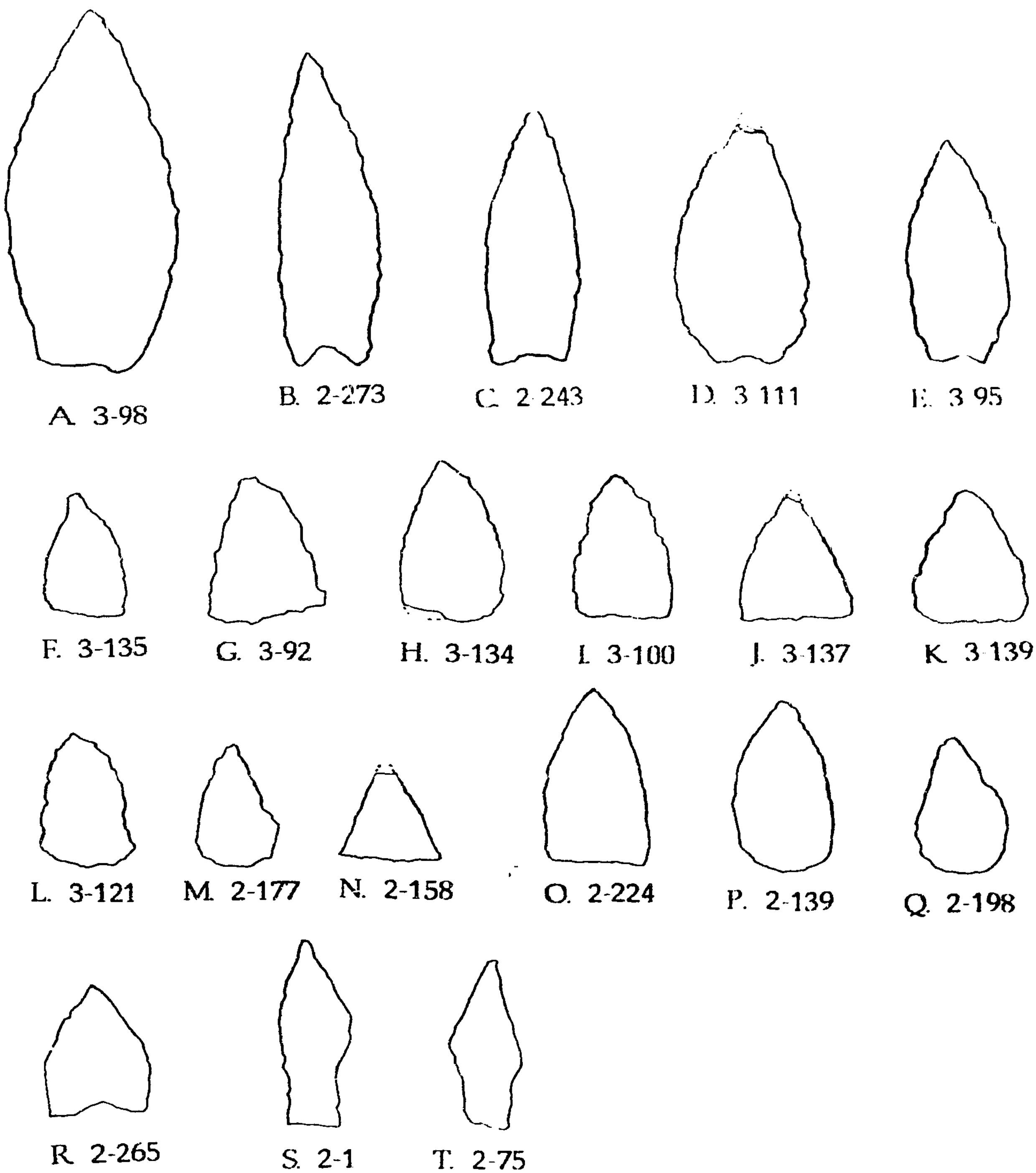

Fig. 1 A-E: Humbolt Series; F-K: Cottonwood Triangular; L-Q: Cottonwood Leafshaped; R: Basally Notched Cottonwood Triangular; S-T: Out of Key.

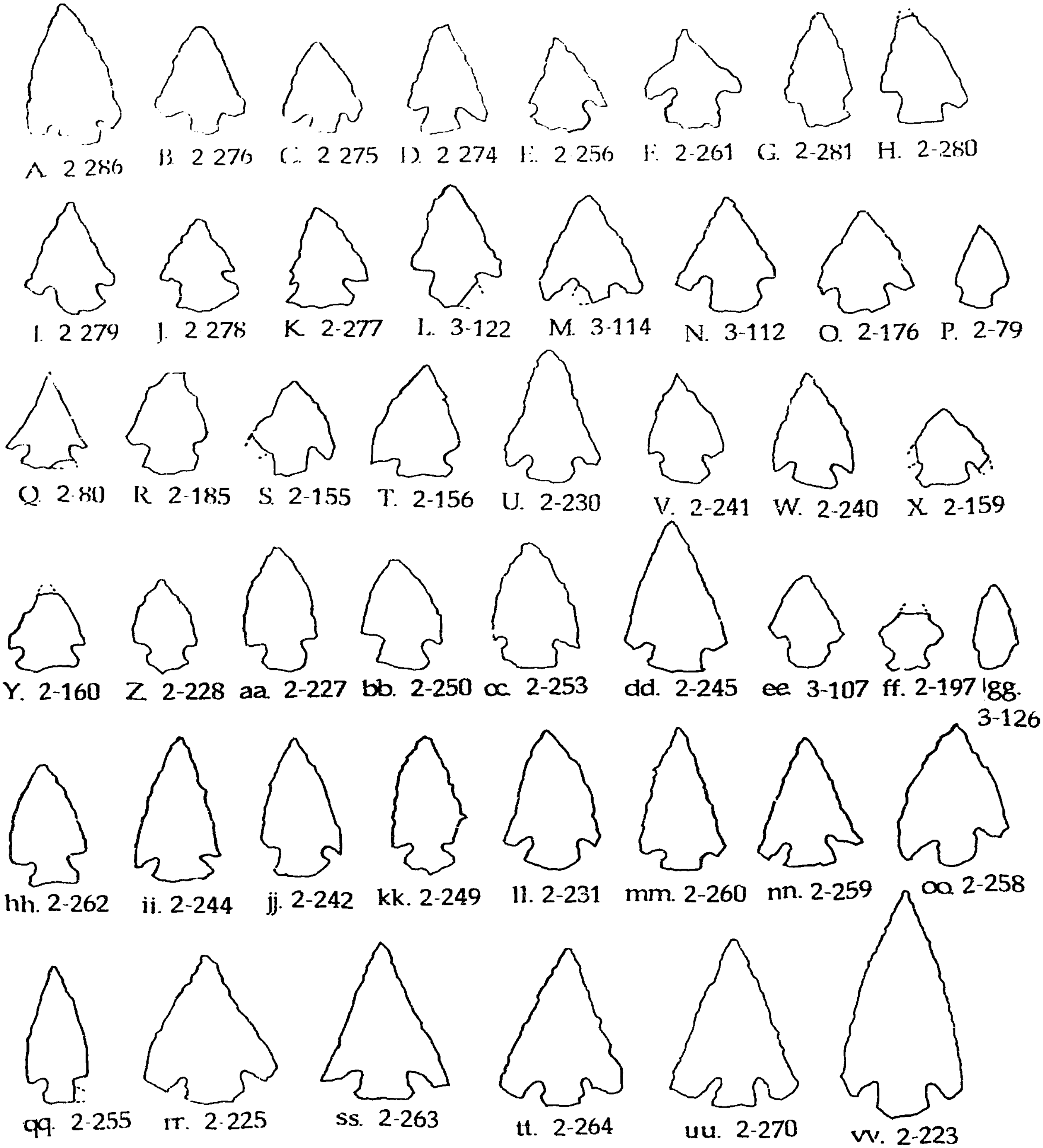

Fig. 2 A - ww: Rosegate Corner-notched

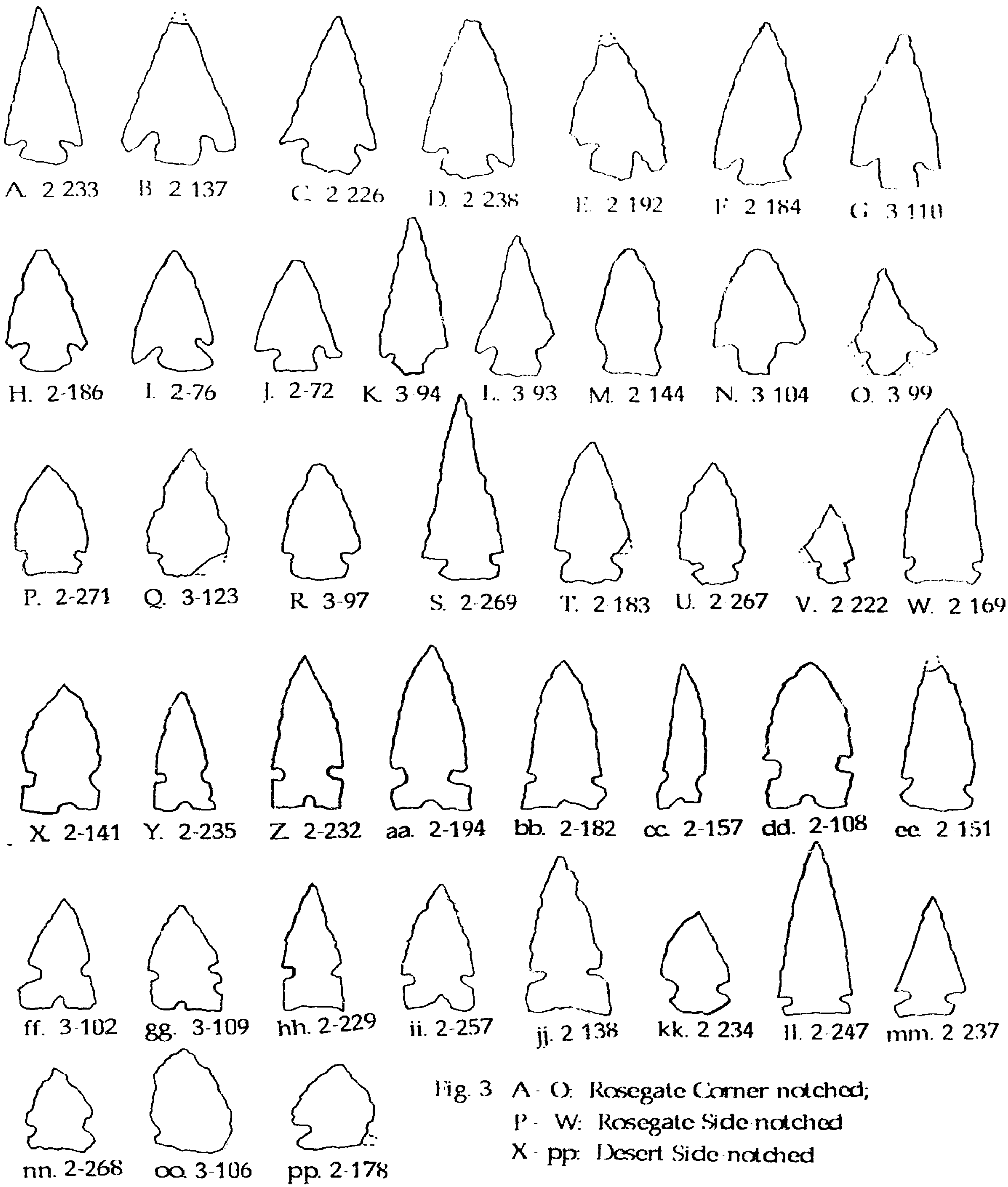

Fig. 3 A - O: Rosegate Corner notched;
P - W: Rosegate Side notched
X - pp: Desert Side-notched

