Final Report on the

Archaeology of the Redfish Overhang Site

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Sawtooth National Forest

Cassia County, Idaho

by

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Idaho State University Museum

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In Fulfillment of the

Memorandum of Understanding
Between the
United States Forest Service
and
Idaho State University Museum
for Archaeological Excavation at Redfish Overhang Site
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I. INTRODUCTION

Redfish Overhang. The Redfish Overhang (Fig. 1) was first officially noted in the 1964 survey report of archaeological reconnaissance in the Sawtooth Mountain area of central Idaho directed by Alfred W. Bowers (1965:14), Professor of Anthropology, University of Idaho, Moscow. The report recommended further investigation of the site at a future date.

Dr. Earl Swanson, Professor of Anthropology, Idaho State University, Pocatello, visited the overhang in 1967 and recommended excavation of the site when funds should become available.

In 1971, the projected plan for a sewer line which would pass directly in front of the overhang, prompted renewed interest in the project. Since the site is located on land under the jurisdiction of the U.S. Forest Service, a grant proposal was submitted by B. Robert Butler, Associate Professor of Anthropology, Idaho State University, to the U.S. Forest Service, requesting that funds be made available for archaeological salvage of the Redfish Overhang. The grant was approved and in July 1971, a test trench was dug at the mouth of the overhang. Sufficient evidence of aboriginal habitation was discovered to encourage complete excavation of the site. I was offered, and accepted, the project as a thesis problem, and acted as crew foreman in the excavation of the site the following summer. Work commenced in June 1972 and lasted for an eight-week period. Five members of the Idaho State University Field School, including myself, worked under Professor Butler's supervision.

Most of the diagnostic material found on the site indicated occupation during the last thousand years; however, a much older period of occupation was suggested by the discovery of a lanceolate point fragment, found in situ. The characteristic outline, flaking, ground edges and basal thinning prompted Butler to identify the point as "Haskett," similar to points with the same characteristics found on the Snake River Plain in south-central Idaho. Later in the excavation, a cache of points and scrapers also excavated in situ, and an additional point fragment, all identified as Haskett material by Butler, and independently by Crabtree (personal communication, 1973), confirmed the Redfish Overhang as an Early Man site.

I will confine my discussion of the Redfish cultural material primarily to the early period of occupation. Joseph Gallagher (1973), a fellow graduate student at Idaho State University, has undertaken an analysis and interpretation of the late prehistoric artifacts. There appears to be a hiatus of soil deposition as well as cultural material at Redfish Overhang from approximately 7,000 years ago until 1,000 years ago.

Haskett Points. Haskett points were first reported from the type station on the Snake River Plain in 1963 (Butler 1964). An organized effort was initiated in 1965 to excavate the sand dune site at Lake Channel, Idaho, located eight miles southwest of the American Falls Reservoir. Butler (1965) directed the excavation, which was carried out by members of the Upper Snake River Prehistoric Society. Two Haskett point fragments were also found on the surface near American Falls Reservoir (Butler 1967:25).

Similar points were reported from Oregon, Nevada, Utah and southeastern California. With the exception of Cougar Mountain Cave (Cowles, 1960), in southcentral Oregon, excavated by an amateur with somewhat suspect techniques, the Haskett points were found in surface collections from pluvial lake terraces and, consequently, not absolutely datable. Although the points appeared to have some antiquity, proof was not established until 1970 when the radiocarbon dates from the Connely Caves in Fort Rock Valley, Oregon, were reported. It was then possible to place the Haskett points in the period 11,000 to 8,000 BP (Bedwell 1970:184).

The Problems

The problems with which this thesis is concerned are as follows:

1. To add to the existing body of descriptive information concerning Haskett sites, specifically, the Redfish Overhang.

2. To compare the Haskett material from Idaho, Oregon, Utah, Nevada and California in order to determine whether these artifacts are similar enough, morphologically, that they may be recognized as products of the same mental template, and, consequently manufactured by people in cultural communication with one another. In addition, relationships with points described as "similar" found on the east side of the Continental Divide needed to be explored so that the areal and temporal distribution of this distinctive point type could be determined.

3. To provide a basis for future research by proposing a hypothesis of seasonal transhumance (Davis 1963:202-212) (use of resources of various ecologic zones on a seasonal basis) involving both the exploitation of big game on the High Lava Plains of Idaho and Oregon and the range areas of the western Great Basin, as well as the hunting of big game during the middle and late summer months in high mountain valleys adjacent to the plains.

Surface finds of Haskett points in the vicinity of ancient playas are usually associated with other types of points: Lake Mohave, Silver Lake, Pinto and others, in addition to various kinds of scrapers, small tools with burin flakes, and crescent-shaped tools. Since these assemblages are generally undated and undatable except in a tenuous association, it has not been possible until now to separate out discrete components for chronological ordering on these multi-component sites.

Haskett points have been included in several designated cultural complexes, most notably Lake Mohave (Campbell et al. 1937), which is seen as part of the San Dieguito Complex (Warren and DeCosta 1964; Warren 1967), the Western Lithic Co-tradition (Davis 1968; Davis et al. 1969) and the Hascomat Complex (Warren and Ranere 1968). Most recently, Bedwell (1970:231) proposed a general term of "Western Pluvial Lakes Tradition" to include all those complexes associated with playas. He hypothesized an extension of this tradition into riverine environments of the Columbia Plateau and the Snake River Plain, as well. The basis of Bedwell's concept lies in an adaptation to a specific kind of environment, i.e., lake, marsh and grassland in what he calls "a general way of life directed toward the complete understanding and exploitation of lake environments" (Bedwell 1970:231).

The Redfish site presented a somewhat different environment for economic exploitation by the makers of the Haskett points than was to be found on the Snake River Plain and the areas of the western Great Basin. A reconstruction of the late Pleistocene environment of the Northern Rocky Mountains is correlated with the environments of other Haskett sites in order to assess the range of resources exploited by early man. The Idaho sites, in addition to the single recent surface find reported from high altitude in northwestern Wyoming, suggest an alternative hypothesis to the Bedwell proposal.

Theoretical Considerations

While the problem of this thesis is concerned with the establishment of a projectile point type in space and time, the sociocultural aspect of man, the hunter, 10,000 years ago cannot be ignored.