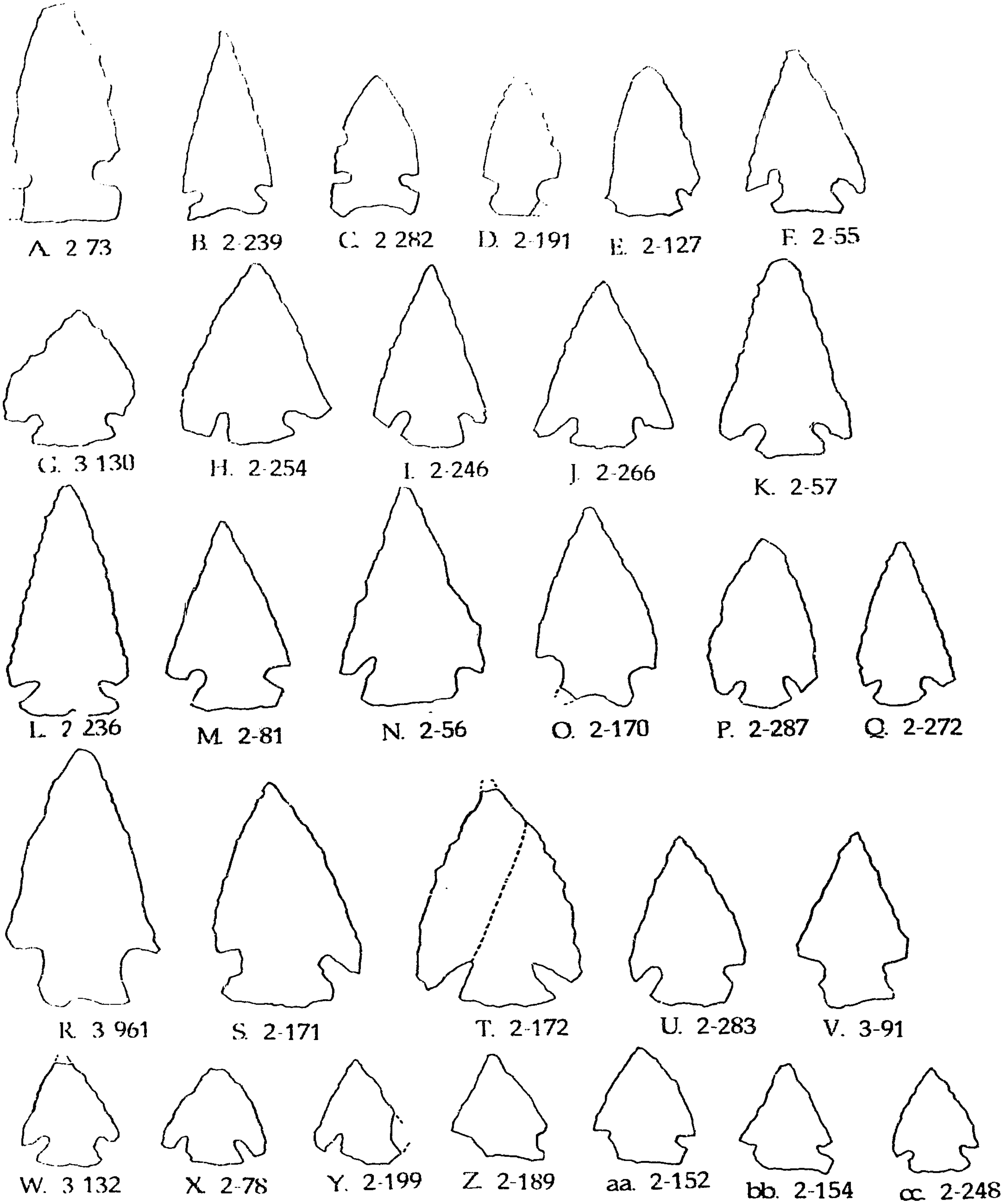

Fig. 4 A D: Large Side-notched; E - cc Elko Series Corner-notched

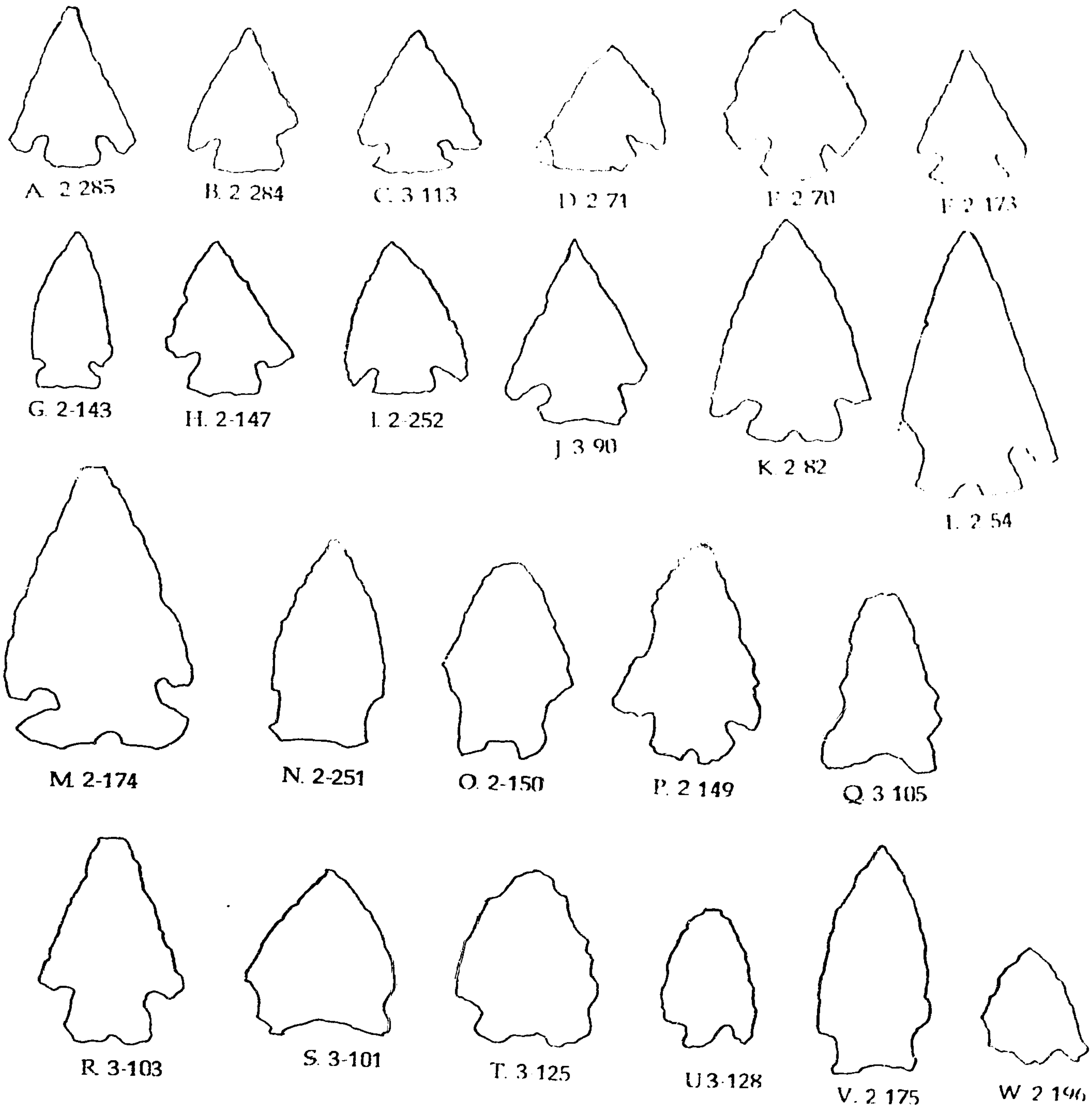

Fig. 5 A - J: Elko Series; K - M: Elko Eared Corner-notched; N - V: Gatecliff Split-stem; W: Gatecliff Contracting stem.

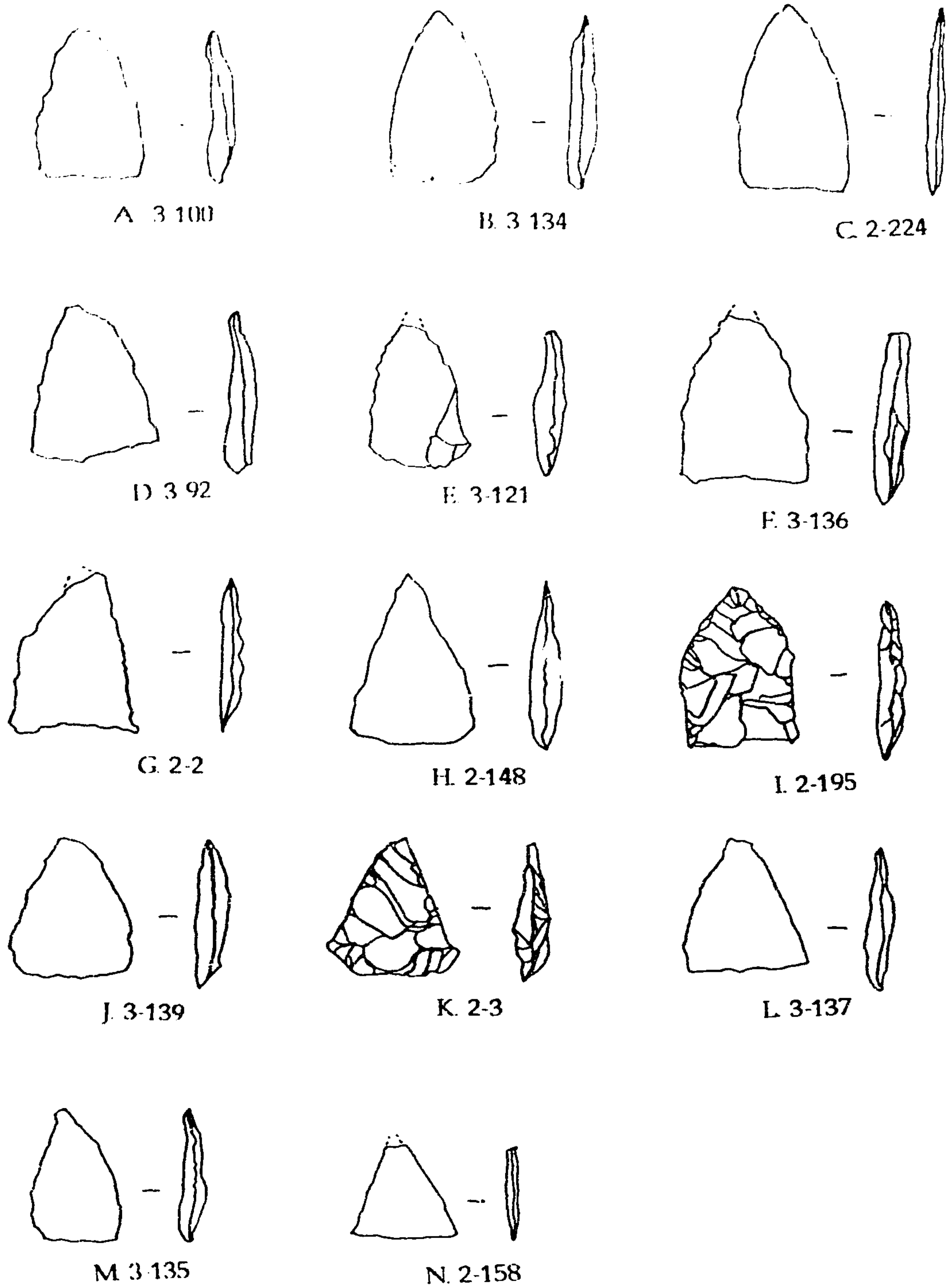

Fig. 6 Type A Triangular shaped preforms

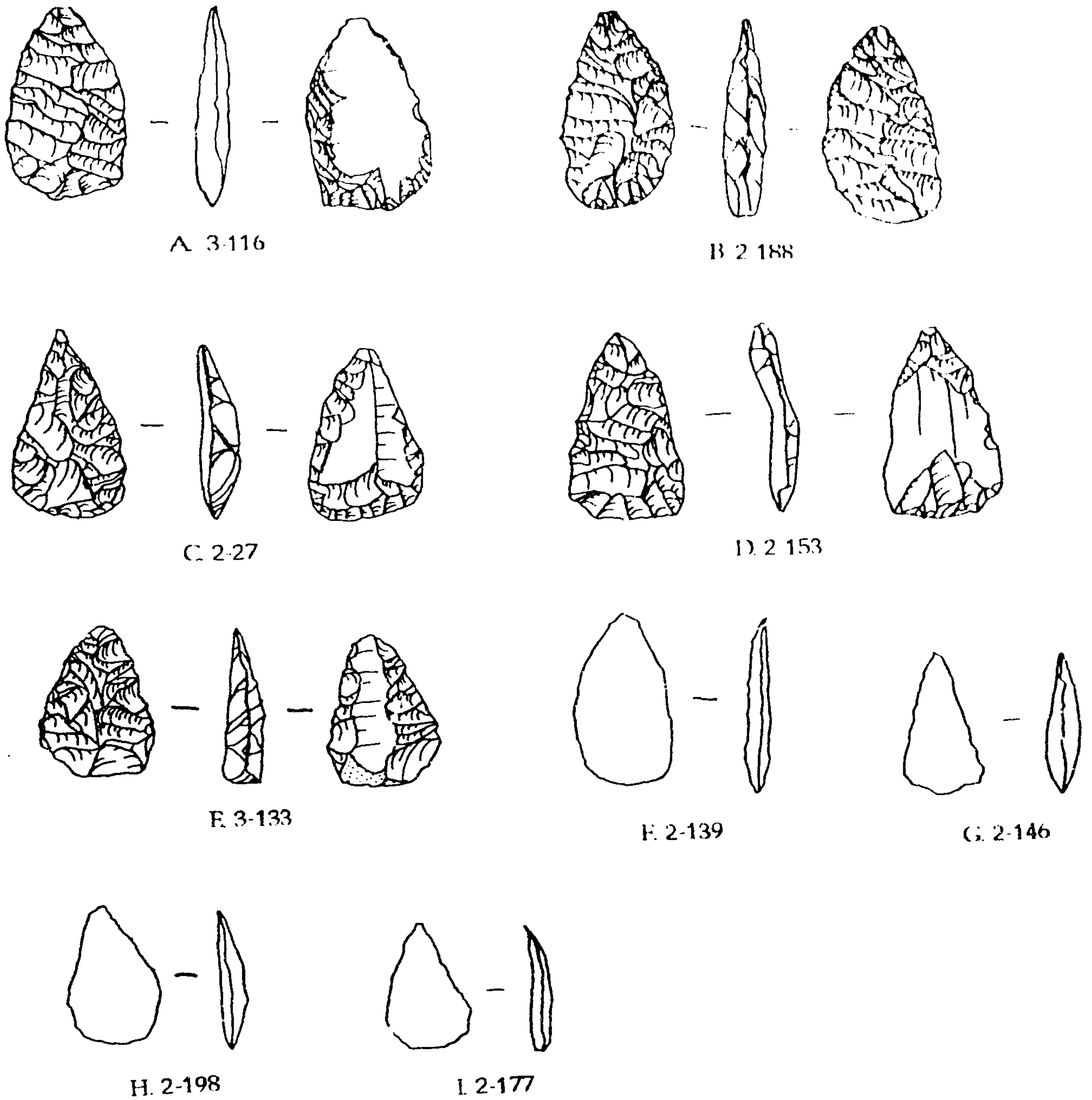

Fig. 7 Type B. Leaf-shaped, basally rounded Blanks/preforms

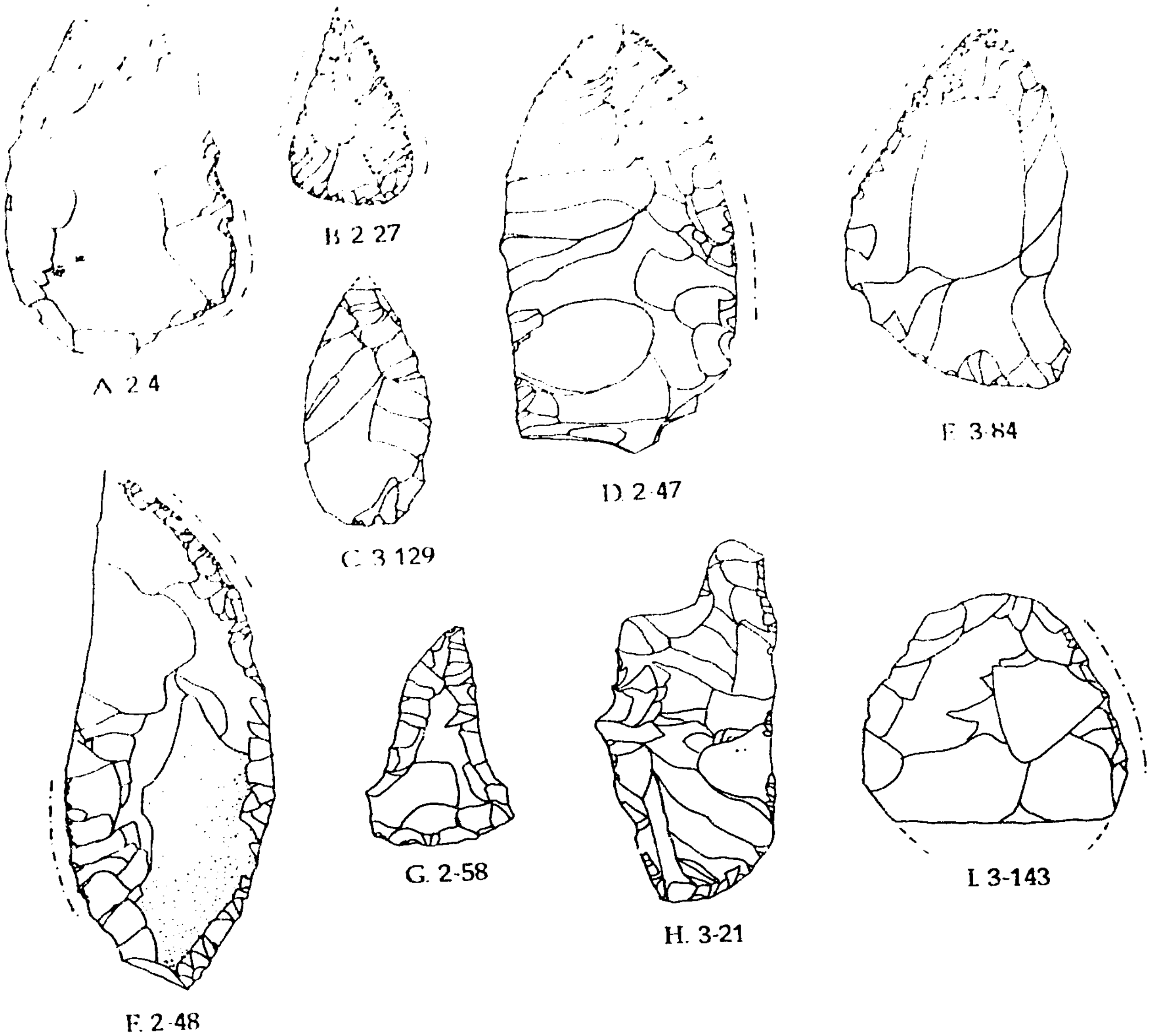

Fig. 8 A: Biface blank; B: Small pointed biface; C: Small pointed biface preform
D: Large pointed biface; E: Scalpel preform; F: Bi-pointed biface preform
G: Scalpel biface; H: Ovoid biface; I: Ovoid biface preform.

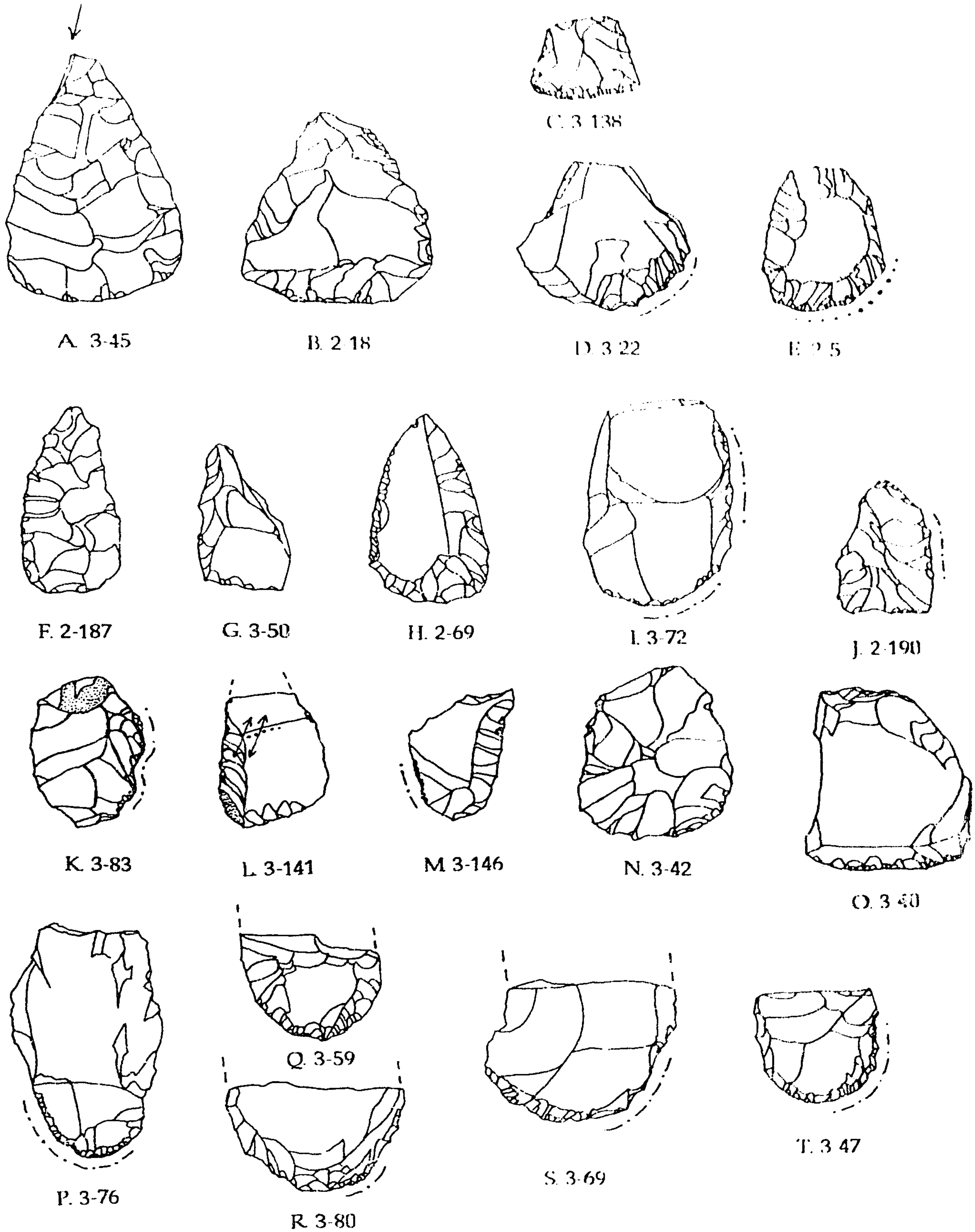

Fig. 9 A - E: Type Ii Bifacial end scrapers; F - M: Type Iii Bifacial side scrapers; N - T: Debitage end scrapers

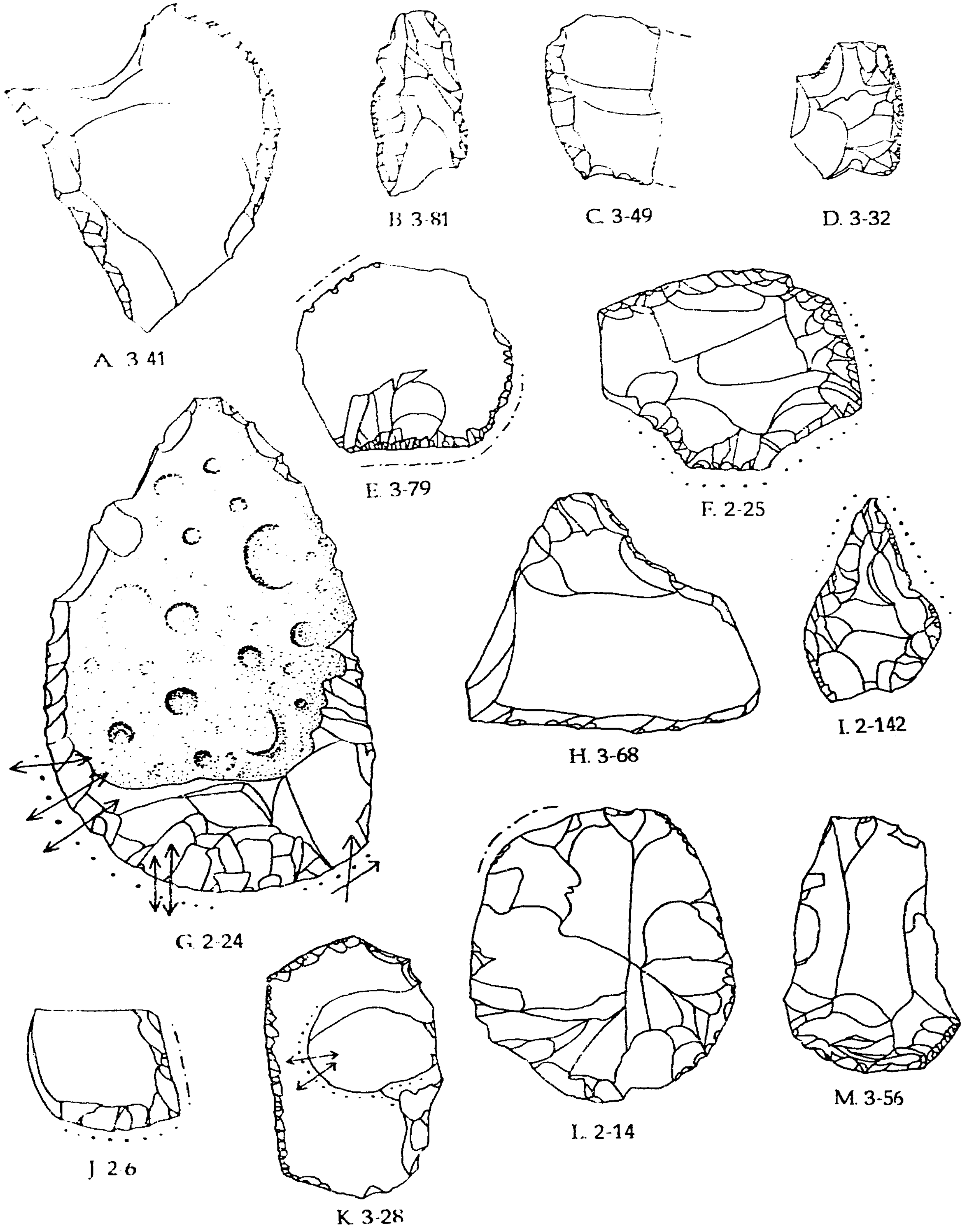

Fig. 10 A - D: Type IIAii Debitage side scrapers; E - H, J & K Type IIAiii Debitage Composite scraper; I: Debitage convergent scraper; L: Type IIAiv Core fragment scraper; M: Type IIBi Flake end scraper.

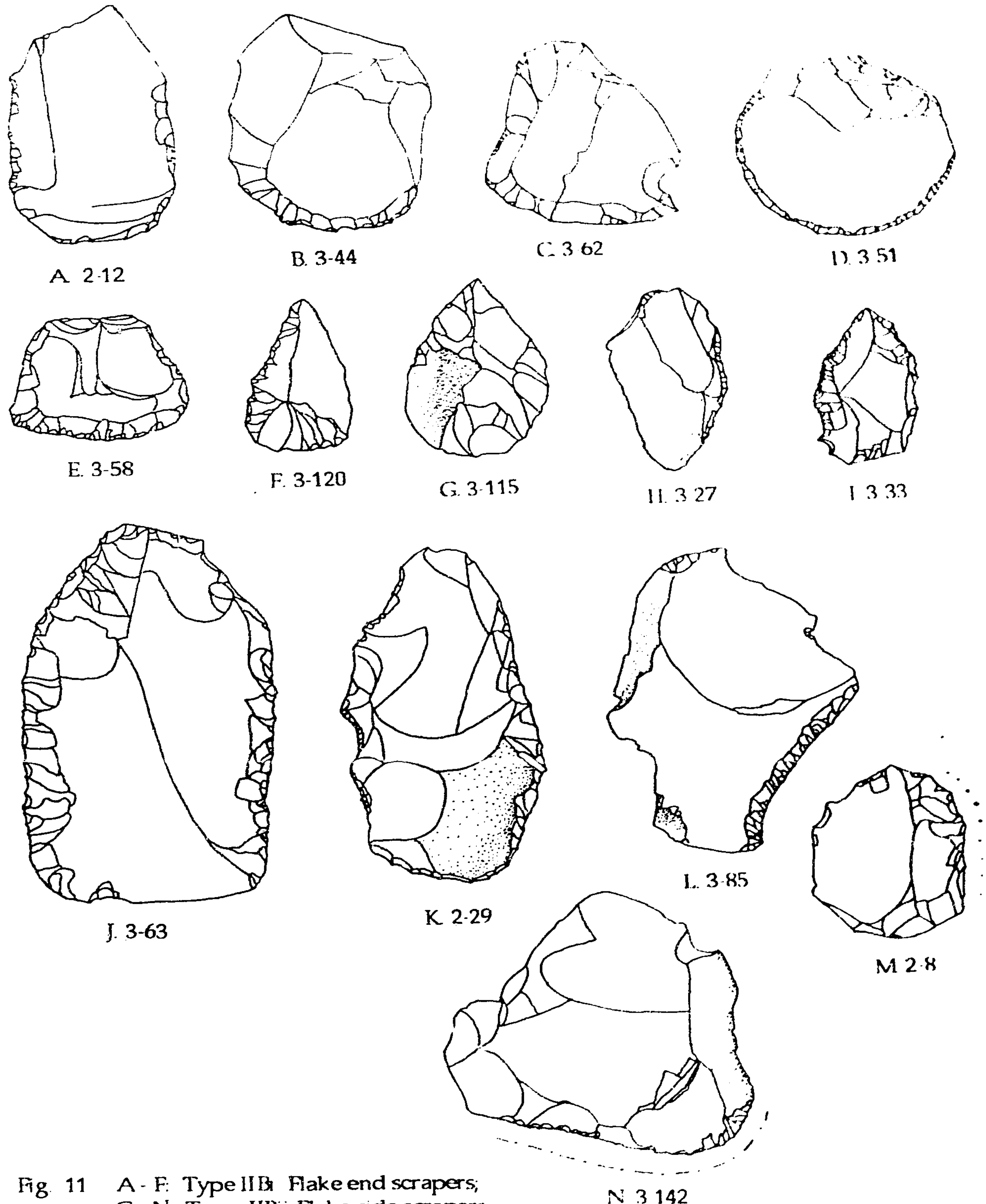

Fig. 11 A - F: Type IIBi Flake end scrapers;
G - N: Type IIBii Flake side scrapers.