The structure of the human cultural systems indicates those refinements of technological efficiency judged by different groups to be most useful in environmental adaptation (Binford 1962, 1965; Jennings 1968). The elements of symbolic abstraction and imagination which characterize the human endeavor, also allow a view of man not limited to evolutionary adaptation alone. Not every ecologic niche is filled, nor do human groups always fill similar niches in exactly the same way. Though often propelled by unrecognized forces, human communities do make choices and work out their destinies in a variety of ways (Flannery 1967:122).

> In any region, a population must first define what elements of its natural environment will constitute resources and then determine their abundance and productivity. These elements only become productive resources when the group has the means - the knowledge, tools and techniques - for using them. In this way, the population itself is defining the carrying capacity of its environment and is ultimately setting the limits on its size (Patterson 1973:40).

In this study, man is seen in the context of his environment and his technological efficiency expressed through certain tools, the Haskett points. Rouse (1970) urges us to go on from the analysis of artifacts to an interpretation of the standards, customs and beliefs of the artisans who made them. Kushner (1970:127) criticizes the processualists such as Binford and Longacre who speak of a "total environment," a biosystem with which the culture is articulated, but which ultimately comes to mean the environment to the exclusion of the biological human organism.

A more acceptable view of man is described by Wilhelm Dilthey (1959; orig. 1883), a German historian-philosopher of the late 19th century, who presents a critique of human reason and philosophy of the sciences which includes the systems, organic and cultural, of which man is a part, in a balanced perspective, neglecting neither the impact of the environment nor the causative agency of the human mind. Dilthey interprets the meaning of man's struggle for survival to be a working out of the human spirit. Dilthey's term, Weltanschauungen, conceives the complete study of man and the interrelatedness of all things in the universe, the inorganic as well as the organic, implying interpretations of reality which express the sense and meaning of the world, so that the experience of life and the view of the world are in inner relation (Makkreel 1968).

The limitations, as well as the potentials of man's biological and psychological nature, are the factors which determine his development. Dilthey sees the basic functional structure of all processes of active and passive adaptation and learning in living systems (from the single celled amoeba to man and the social and cultural systems of man), where the sciences, considered as dynamic learning systems of social action, are paradigms of these systems. Dilthey's theory provides for the possibility of generating new information and consequently new hypotheses which, in turn, promotes new inquiry and syntheses (Krausser 1968).

The Haskett assemblage which constitutes the material remains of a society at a given level of adaptation, bracketed in time and space, has a systematic relationship to the total culture (Streuver 1971:10). It is hoped that the study presented here will provide a workable hypothesis which will generate new information and theories leading to an understanding of the structure and meaning of the cultural pattern.

II. ENVIRONMENTAL BACKGROUND

The following chapter is offered as a general background to the environments in which man found himself 12,000 to 7,000 years ago on the High Lava Plains of Idaho and Oregon, as well as the western Great Basin in parts of western Utah, Nevada and southeastern California where Haskett points have been reported. Recent evidence from the Stanley Basin in the northern Rocky mountains and from high elevation in Yellowstone Park, Wyoming (Butler 1973b) indicate that these people were also highland hunters, exploiting another environment in their seasonal round.

Man, like all living organisms, may be viewed as an open system, in constant interchange with his environment. Since he is a complex organism, his interchange is of necessity more elaborate than that of simpler forms of life. He shares membership in biotic community which, in turn, functions with the non-living environment to form an ecological system (Odum 1963:4).

> Ecology, in its broadest perspective concerns the complete environment which surrounds the living organism and includes all of the vicissitudes, harmful as well as beneficial, in the environment that may confront the organism. Climate and soil constitute the basic environment, because the physical and chemical factors contained therein determine the presence of suitable food, protection and moisture and are essentials for all organisms. Each species has its own set of limiting factors and, according to Liebig's law of the minimum, everything that the organism must use in order to

> live and reproduce must be present and available in at least minimal amounts (Cheatum and Allen 1962:31 in Hester and Schoenwetter 1964).

Climatological data is of primary importance to the archaeologist for interpretation of culture and culture change:

> (It is) . . . important not only for the establishing of the geographical setting, but also because climate can be made to serve as a factor in dating cultural deposits. It is of further importance because of the effects that alternation in climate may have on food supply and in turn on the movements and distribution of human populations (Daugherty 1956:226).

A variety of scientific studies within recent years substantiates the hypothesis of a general warming trend during the deglacial hemicycle. Eustatic fluctuations as reported by Frye and Willman (1960) and Curray (1965) indicate that sea level began to rise about 15,000 years ago in response to the melting of the continental ice mass, and remained fairly constant with only minor fluctuations after 5,000 BP.

Antevs (1948, 1952, 1955) postulated a climatic sequence of three periods following the deglaciation; however, his attempt to tie these periods to a given chronology has been the subject of considerable debate (Jennings 1957; Aschmann 1958; Martin 1963). After the cold wet period which characterized the retreat of the glaciers, Antevs suggests a climatic model as follows: the Anathermal, a period of marked increase in temperature, cooler with more moisture than present, 10,000 to 7,500 BP; the Altithermal, when temperatures rose to a peak, then moderated, 7,500 to 4,500 BP;

and finally, the Medithermal, with moderate temperatures and an increase in moisture, 4,500 BP to present. The three periods are known collectively as the Neothermal.

While these concepts have been generally useful in reconstruction of past environments, it is now recognized that they represent oscillations on a temperature curve rather than definite temporal periods. Such variables as latitude, elevation and topography dictate local climates and, consequently, local ecological conditions.

> In some regions ice formed, advanced as glaciers and later retreated. Elsewhere large inland lakes grew and shrank because of local variations in precipitation, evaporation, and melting rates of nearby glaciers. In other regions variations in temperature and precipitation caused the borders between deserts, grasslands, and forests to fluctuate; and in most nonglaciated areas the relative percentages of certain species of fauna and flora fluctuated in a constant attempt to maintain stable ecosystems (Bryan and Gruhn 1964:314).

Pollen Evidence. Despite the variation in local climatic conditions at a given period of time, correlation of environmental changes in different geographical areas becomes possible when these conditions can be absolutely dated. Pollen core studies have been particularly useful in this respect.

> Palynologists have attempted to define pollen zones so that they record synchronous climatic changes in various regions as manifested by varying components of the different floras of these regions (Morrison *in* Morrison and Wright 1968:51).

> The "relative change" hypothesis assumes that all compositional changes in pollen assemblages recovered from a stratigraphic sequence are related to variations in local abundance of plants in the landscape.

> A common assumption, nurtured by palynologists for about 40 years as evidence of post-glacial climatic change, is the pollen record of fluctuations in predominant tree genera. The assumption that these fluctuations reflect changes in vegetational composition has gained strength from repetition of the pollen sequence of many localities (Leopold in Hester and Schoenwetter 1964:44).