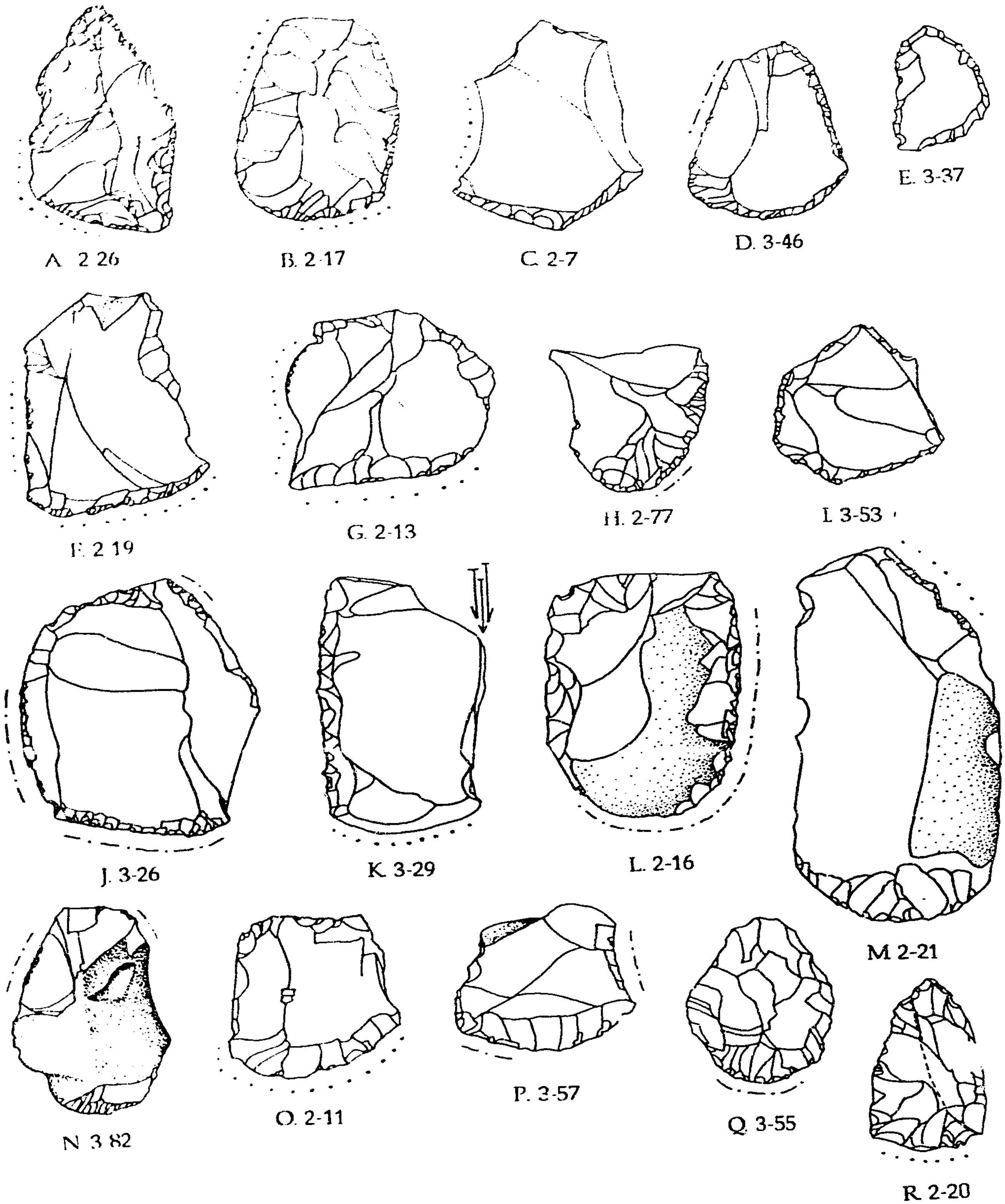

Fig. 12 A - M: Type IIBiii Flake Composite scrapers;
N - R: Type IIBiv Snubnosed scrapers.

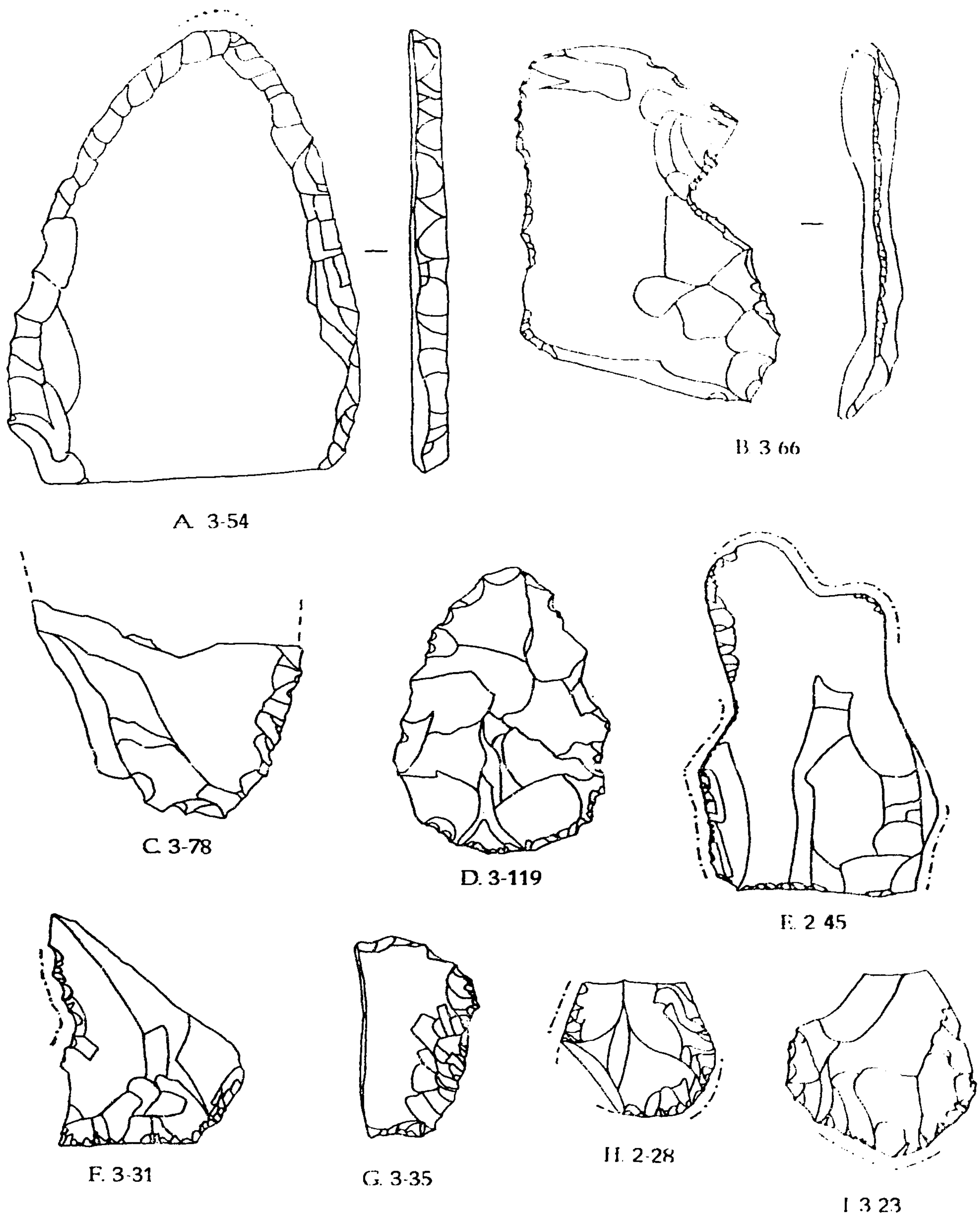

Fig. 13 Irregular retouched flakes (knives).

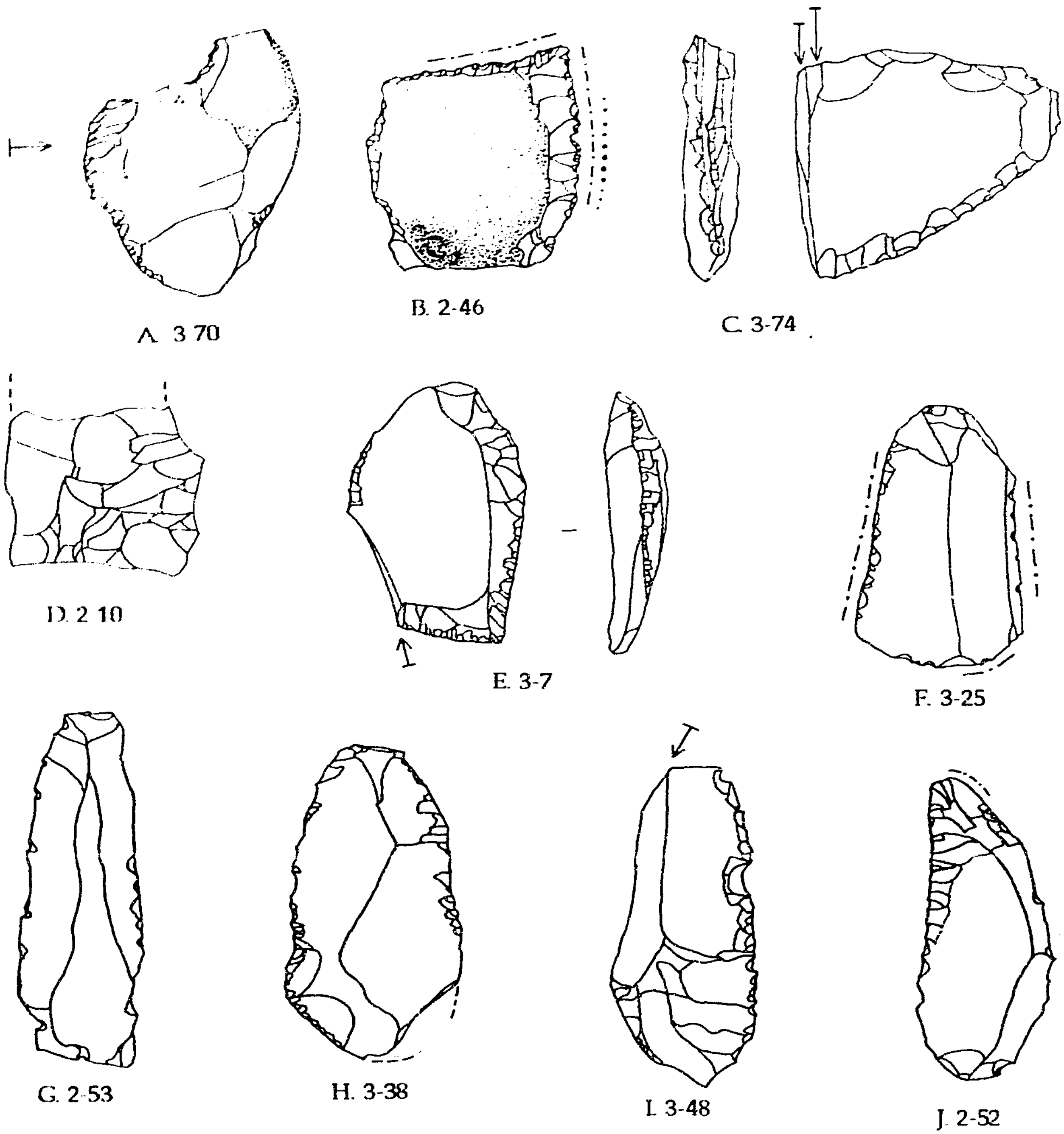

Fig. 14 A - D: Irregular retouched flakes (knives);
E - J: Blades (knives).

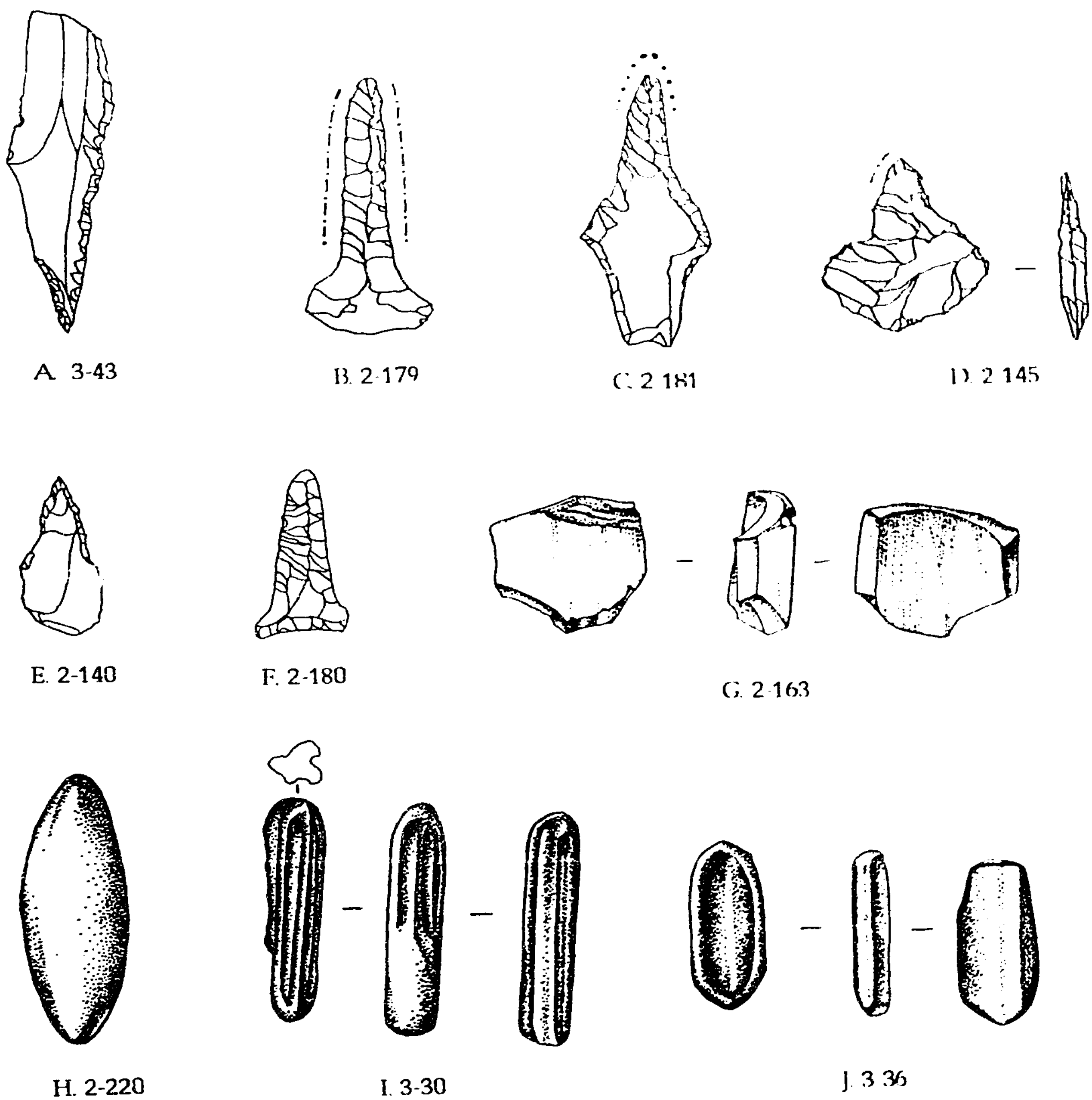

Fig. 15 A - F: Awls; H: Pebble (perhaps gaming piece or ornament),
I & J: Grooved pebbles.