Bright (1966) has drawn conclusions about climatic change in southeastern Idaho from his analysis of pollen cores taken from Swan Lake (4,765 ft. a.s.l.) occupying a shallow depression in the southern part of the outlet of ancient Lake Bonneville. A history of vegetational change for the past 12,090 years indicates that the lower limit of coniferous forests was depressed, in some cases as much as 4,000 feet between 12,090 and 10,800 years ago. A warming transition climate prevailed from 10,800 to 10,300 BP during which time the coniferous forest retreated to higher altitudes and steppe vegetation expanded at lower altitudes. After 10,300 BP the coniferous forest was restricted to higher altitudes in the mountains, and *Artemisia* steppe dominated intermontane valleys and lower foothills. The climate was warmer and drier, similar to the one now.

With some variations, evidence inferring climate change of a similar pattern are reported from the Columbia Plateau (Hansen 1944; 1947 in Butler 1962), eastern Oregon (Hansen 1947), western Washington (Huesser 1960, 1965) and Yellowstone Park (Baker 1970).

Downward displacement of vegetation zones during the late Pleistocene is reported by Mehringer (1967:130-200) from analysis of pollen spectra taken from lake sediments in southern Nevada as well as the Lake Mohave area of southeastern California. Here also, there appears to have been a reduction in the present vegetation zones by 3,300 to 4,000 feet. About 14,000 to 13,000 BP the forest and woodland community changed to one in which juniper, <u>Juniperus communis</u>, dominated. At 12,000 BP a major change in the pollen record occurs with sagebrush-shadscale replacing juniper-sagebrush. A reversal of the warming trend in indicated between 10,500 and 10,000 BP and another between 8,500 and 8,000 BP. With these two exceptions the climate tends to warmer and drier conditions from 12,000 to 7,000 BP.

Despite the general agreement of climatic episodes from pollen analysis mentioned above, the correlation with sequences based on glacial activity in the northern Rocky Mountains is poor.

> Richmond (1965, Table 2) shows the late-glacial stade of the Pinedale glaciation occurring 6,500 to 10,000 years ago, whereas the interpretation here is that the climate was too warm for large glaciers to have advanced during the period 10,000 to 12,000 years ago, but the interpretation of the pollen diagram is more indicative of late glacial conditions. Resolution of these differences will provide interesting research for the future (Bright 1966:26).

<u>Small Mammal Populations</u>. While the pollen spectra from Swan Lake does not record the more subtle influences of the last Pinedale Stade, studies of the fluctuations in the relative percentages of small mammal populations from the Wasden site on the Snake River Plain do demonstrate correlations. Guilday (1969:48), who performed the original analysis of the bone collection states that the extreme

fluctuations of the proportions of material from the pre-Mazama ash layers.

> . . . appear to coincide with involuted layers and ice wedging due to cold weather conditions and may reflect a climatic oscillation.

Butler (1973a:12-13) in a restudy of the bone material, states that the small mammal populations as revealed in the bone count have proven to be synchronous with distinctive sedimentary features of the site:

> (The fluctuations) . . . do appear to be associated with cold pulses of the final stade of Pinedale glaciation but do not appear to have had any lasting effects upon the biota. The cold pulses did not significantly alter the environmental effects of the warming trend . . .
>
> From the time man first entered the Upper Snake Country until 7,000 years ago, the world climate was generally deglacial, but there were cold pulses that resulted in rejuvenation of local alpine glaciers in the Rocky Mountains and the occurrence of ice-wedges at such places as Owl Cave. These cold pulses account for the rather steep valleys between the populations after 7000 years ago, and the relatively low level of population since can be attributed to a reduced effective precipitation rate which had a greater effect on grasses and forbs than on sagebrush as reflected in the ratio of pocket gophers to pygmy rabbits prior to and after 7000 years ago . . . Prior to 7000 years ago, the climate was warming up but still generally cooler than after 7000 years ago and the grass-loving pocket gophers were extremely abundant relative to the sagebrush-loving pygmy rabbits. At 7000 years ago, the warming trend reached a critical point with respect to the grasses and the animals dependent on them. The grasses failed abruptly and there was a considerable reduction in the capacity of the ecosystem to sustain the higher vertebrate forms.

The extremely sensitive indicator of climatic oscillations represented by the small mammal populations can be, in a general way, correlated with the evidence from other sources mentioned here to demonstrate that the arid trend was not continuous and that the period of greater available moisture probably supported grasslands in other areas of this study as well as the Snake River Plain.

Paleosols. Buried soils are also used as indicators of climatic episodes, sometimes on a rather large scale as with "geosols" (Morrison and Wright 1968:84-88) and again, on a limited regional basis, as with paleosols which developed in the Northern Rocky Mountains ca. 10,000 BP (Richmond 1965:226).

> Paleosols are extremely important as they represent a time horizon independent of their host material and topographic position; hence they mark paleo-topographic surfaces. Paleosols are weathering profiles, indicative of paleoclimatic conditions under which they were formed. In some cases they are correlatable over hundreds of miles (Haynes 1962:62).

Paleosols of the period 12,000 to 10,000 BP reported by Morrison (1965, Table 1:268) include not only those from the Rocky Mountain area, but also the Graniteville Soil from the Lake Bonneville vicinity and the Harmon Soil from Lake Lahontan. Flint (1971, Table 20-A:522) lists the Pack Creek Soil from the La Sal Mountains, Utah. Haynes (1965 in Flint 1971, Table 11-A:308) reports a paleosol from Las Vegas, Nevada.

Development of a soil horizon implies a combination of general landsurface stability (minimum erosion and deposition) and a more accelerated rate of chemical weathering than normal (Morrison 1968:57). The trend toward a climate conducive to soil genesis was apparently taking place in western America just before 10,000 BP.

Pluvial Lakes. One last Pleistocene phenomenon used as an indicator of climate change remains to be mentioned. This is the wide belt of pluvial lakes which extended from the Great Plains to the westernmost part of the Basin and Range Province. In this region, over 141 closed basins, mostly of tectonic origin, contained fluctuating stands of water which can be correlated with glacial oscillations. Lake Bonnevile in Utah and Lake Lahontan in northern Nevada were two of the largest of these lakes. Beach lines and terraces record various levels of the lakes, subject not only to changes in amounts of precipitation, but also to rates of evaporation (Morrison and Wright 1968:38; Flint 1971:444).

The term "pluvial" does not necessarily mean an increase in rainfall, but rather, a greater economy in the hydrologic cycle:

> Reduced evaporation from free water surfaces and reduced transpiration from plants such as might result from lowered temperatures, particularly in summer, would be effective in producing higher lake levels. A general increase in vegetative cover and a more sustained flow of streams and springs would also take place. To interpret the evidence so as to infer that these time intervals were "pluvial" implies too much: it is sufficient to say that they were relatively wetter (Bryan in Haury 1950:93).

The beach strands and terraces of the pluvial lakes which have been dated can be used to interpret the age of associated artifacts by archaeologists. Such dating has proved to be rather inconclusive, however, since there has been some controversy over the dating of the pluvial lake stands. As this information becomes more refined by correlation with lake sediment cores, etc., the dating of the artifacts may become also more absolute. It should be remembered that Haskett points have been found in this association.

Oscillations of Lake Bonneville have been dated by Morrison (1966:84-101). At approximately 18,000 and 14,000 BP the lake rose to high levels. Another high level, but considerably below the other two, occurred about 10,000 years ago.

Fluctuations for Lake Lahontan followed the same fluctuation pattern as Lake Bonneville. Major recession of this lake began about 11,000 BP with a reversal culminating in a high lake level ca. 9,550 BP, then a last recession (Broeker and Kaufman 1965).

Warren and Ore (1971:2561) report a lacustral interval for Lake Mohave in southeastern California at 14,500 BP with low water at 14,000 BP, followed by a second lacustral 13,750 to 12,000 BP and a low between 12,450 to 11,000 BP.

> Rapid rise of the Searles Lake level to overflowing and emerging springs at Tule Springs around 11,000 BP correlate with the beginning of the third high water at Lake Mojave. Seven shell and four tufa dates indicate a lacustral ending shortly before 9,000 BP.

A last lacustral is indicated between 8,350 and 7,500 BP (Warren and Ore 1971:2561).

<u>Summary</u>. Cumulative evidence, then, indicates a dramatic climate and corresponding environmental change at ca. 12,000 BP. The following period of the Anathermal is characterized by a fluctuating sequence of warm-dry, cooler-

moist periods with transitional climates in between. As the warming trend took place, coniferous forests moved to higher elevations, and a broad grassland-steppe became predominant. As the most sensitive of the ecotones involved in the climatic fluctuations, the steppe narrowed and expanded in response to the climate as expressed in temperature and precipitation.

The pollen studies mentioned above show a continuing grassland environment throughout the Anathermal period in the western Great Basin and the High Lava Plains of Oregon and Idaho. There were, no doubt, many local variations of climate and environment affected by latitude, elevation and topography. On the basis of the various climatic studies it is suggested that the general environment for these areas was more homogeneous between 12,000 and 9,000 to 8,000 BP than since that time and that the grassland steppe varied primarily in its carrying capacity. It is suggested that herds of big game such as bison, horse, camel and antelope were supported by the grasslands, and that for some of the people occupying these areas, the hunting of big game was their most important subsistence activity.

Some groups of people obviously adapted to other economic resources within the environment. Lacustrine resources were obviously exploited at Lovelock Cave (Ambro 1967; Shutler 1968). As the climate became drier and warmer, a wider variety of resources would have to be utilized. As the carrying capacity of the grasslands gradually became less after 9,000 BP, especially in the southern areas, alternative economic patterns to big game hunting would have taken on more importance. Farther north, on the Snake River Plain, big game hunting apparently continued for a longer period of time.

The climatic change which encouraged the expansion of the grasslands at lower elevations was responsible for the opening of the high mountain valleys. As the glacial ice retreated, vegetation flourished. In time, the natural parklands expanded here, also, and game came on a seasonal basis to graze. The men who hunted on the plains came seasonally to hunt in the highlands where elk, deer and mountain sheep were abundant.

III. REDFISH OVERHAND

Location and Setting

Redfish Overhang (6,500 ft. a.s.l.) (Fig. 2b) is a small archaeological site located on a remnant of terminal moraine at the entrance to a six-mile-long glacial valley extending westward into the recesses of the Sawtooth Mountain range of central Idaho (Fig. 2a). This area, with 52 peaks over 10,000 feet in elevation, lies within the most southern portion of the Northern Rocky Mountain physiographic province (Fenneman 1931) (Fig. 3).

Glaciers of Pleistocene age formed in the high mountain cirques and gradually descended the lower slopes to carve and scour long trough-shaped valleys and deposit massive lateral and terminal moraines. Numerous small mountain lakes, dammed by the moraines, now lie in the secluded valleys. The largest of these, Redfish Lake, five miles long and over 125 feet deep (Dane Williams personal communication, 1973), is located two miles southwest of the overhang. Redfish Lake Creek flows from the lake's northeast end, meandering toward Little Redfish Lake (Fig. 7a), a shallow, round, mud-bottomed pond, one-eight mile from the site. From there the creek continues its meander until it decends suddenly in white water rapids to confluence with the mainstream of the Salmon River, a half mile to the east

(Fig. 4).

The two huge boulders which form the overhang emerge from the moraine slope 300 yards north of the creek on the opposite side of the intervening floodplain. The overhang is located on the middle third of the slope (Fig. 5), commanding a view of the surrounding area and of animals attracted to graze along the creek. Behind the overhang the moraine rises steeply 20 feet to a broad shoulder, which in turn coalesces with the piedmont moraines bordering the floodplain of the Salmon River in a north-south direction.

Thirty miles to the south, the headwaters of the Salmon River rise in the Boulder Mountains, flowing northwest along the axis of the Sawtooth Valley. Moraines flank the abrupt uplift of the craggy Sawtooth range on the west. Alluvial fans mark the debouching streams from the Boulder Mountains, the snow-capped White Cloud peaks, and the more subdued Salmon River Mountain range which walls the valley on the east.

From the Redfish Lake Creek confluence, the river continues north, flowing along the western base of the mountains for several miles until it swings in an arc, skirting a wide glacial outwash fan south of the town of Stanley, (pop. 47), then proceeds in an easterly direction through a narrow gorge toward Challis, Idaho.