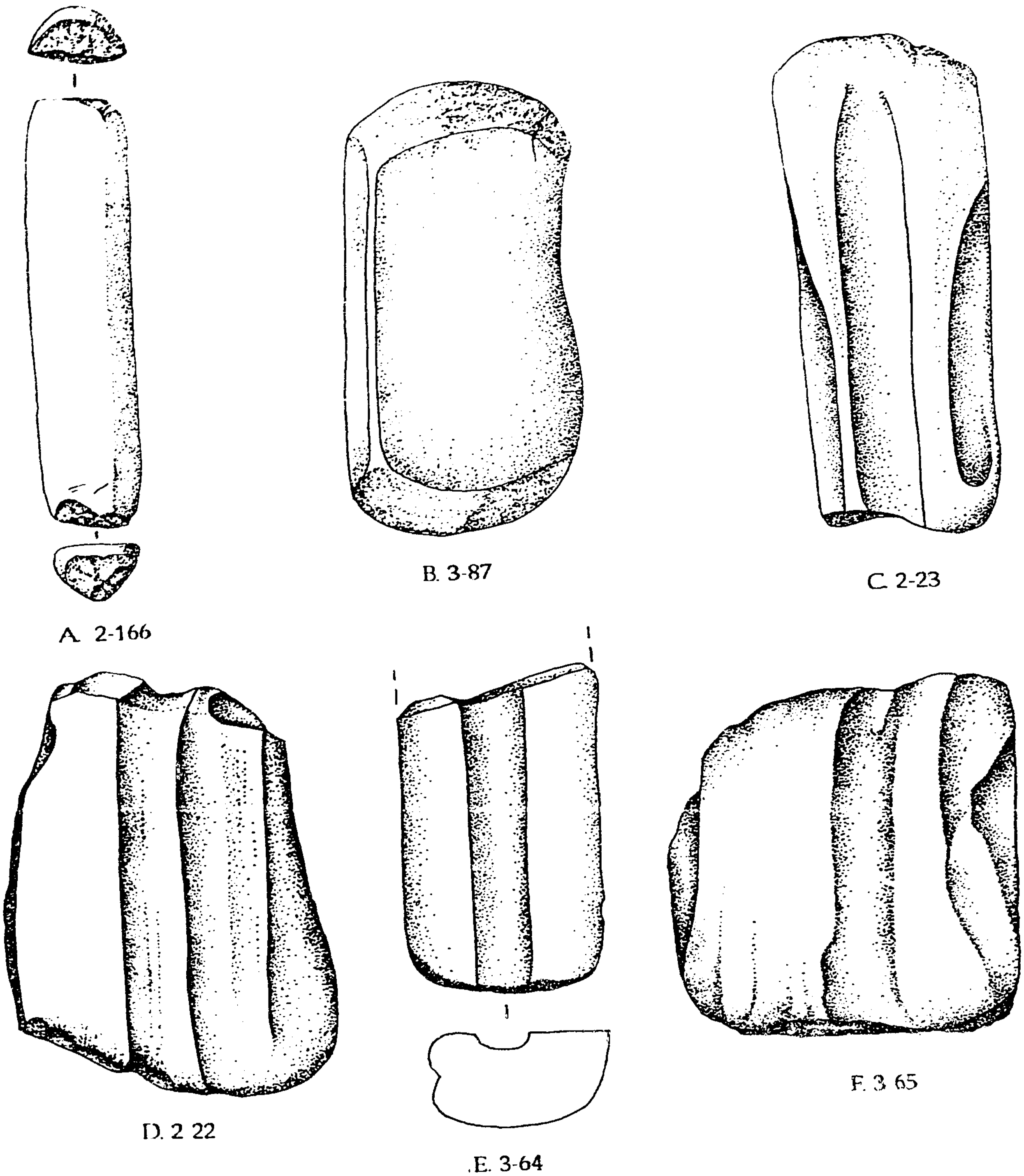

Fig. 16 A & B. Hammerstones; C - F. Shaft straightners/Abraders

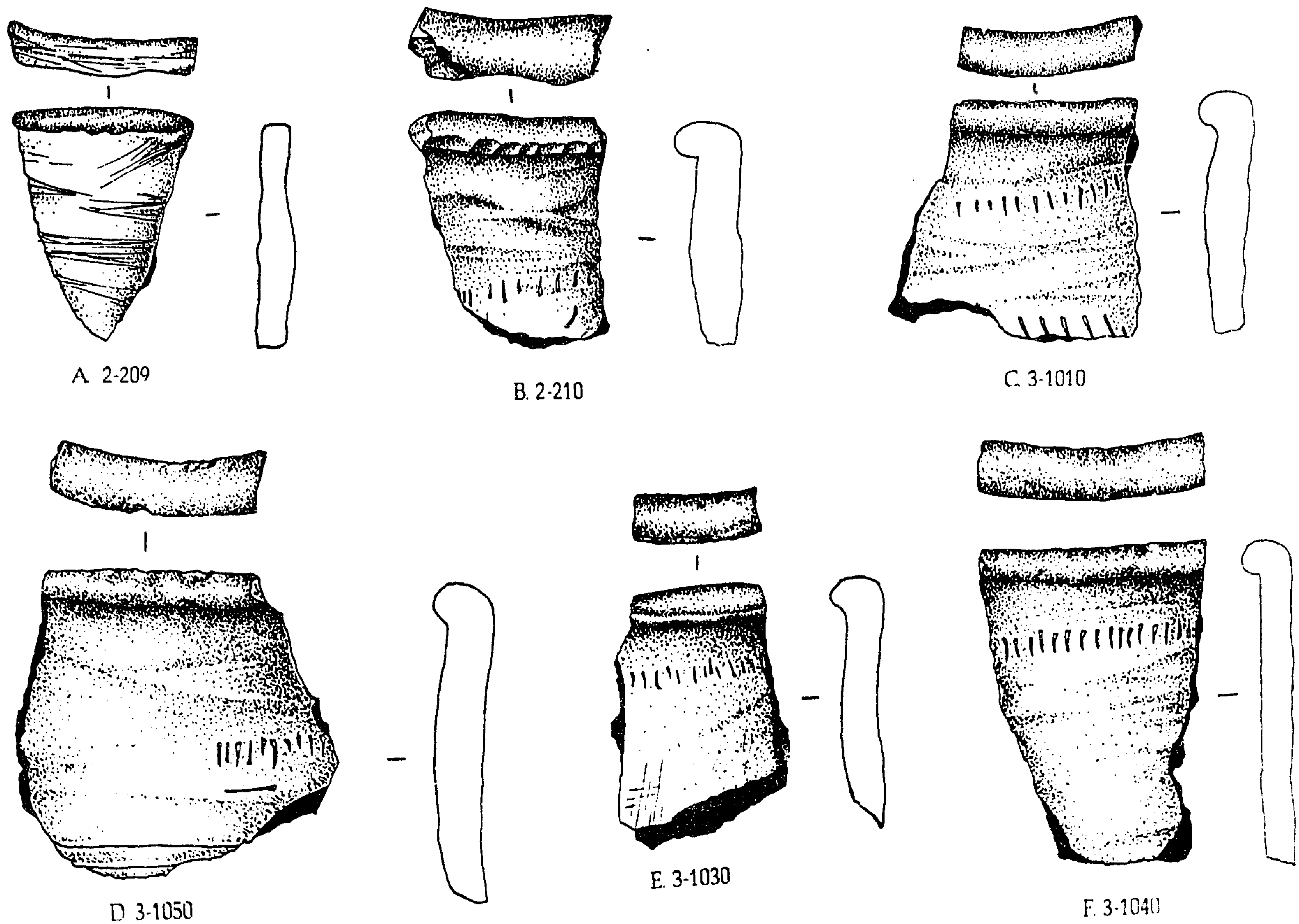

Fig. 17 Great Salt Lake Gray Ware

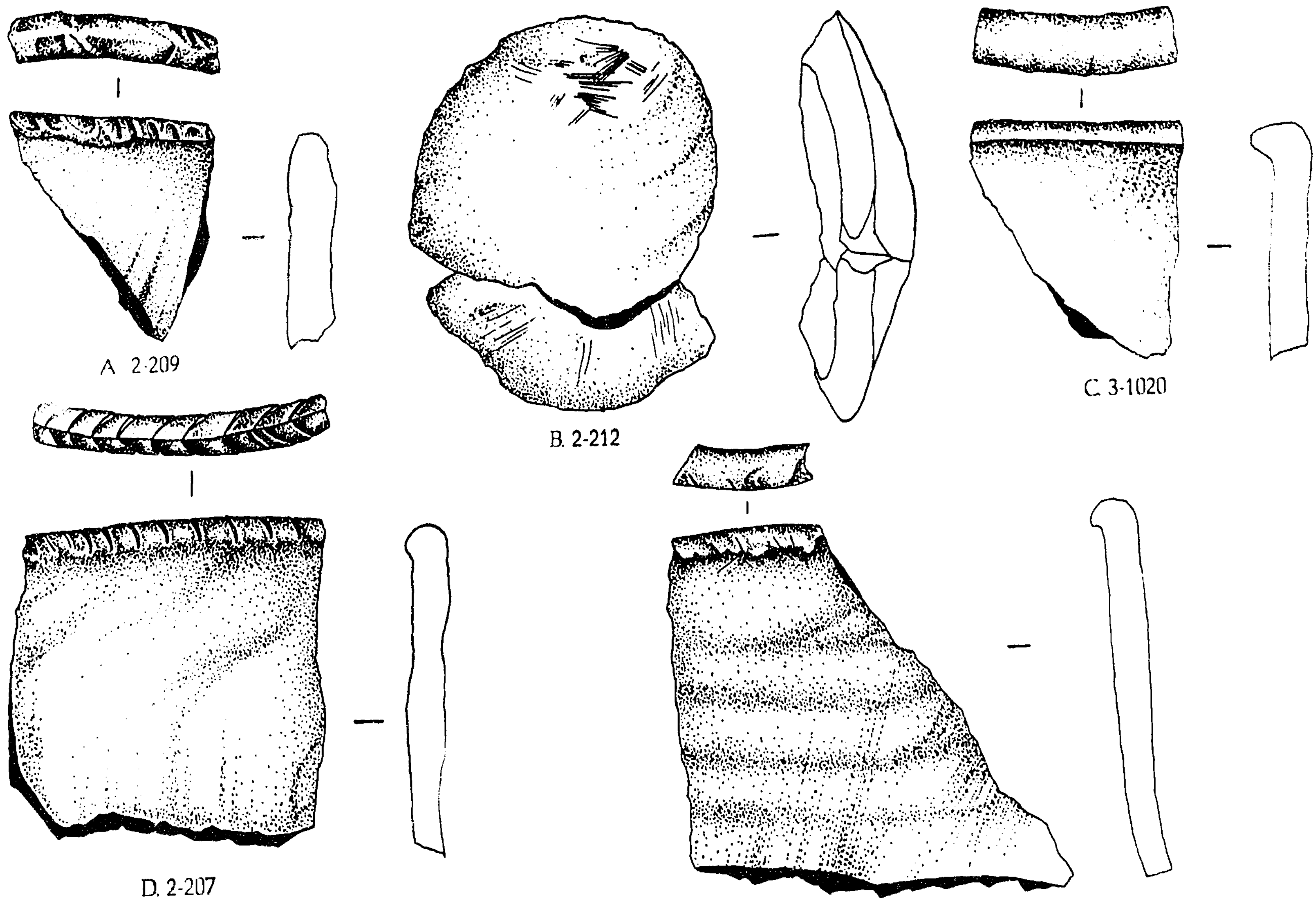

Fig. 18 Great Salt Lake Gray Ware

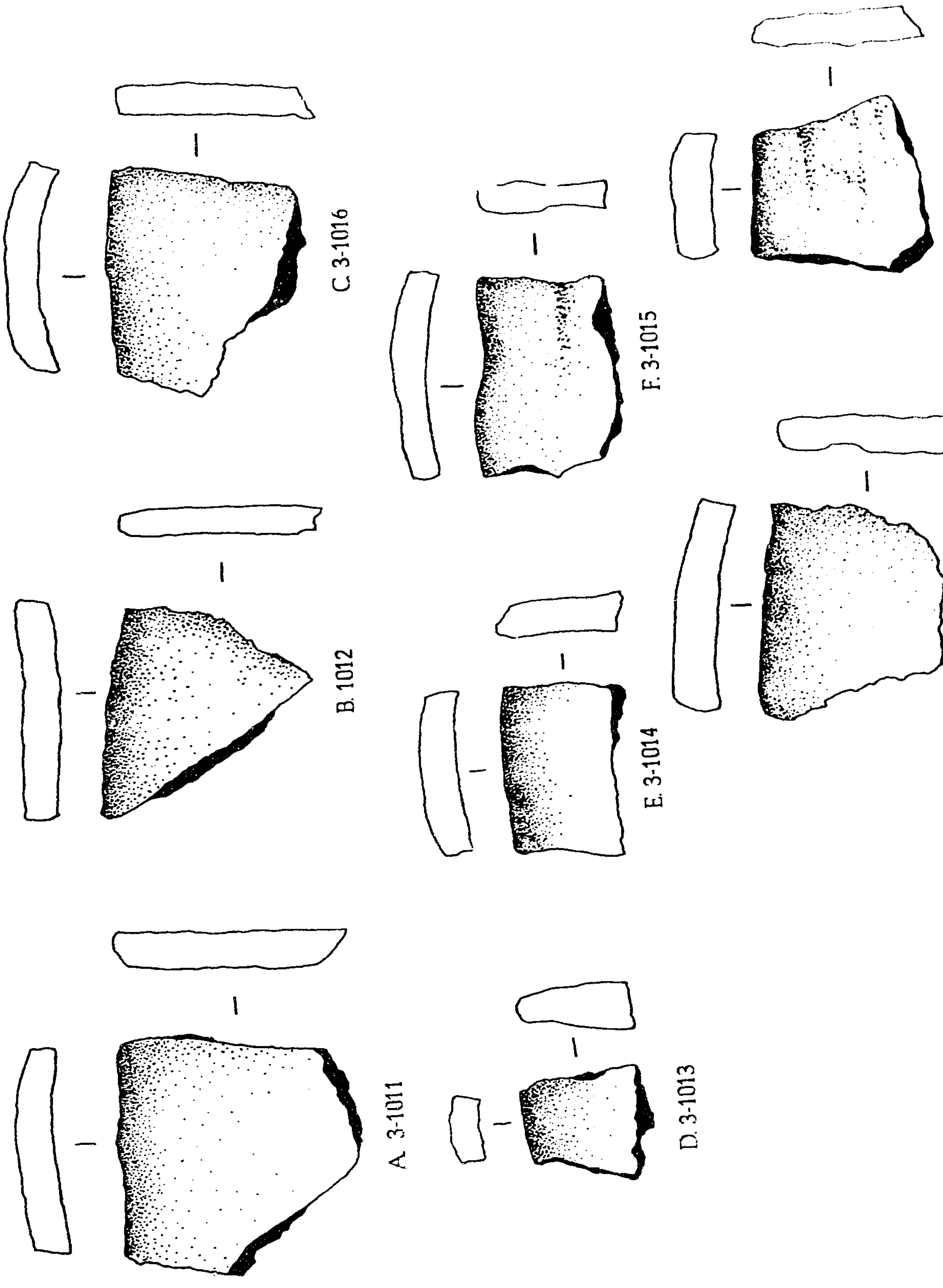

Fig. 19 Shoshone Ware

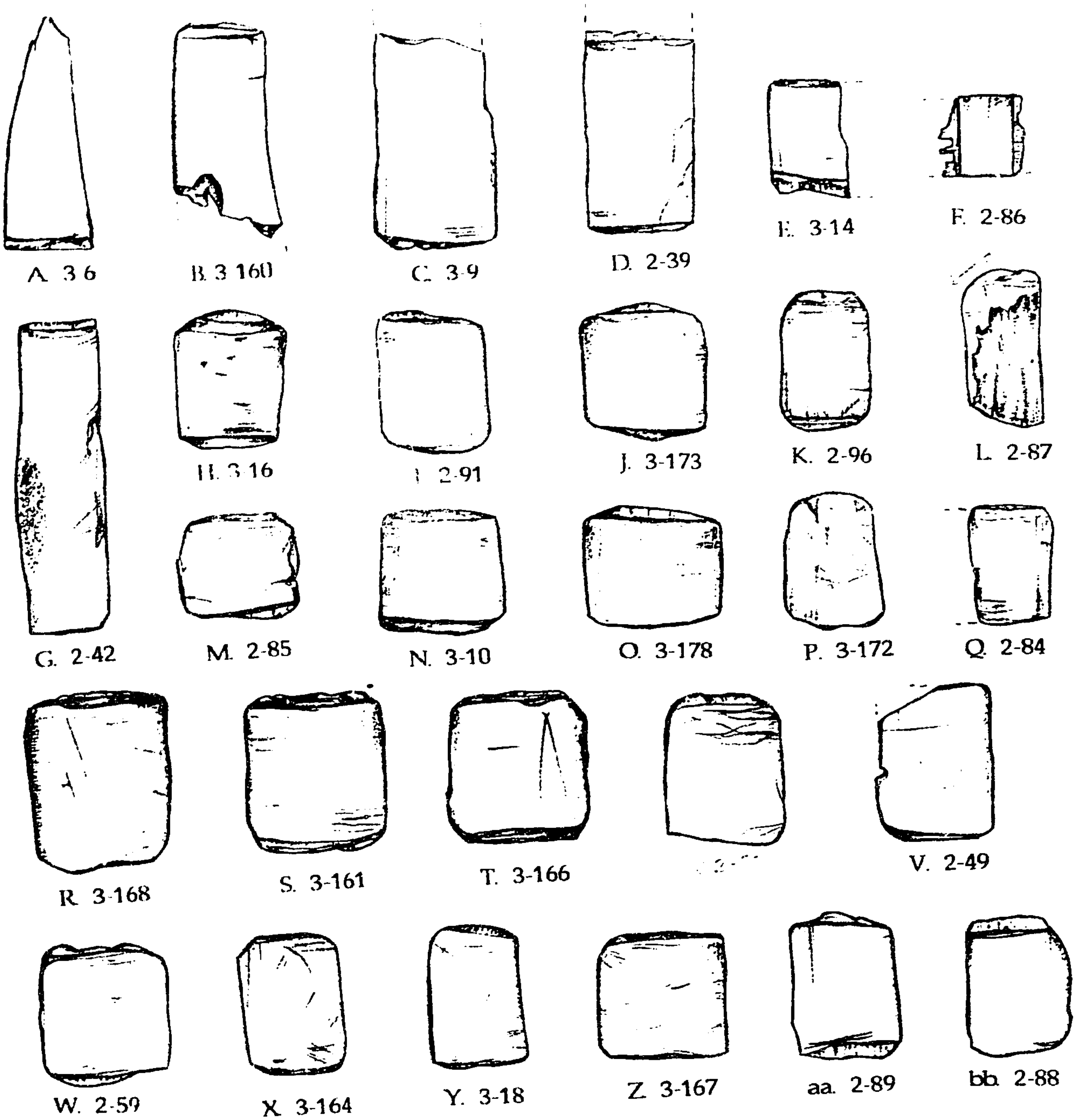

Fig. 20 A - G: Stage 3 Type A, gaming pieces; H - bb: Stage 4 Type A, gaming pieces.

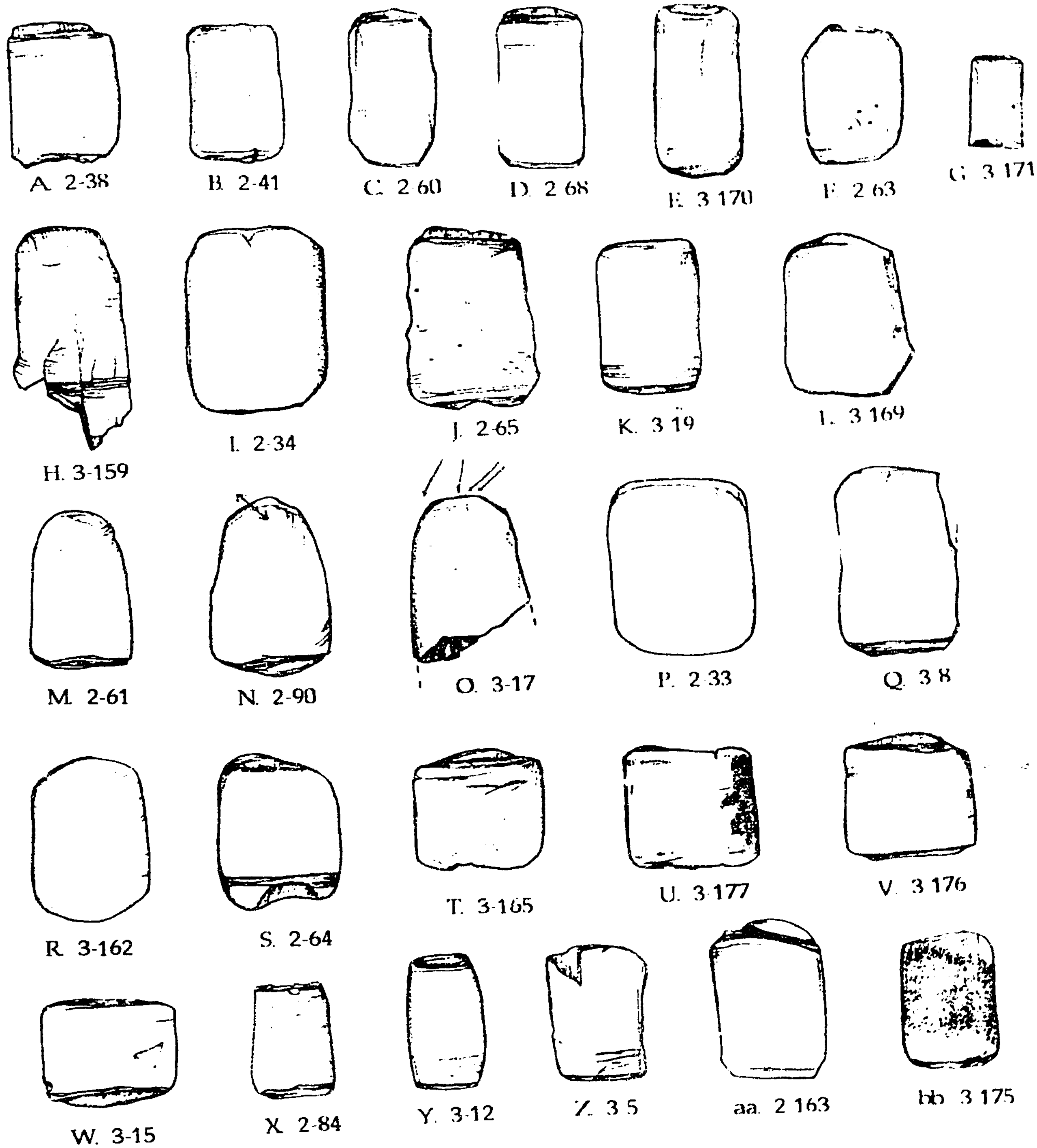

Fig. 21 A - O: Stage 4 Type A, gamng pieces; P - bb: Stage 5 Type A, gaming pieces