The Stanley Basin of which the Redfish Valley is a part, is a 46 mile long depression comprised of two sections: Stanley Valley extending 9 miles north of the arc of the

Salmon River, and the 37 mile long Sawtooth Valley to the south. The Basin is generally broad and open with extensive rangelands in the Sawtooth Valley and lush meadows along the streams in the northern section. The eight thousand foot high Galena Summit must be crossed to leave the Stanley Basin at its southern end. The Wood River drains the valley south of Galena and flows into the Snake River Plain downstream from Twin Falls, Idaho. Just west of the Wood River where it enters the Snake River Plain lies the Camas Prairie, traditionally a gathering place for aboriginal groups to dig the fleshy bulbs of the camas plant on their seasonal round (Steward 1938:167).

The rugged wilderness terrain surrounding the Stanley Basin on all sides provides a somewhat formidable barrier. The western slopes of the Sawtooth Range are incised by streams feeding the south fork of the Payette River and the three forks of the Boise River. These drainage systems would have been the principal travel routes for small hunting groups from the west. Access from the north is less difficult through the Marsh Creek meadowlands, but the Salmon River country beyond is equally mountainous.

The Salmon River gorge lies to the east presenting an obstacle to travel until historic times when a roadway was cut through. There are reports, however, of an old Indian trail from the Lemhi region passing up the Salmon River to Stanley Basin, thence over the divide to the headwaters of the South Fork of the Payette, and then southwest to the Boise watershed. Later used by miners from Idaho City, it is said to have been called the "Lemhi Trail" (Goodwin and Hussey 1965).

The Site. The two large granite boulders, forming the Redfish Overhang, combine to make an effective rock-shelter (Fig. 6). The more massive of the two, 9.75 m long, 3.6 m wide, 6.10 m high, is situated on the east side of the site on an east-west axis. The second boulder, 6.10 m in diameter, shaped like a mushroom cap, lies aslant the main block at a 45^{o} angle, roofing the chamber below. The oval interior, $9m^2$ in area, is divided almost exactly in half by a third, smaller boulder, partially submerged in the dirt fill, which projects into the foreground of the site.

The mouth of the overhang faces southeast toward the floodplain of Redfish Lake Creek. At the back of the chamber, on the northeast corner is a second smaller triangular opening which was accessible by a natural ramp of boulders and earth. A well-sheltered open area, 1x3 m leads to a small cave formed by a vertical fracture on the north side of the main block. This cave, 1.5x3 m, is so situated that it provides a comfortable shelter. An opening on the east end, somewhat like a narrow window, 1.5 m above the level of the front terrace, would provide an excellent game observation station. This cave may prove fruitful for exploration, but, so far, has not been excavated.

The boulders of the overhang are located 2 m above the level of the floodplain floor, connected by a sloping terrace. Origin of the huge boulders is open to speculation. One theory proposes that the boulders were glacially rafted, perhaps as a single unit, since fractured by glacial action, concussion or weathering processes. Dr. Wakefield Dort, Professor of Geology at the University of Kansas, Lawrence, and a specialist in glacial phenomena, examined the overhang and moraine. He suggests that the boulders may be a spur or ruptured fragment of bedrock material, moved only minimally by glacial action. Dort justifies the concept by the extreme size and angularity of the boulders.

Before excavation the dirt fill on the chamber floor east of the dividing block sloped at a 10° angle from the back wall to the front. The walls are seamed, mottled pink and tan in color, and rough from exfoliation, with vertical stains from smoke and seeping water. The roof is concave on the underside and breaks about two-thirds of the way back, slanting more steeply to form the back wall of the chamber. The west half of the interior was filled almost to the roof before excavation. Only by climbing over the top of the center boulder and sliding in on top of the fill could one reach this elevated floor.

The overhang provides ample protection from the elements. The rising sun streams in from the east during the summer, warming the interior and lighting the back wall. It remains fairly cool during the heat of the day and offers shelter from the cold night wind. The back opening allows a good draft for fires, thus accounting for the numerous evidences of hearths and firepits on the east side of the chamber. I have observed that even in the late autumn, the sun at a low arc, warms the interior well into the late afternoon. The same would be true for the spring season as well.

Before excavation, an 80 cm high wall of small boulders filled part of the back entrance on top of the earth ramp. This appeared to be of recent construction since modern debris was found beneath it. The structure served to keep the moraine sands from washing in and provided additional protection from the wind.

A mature lodgepole pine, Pinus contorta, shelters the overhang on the west. Aspen, Populus tremuloides, grow in the protected open space to the rear of the boulders, and their long roots protrude into the sediments of the overhang interior. Young aspen crowd the east end of the moraine on the south slope. A sparse growth of stunted sagebrush, Artemisia, and grasses, Festuca idahoensis, Stipa letterman, cover the exposed moraine, although on top, in the "knob and sink" terrain, stands of lodgepole pine are to be found in the shallow depressions.

The plain is a generally open area with large glacially transported boulders protruding from the soil. Scattered mature lodgepole pine and a thin covering of grasses are found here. The ground cover was all but destroyed by herds of grazing sheep as they passed over this section on the way to summer pastures north of Stanley in past years.

A small island isolated in Redfish Lake Creek displays thick grasses, shrubs and trees, probably a more accurate example of flora supported by the floodplain in times past.

The area has been a prime game habitat. Elk, deer, mountain sheep and antelope were abundant in early historic times. Anadramous fish spawn in the river, streams and lakes, and several varieties of trout are caught in season.

<u>Geology</u>. Oldest among the rock formations of the Sawtooth rock formations are the highly metamorphosed sediments of Precambrian age on or near Thompson peak, due west of the Redfish site. South of the Sawtooths is the Wood River formation of limestone and quartzite, folded and faulted in association with the rising Idaho batholith of early Cretaceous age, one of the most significant formations in Idaho, covering an area estimated at 20,000 square miles. (Gale and Plumb 1964:4-6).

In the period 40 to 60 million years ago (Eocene to Oligocene) the Sawtooth Batholith intruded into the older Idaho Batholith. The former is composed of granitic rocks, pink in color, and easily discernible in contrast to the white Idaho batholith formation on mountain escarpments. East of the basin lie highly deformed sedimentary rocks underlaid by the widespread Challis volcanics, extruded during the same period as the Sawtooth Batholith.

Stanley Basin is the result of down-dropping as tectonic forces uplifted the Sawtooth range at a high angle fault. Upper peaks of the Sawtooth range present a matterhorn profile carved by intense glaciation. Typical aretes, cols and cirques have sharpened the ridges into knife-edge outline, giving the name "Sawtooth" to the mountain range (Gale and Plumb 1964:8-10).

The Montezuma fault marks the western edge of the range, and other lesser faults have also been identified. Numerous hot springs throughout the entire area attest to the complex faulted structure. These springs are attractive to animal and man alike. At least one spring, located on Valley Creek near the town of Stanley, gives evidence of aboriginal habitation (Bowers 1964:11). Others may do so as well.

Climate. Climate in the Stanley Basin and related areas is controlled primarily by the seasonal movement of two opposing pressure systems, the Aleutian Low and the Pacific High. The Aleutian Low is an extensive moisture laden maritime air mass that reaches its southern most position in winter, resulting in strong west to northwesterly air flow into the region. As summer approaches, the Pacific High begins to dominate the weather and greatly reduces available moisture. Localized, convective-type, high intensity storms are common in the area during the summer and fall (U.S. Forest Service and National Park Service 1965:10).

Mean annual precipitation varies from over 60 inches in the vicinity of Snowy Peak to less than 15 inches in the Stanley Basin. The extreme orographic effect of the mountain range on precipitation is readily apparent.

Snow accounts for 83 to 86 per cent of the precipitation, remaining on the ground late into the spring. Snowfalls are not uncommon in September, and may, in fact, occur at any time during the summer months.

Temperature extremes vary from as low as the -50°s F. in winter to as high as the mid-90°s F. in summer. Data collected at the Obsidian weather station, six miles south of the Redfish Valley, indicates that, on the average, there are only five days in the year when the temperature does not go below 32° F. (U.S. Forest Service and National Park Service 1965:10). One reason for the colder average temperature for the Obsidian station in comparison to a station at a comparable elevation on the western side of the Sawtooths is that the cold air drains from the upper elevations of the mountains down through the various subdrainages into the basin, while the westerly winds tend to dissipate the cold air masses on the west side.

> The tendency for dense masses of cold air to drain down the valleys at night and slide under the less dense layer of warm air results in temperature inversion i.e., inversion of the normal vertical gradient of atmospheric temperature. This phenomenon is very pronounced in the Rocky Mountains, and its influence can be recognized in almost any series of temperature data. During four seasons of study in the mountains of northern Idaho, Hayes recorded inversions of 89-99 percent of the nights between May 1 and Sept. 30, inversions which attained an average magnitude of 18° during the month of August (Daubenmire 1943:347).

Soils. Within the Stanley Basin Province, soils have developed on glacial, stream and lake deposited materials.

The depth of unconsolidated material is not known, but may exceed a hundred feet, as illustrated by the bedrock channel of the Salmon River exposed to that depth below the Pinedale surface of the Redfish Valley floor. Bedrock is dominantly granitic from the Idaho batholith.

Glacial troughs, such as Redfish Valley, are filled with the deposits of gravelly to stony, moderately coarse textured glacial till, colluvium and alluvium (Arnold and Megahan 1964:15).

Flora. Five vegetation zones are identified from the valley floor to the alpine area in the Sawtooth area. These zones are characterized by dominant plant species which generally reflect moisture and temperature.

> The Ponderosa Pine Zone occupied the warmest and driest position of the conifer zones. It was confined entirely to the lower canyons of the west side of the study area. The Sagebrush-Grass Zone as such was the area of lowest rainfall but with relatively low temperatures due to cold air drainages. This zone occupies the Sawtooth Valley-Stanley Basin area. The Douglas-Fir Zone is intermediate in temperature and moisture except where these factors are modified by the rain shadow and cold air drainages in Sawtooth Valley. In this portion of the zone, lodgepole pine prevail. The Spruce-Fir and Whitebark Pine-Barren Zones are associated with a cold humid climate. The Spruce-Fir Zone occupies the high canyons and basins of the upper elevations while the Whitebark Pine-Barren Zone is generally confined to the peaks and high ridges. Some of the higher head basins are also included in the latter zone (Lewis and Riegelhuth *in* Arnold and Megahan 1964:14).

Plant Community Organization within the Zone

Sagebrush-Grass Zone

Artemisia/Festuca idahoensis community
Lower elevation meadow communities

Ponderosa Pine Zone

Pinus ponderosa/*Agropyron inerme* association
Pinus ponderosa

Douglas Fir Zone

Pseudtsuga menziesii/*Carex geyeri* association
Artemisia tridentata/*Agropyron* association
Mountain brush communities
Pinus contorta/*Carex geyeri* community
Pinus contorta/*Calamagrostis rubescens* community
Pinus contorta/*Vaccinium scoparium* community

Spruce-Fir Zone

Picea-Abies/*Carex geyeri* association
Picea-Abies/*Vaccinium scoparium* association
Mid elevation meadow community

Whitebark Pine-Barren Zone

1. Well-drained soils - subalpine turfs
   Sibbaldia/*Cassion* community
   Carex Tolmiei community
   Juncus drummondii community
2. Upper elevation wet meadow communities

(Taken from Mont Lewis and Richard Riegelhuth survey *in* Arnold and Megahan 1964:14).

Mr. Thomas A. Phillips, range conservationist, U.S. Forest Service, Sawtooth National Forest, surveyed the immediate area of the Redfish site in August, 1972 and found only two species of plant life which would be of food value: wild strawberry and hips of the wood rose. Phillips listed the following edible plants which grow in Stanley Basin but were not seen near Redfish Overhang:

Camas, *Camassis quamash*, in meadows throughout Sawtooth Valley and around Stanley.
Broadfruit mariposa, *Calochortus eurycarous*, common in sagebrush.
Serviceberry, *Amelanchier alnifolia*, along streams and around lakes.
Indian potato, *Orogenia lirearifolia*, early spring type in sagebrush type.

Whitestem gooseberry, Ribes inerme, along streams and in canyons.
Prickly currant, Ribes lacustre, along streams and in canyons.
Gooseberry currant, Ribes montigenum, along streams and in canyons.
Western black currant, Ribes petiloare, along streams and in canyons.
Sticky currant, Ribes viscosissimum, along streams and in canyons.
Huckleberries, Vaccinium spp., also occur under timber and along streams.
Thimbleberry, Rubus parviflorus, along streams.
Raspberry, Rubus idaeus, often found at foot of talus slopes in this area.

Mammals. From the valley floor of Stanley Basin (6,300 ft. a.s.l.) to the crest of the Sawtooth Range (10,600 ft.) the Transition, Canadian and Hudsonian life zones are recognized (Merriam 1891 in Arnold and Megahan 1964). Within each habitat typical species of animals and birds may be found. There is a definite crossing of zones under seasonal influences. Big game species include antelope, Antilocapra americana, black bear, Euarctos americanus, mountain goat, Oreamnos americanus, elk, Cervus canadensis, and mule deer, Odocoileus hemionus. Two species of large game are reported to be extinct in Stanley Basin: big horn sheep, Ovis Canadensis and grizzly bear, Ursus horribilis, the former due to heavy hunting and disease contacted from domestic sheep, the latter exterminated by the sheepherders.