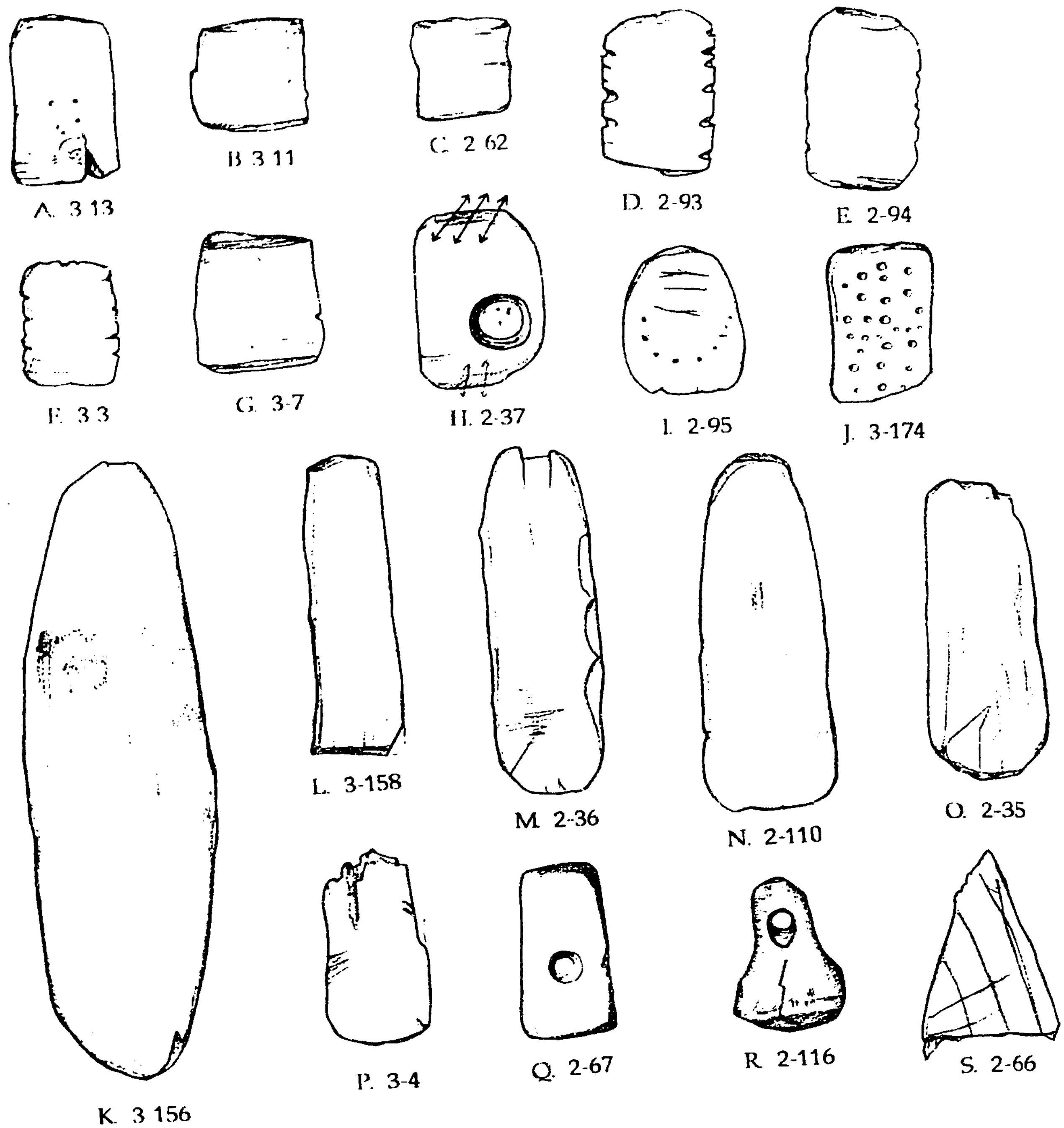

Fig. 22 A - J & Q: Stage 5, Type A gamng pieces; K - P: Type B, gaming pieces;
R: Elk tooth pendant; S: Incised bone fragment.

UNIVERSITY OF ALBERTA

THE FREMONT IN IDAHO

BY

Diane L. Cockle

A Thesis Submitted to the Faculty of Graduate Studies and Research in Partial Fulfillment of the Requirements for the degree of Master of Arts

IN

ANTHROPOLOGY

DEPARTMENT OF ANTHROPOLOGY

EDMONTON, ALBERTA

SPRING 1993

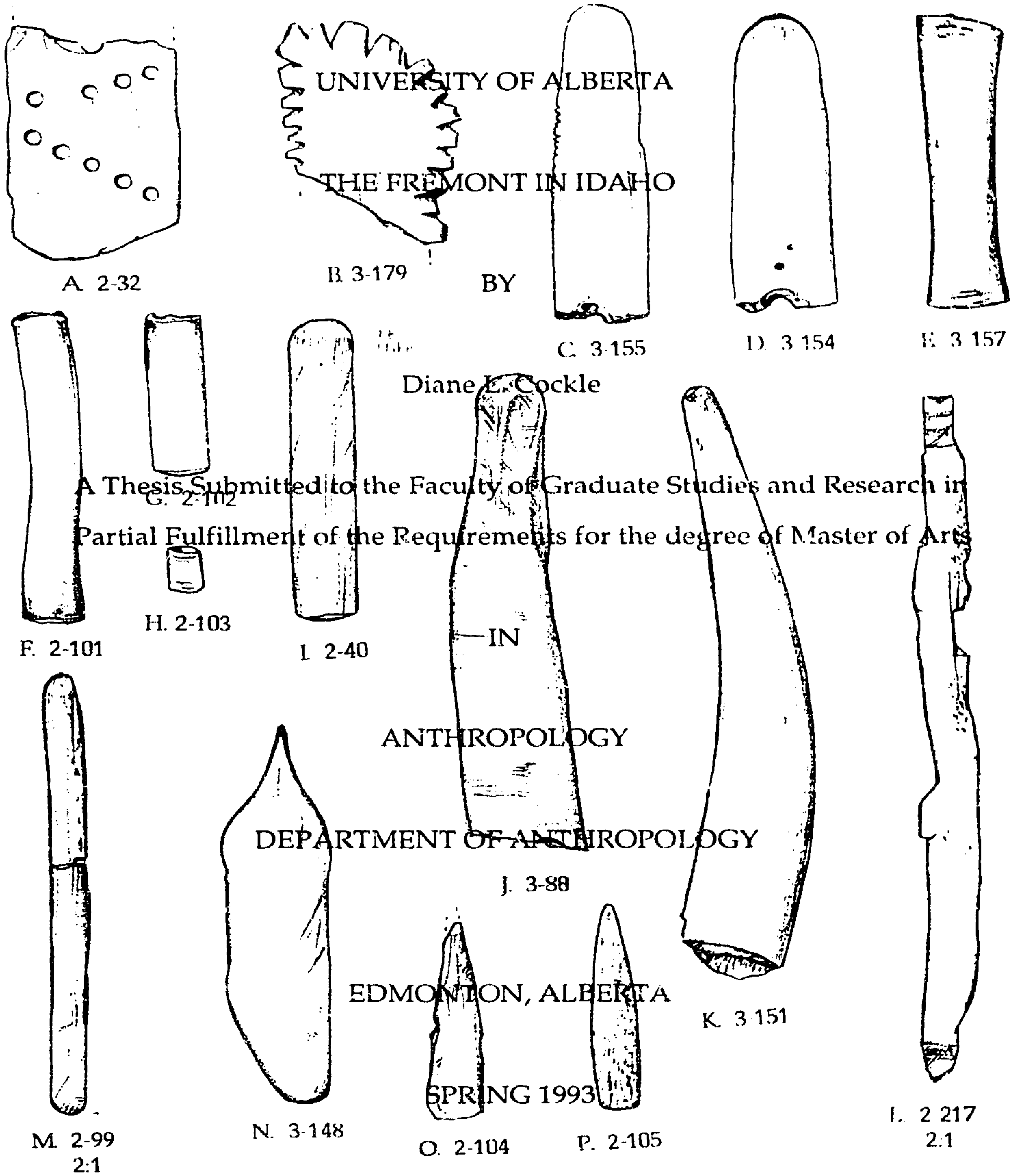

Fig. 23 A - D: Miscellaneous decorated bone; E - H: Bird bone beads; I K & M Flint knapping tools; L: Fire drill bow; N - P: Awls.

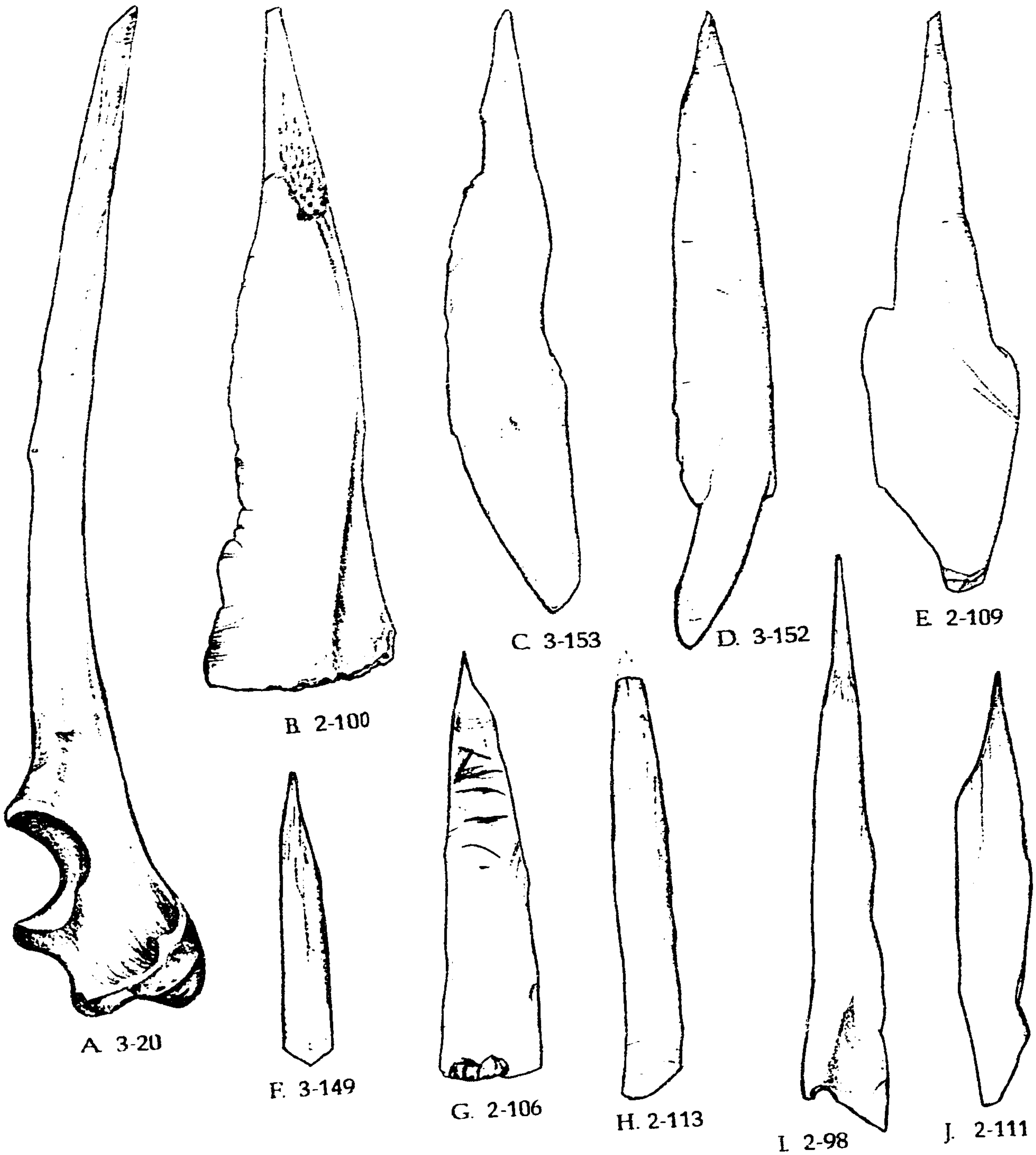

Fig. 24 A - J: Bone Awls.

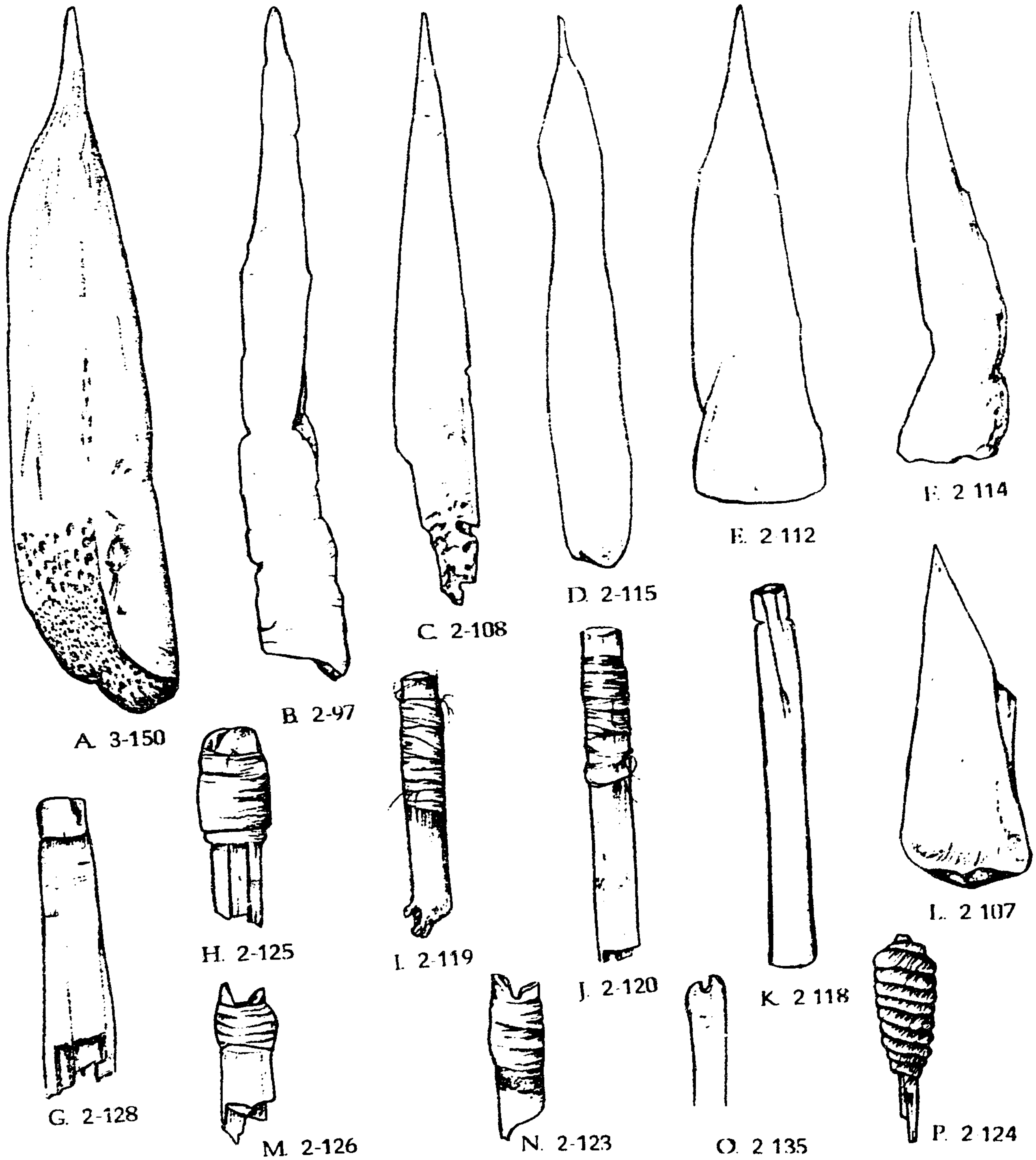

Fig. 25 A - F & I: Bone awls; G, H, M, & N: Nock-ends of mainshaft; I K, O & P: Proximal end of Foreshaft.