Mountain lion, Felis Concolor, coyote, Canis latrans, and bobcat, Lynx canadensis, still are to be found in the area, although not as numerous as they were 50 years ago. Furbearers such as beaver, Castor canadensis, mink, Mustela vison, and marten, Martes caurina, were all but exterminated by the trappers of three major fur companies operating in Idaho in the first half of the 19th century.

It is not known whether bison, *Bison bison*, ever occupied the Stanley Basin. Historical archives give conflicting reports. The severe winters would argue against a permanent habitat, although some animals may have grazed in the basin on a seasonal basis.

Birds. Birds typical of the mountainous regions in this part of North America are found in abundance. Among these, game birds include blue grouse, *Dendragaous obscurus*, ruffed grouse, *Bonasa umbellus*, Franklin grouse, *Capachites franklini*, sage grouse, *Centrocercus urophasianus*, and mourning doves, *Zenaidura macroura*. Hungarian partridge, *Perdix perdix*, and chuckar partridge, *Alectoris graeca chukar*, have been imported in recent times.

A variety of waterfowl are found along the lakes and streams. Ducks include: Mallard, *Anas platyrhynchos*, Pintail, *Anas acuta*, Blue-winged Teal, *Anas discors*, Green-winged Teal, *Anas carolinensis*. Canada goose, *Branta canadensis*, is reported, and Western Grebes, *Aechmophorus occidentalis*, nest in colonies on larger lakes of the Sawtooth area (Sandkuhle 1968).

Fish. Probably the greatest faunistic attraction to the area is the extensive runs of anadromous fish in the Salmon River and tributary streams. Three species of fish travel from the Pacific Ocean to the upper Salmon River to spawn, a distance of over 800 stream miles. Sockeye salmon, Oncorhynchus nerka, spawn in the stream inlets of Redfish Lake. Steelhead trout, Salmo gairdneri, migrate to many smaller tributaries to spawn and may return to the ocean. Chinook salmon, Oncorhynchus tschwytscha, return to spawn in the larger tributaries of the Salmon River and then die.

Native gamefish include cutthroat trout, Salmo clarki, Dolly Varden trout, Salvelinus malma, mountain whitefish, Prosopium williamsoni, and kokanee, Oncorhynchus perka kepperlyi, a landlocked blueback salmon which spends its entire lifetime in the fresh-water lakes or tributaries. It is this fish that gives Redfish Lake its name (Casebeer 1964:2).

It is not known how the glaciation of the Northern Rockies may have affected the anadromous fish spawning in these streams. Miller (1965:575) states that glaciation may have provided the stimulus for the evolution and speciation of such cold-loving genera as the salmons. Loading of the streams with glacial outwash may have had a decided effect on fish migration and spawning, but by the end of the Pleistocene it may be assumed that there were no barriers to fish migration along the Salmon River.

Glacial History

Climate and glacial episodes are of particular interest to archaeologists attempting to understand the environment of high mountain valleys at a time when early hunters were apparently using those areas in the wake of the melting ice.

For this reason, a brief summary of the glaciation of the Sawtooth Mountains follows.

Individual valley glaciers were widespread in the Rocky Mountains from Canada to central New Mexico during the Quaternary glaciations. Five Pleistocene glaciations are recognized. The last two are of interest to this report: the Bull Lake and Pinedale as identified by Blackwelder (1915) in western Wyoming, correlated to glaciations in the Sawtooth area (Ross 1937 in Williams 1961:3).

> The Bull Lake glaciation was defined by Blackwelder (1913:325) on the basis of large but erosionally modified moraines in the vicinity of Bull Lake on the northern flank of the Wind River range in western Wyoming. Because of morphological similarities to those in Stanley Basin, the deposits related to the earlier of the major glaciations in the area are referred to the Bull Lake advance. Blackwelder also described fresh boulder-strewn moraines representing an advance of lesser magnitude than the Bull Lake glaciation which surround large lakes in the Wind River range. Blackwelder's description of these moraines fit the young lake-damming moraines in Stanley Basin so closely that Blackwelder's term Pinedale is applied to the moraines and their associated outwash (Williams 1961:7-9).

Bull Lake glaciation consisted of two or possibly three stades, the last ending approximately 32,000 BP. An interglacial stage followed, ending with the onset of the Pinedale Glaciation 25,000 BP. This also consisted of three stades, the interstade between the last two commencing about 12,000 BP and the final stade, expressed in large cirques near the mountain peaks, from 10,000 to 6,500 BP (Richmond 1965, Table 2:227). It should be remembered that these dates are generally restricted to northern latitudes, and that the effects of glacial activity were not so pronounced nor did they last so long further south.

During the glacial periods the climate was more moist with less evaporation. Temperatures were somewhat lower than present. On the Snake River Plain summer temperatures were 4 to 5° F. lower than now. In the Northern Rocky Mountains temperatures were 17.5° F. colder. Snowlines were as much as 2,000 feet (600 m.) lower than at present. Winter temperatures then were much the same as at present. Summers were shorter and winters longer (Richmond 1965:228).

The Sawtooth Mountains on the west, in addition to the high White Cloud Peaks and the highest of the Boulder Mountain peaks east and south of the basin, were intensely glaciated at various times during the Pleistocene. The Sawtooth Mountains, generally higher in altitude than the nearby ranges, intercept moisture from the Pacific next in line after the coastal Cascades, and consequently, were more heavily glaciated. Prevailing winds during the Pleistocene were from the west, as they are now (Flint 1947).

> Westerly winds would have drifted fallen snow in an easterly direction, which would have removed snow from the west side of the Sawtooths to the east (Stanley Basin) side, at the same time removing snow from the east side of the basin and further depleting the amount of snow available for glacial ice on the east side (Reid 1947 in Williams 1961).

The eastern extension of moraines in the Redfish Valley appear to be remnants of a terminal moraine, most of which was carried downstream in the meltwater of the glacier and redeposited on the glacial outwash fan which forms the large meadow in the arc of the river south of Stanley (Dort personal communication, 1972).

A shallow lake may once have covered the present floodplain of Redfish Lake Creek as the glacier began to melt and before the terminal moraine was fully removed. Evidence of clay lenses at the base of large glacially rafted boulders encountered in the excavation of the site attests to the possibility of such a lake.