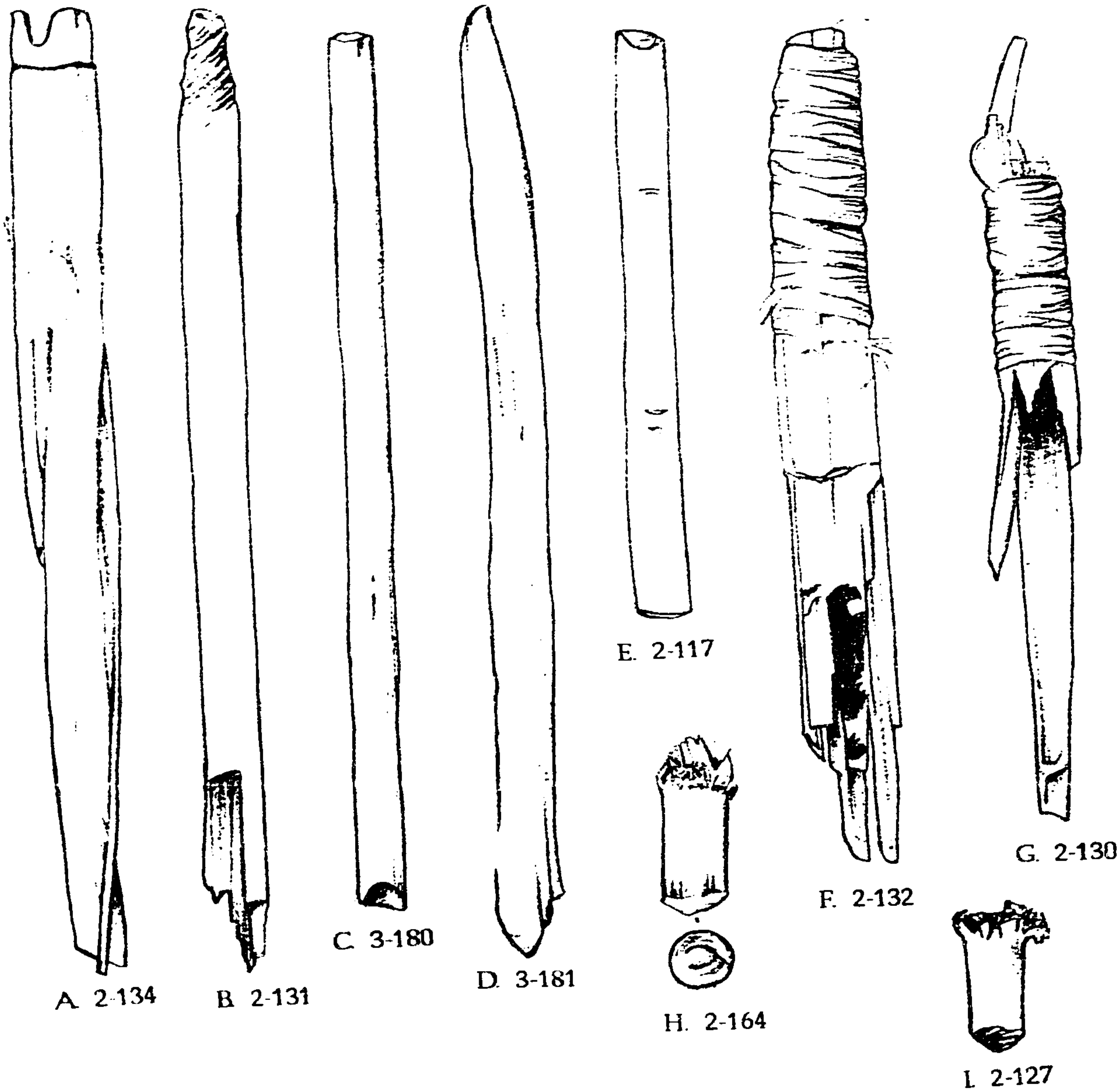

Fig. 26 A: Nock-end of mainshaft; B: Distal end of foreshaft; C - E, H & I: Cutt hardwood fragments; F & G: Proximal end of mainshaft.

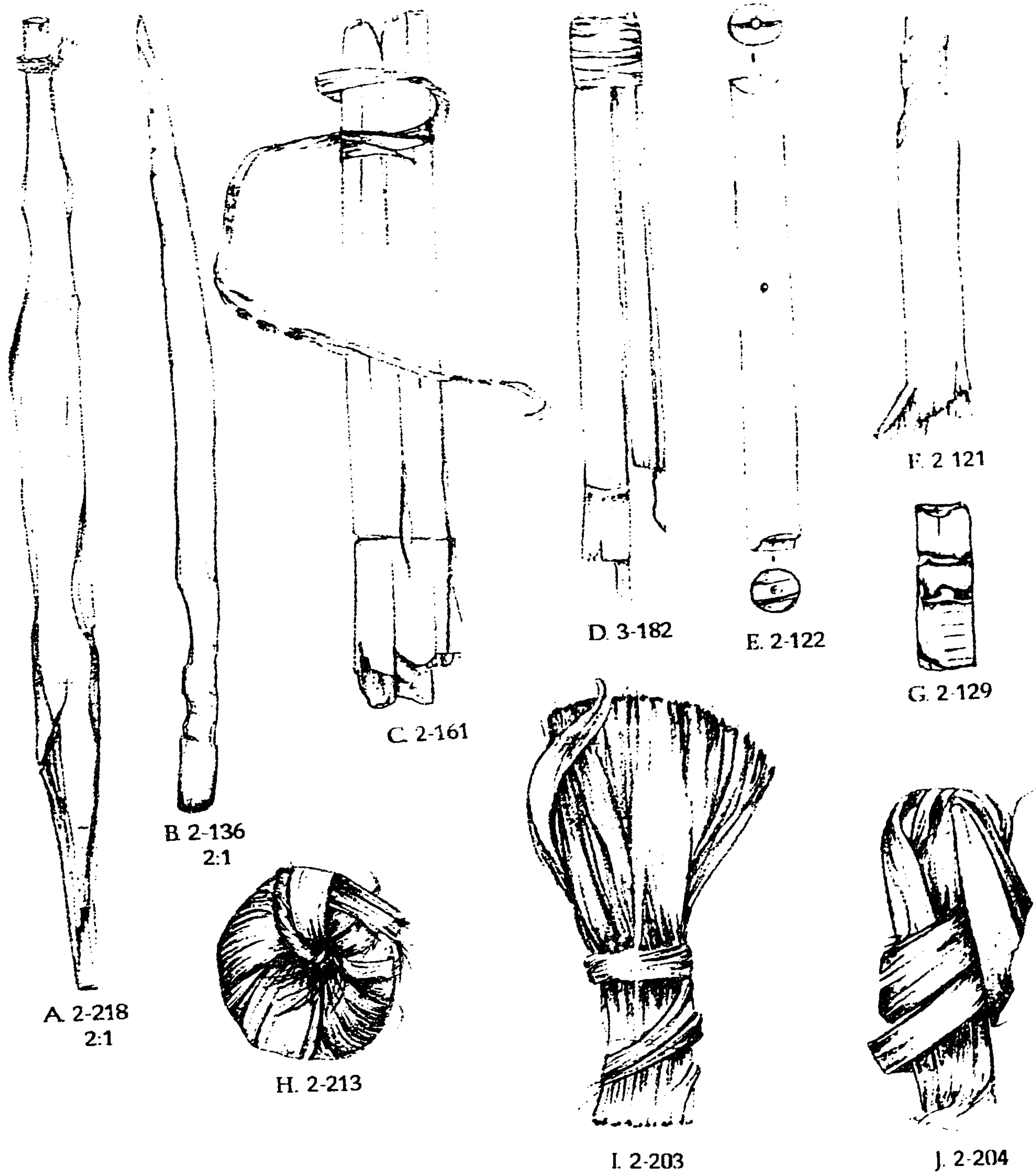

Fig. 27 A & B: Bows; C: Reed matting fragment; D: Proximal end of mainshaft; E: Cut hardwood fragment: F: Distal end of foreshaft; G: Cane gaming piece; H: Rosette; I: Wick; J: folded bark fragment.

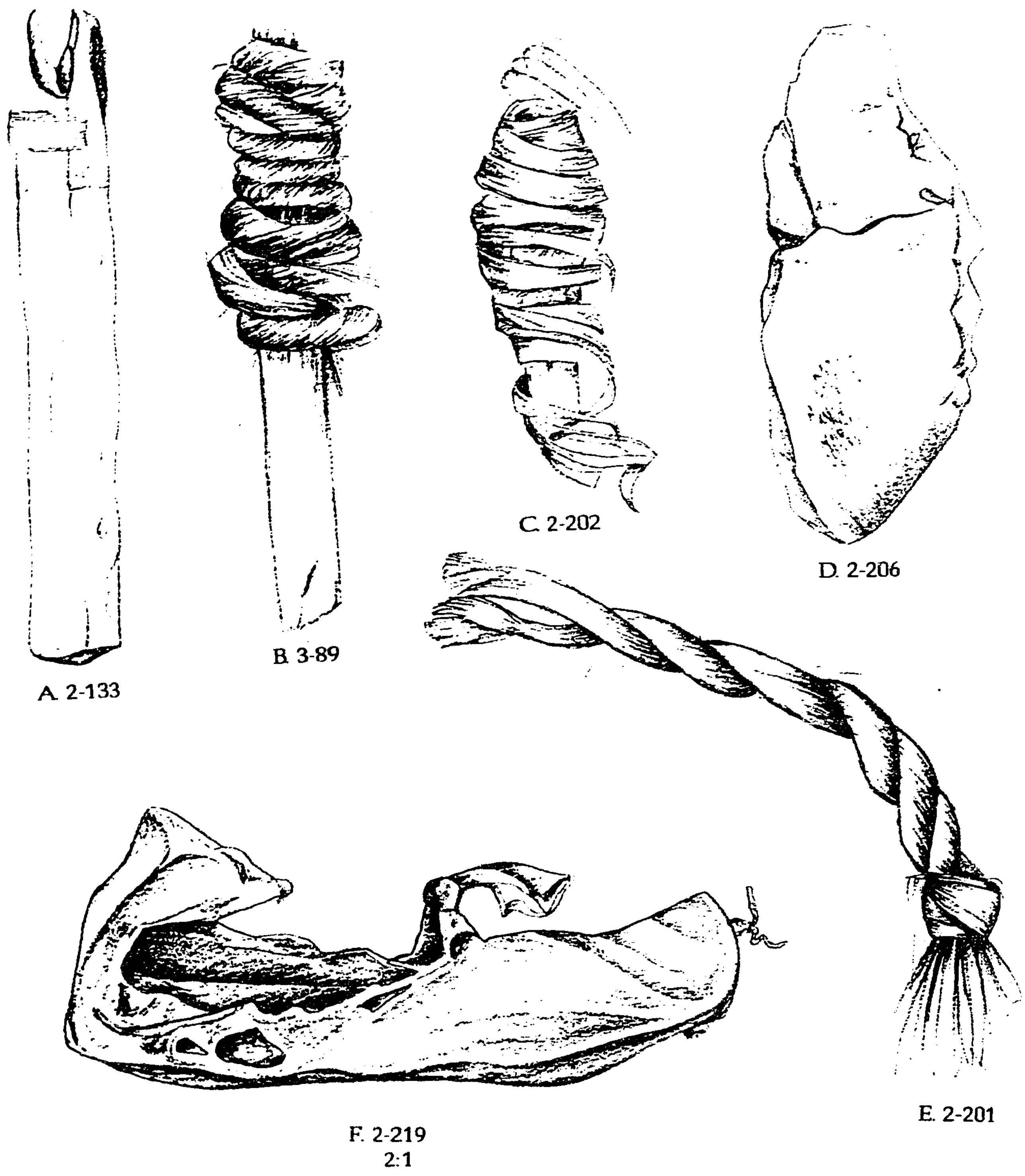

Fig. 28 A: Knife or scraper handle; B: Fire bundle; C: Ceremonial bundle; D: Pouch fragment; E: Cordage (tight Z-twist); F: Hock moccasin.