The early stade of Pinedale glacial activity (25,000 to 21,000 BP) was the most intense. During the glacial maxima, the Redfish glacier appears to have abutted the Salmon River Mountains covering the area occupied by the overhang. Richmond (1965:226) indicates that the recession of the glacier during the interstade separating the early and middle stades (21,000 to 18,000 BP) was minimal, ranging from almost none to a few kilometers. A prominent recessional moraine at the northeast end of Little Redfish Lake, which appears to dike the lake, probably marks the extent of the early retreat. The interstade separating deposits of the middle and late stades is characterized by as much as 15 miles of recession for larger glaciers of the Northern and Middle Rocky Mountains. During this period, the Redfish Glacier retreated into the mountain area, leaving the valley open and the surrounding hillsides and moraines comparatively free of ice. The late stade of Pinedale (10,000 to 6,500 BP) is represented by weaker pulses of activity limited to the high cirques.

<u>Late Pleistocene Flora.</u> In the deglacial hemicycle,

plant communities almost immediately began a succession of growth in the wake of the retreating glaciers (Davis 1958).

> The first arrivals were pioneers, able to migrate rapidly. Some of them were specifically capable of supplying nitrogen to the ground, thus promoting the development of soil. Such plants were followed successively by those that could migrate only at slower rates, but were more stable. We can suppose that those elements of the fauna, particularly the mammal fauna that did not become extinct during the deglaciation, kept pace with the movement of plants and took their places once again in communities that provided favorable habitats (Flint 1971:516).

Dr. Karl Holte (personal communication, 1973) observes that weedy annuals such as pepper grasses, penny royal, chenopodiacae and amarantha would have followed the retreating ice. The xeric shrub-grass community would then follow, and the forest, primarily lodgepole pine, Pinus contorta, would quickly reestablish itself. Heusser (1965: 481) says that plants thrived along the glacial border in the Pacific Northwest and that the post-glacial recolonization of deglaciated ground by plants proceeded from unglaciated tracts.

It may be assumed that even under heavy forest cover the Stanley Basin and certain mountain areas supported open parklands attractive to grazing and foraging animals, similar to those that exist today, if not so extensive. Some areas appear to be naturally inimical to tree growth:

> Aspen, lodgepole pine and blue spruce frequently form thin marginal zones about the peripheries of parks, but even these trees seem entirely incapable of invading the open park (Rasmussen in Daubenmire 1943:383).

These parklands are due to a number of conditions such as forest fires which regularly account for some treeless areas, while others are situated in the bottoms of shallow basins or broad aggraded valleys which are surfaced with a thick mantle of fine alluvium washed from the surrounding slopes. These fine textured, compact or poorly drained soils, lacking aeration, may be detrimental to the seedlings of certain conifers, while advantageous to some species of grasses and forbs (Rasmussen _in_ Daubenmire 1943:385). As the climate warmed and summers tended to become somewhat longer, the margins of these meadows would have an opportunity to dry, thus providing the conditions under which camas, _Camassis quamash_, and similar plants may propagate. Some parts of Stanley Basin and Redfish Valley were no doubt ice free at one time or another during the entire Pinedale glaciation.

It can be inferred from the above that the forest, open parklands, modern varieties of shrubs, grasses and food producing plants were established within the Stanley Basin in the two to three millenia following the retreat of the glacial ice.

Prehistory and History

The mountains and rugged terrain of the Sawtooth area proved an effective barrier to early explorers and trappers of the 19th century and a refuge to the _tukudeka'a_, or mountain sheepeaters, who hunted and fished within this vast wilderness. These people were part of the Northern Shoshoni, nomad hunters and gatherers in the lands which now comprise southern Idaho to the mainstream of the Salmon River (Stewart 1938:172, 187; Liljeblad 1957:104-111; Murphy and Murphy 1960:329-331). The Northern Shoshoni form a branch of the Uto-Aztecan linguistic family, extending from the Wind River country of central Wyoming across the Great Basin, through Mexico and finally to Guatemala. The antiquity of these people is unknown. Swanson (1964) argues that they have been in the vicinity for the last 8,000 years. Steward suggests that they may have arrived as late as 1,000 years ago.

The territory of the tukudeka'a generally included the drainage systems of the Salmon River. The Lemhi Shoshoni, occupying the Lemhi and Lost River Valleys east of tukudeka'a territory, were often considered to be associated with them, but following the adoption of the horse, the two groups followed different paths; the Lemhi influenced by the plains mode of life, the tukudeka'a retreating into the isolation of the mountains. They were considered to be sort of "country cousins" to the more free wheeling horse mounted Shoshoni, slow of speech and conservative of the old ways. Although "boundaries", as such, would have been incomprehensible to the Northern Shoshoni, if any group could be said to be associated with a given area, the tukudeka'a were associated with the central mountains and the Salmon River.

The social and political organization of these people was simple. There were few villages (Steward lists three). Two or three families, sometimes more, might band together for hunting and fishing, or perhaps winter together in larger gatherings. A leader might be chosen from the group to lead a hunt, or someone might simply volunteer. At times a respected elder or the head of the family made necessary decisions.

Tukudeka'a fared better economically than many of the other Shoshoni. Food resources were varied and abundant. Salmon were taken in the upper waters of the Salmon River and were readily caught by dams and weir, as well as hooks, harpoons, clubs and baskets. Elk, deer and big horn sheep were hunted. Berries and seeds, as well as camas and cous, were available.

The mountain people were skilled hunters and renowned for the fine bows they made of mountain sheep horn. They were experts in the preparation of hides which they traded for buffalo meat at the annual gathering of Shoshoni and Bannocks at Big Camas Prairie west of the Big Wood River.

Recent History. Alexander Ross (1956:213) led a party of Hudson Bay trappers up the Wood River in 1824, crossed the Boulder Mountains southeast of Galena Summit, and by a circuitous route, eventually reached the mainstream of the Salmon River and explored the territory around it. The beaver supply proved disappointing, however, so few trappers returned to the region.

A party of American Fur Company trappers probably were the first company of white men to enter the present Sawtooth Valley in 1831 (Ferris 1940:3). They recounted meeting there a group of "root diggers" (Northern Shoshoni) who had no horses and were hunting elk, deer and mountain sheep, and catching salmon. The trappers carried with them a supply of dried buffalo meat, for they had been warned by an Indian guide that there was no bison to be found in that wild district (Ferris 1940:81).

In 1832, Captain Bonneville and a small party spent part of December in Stanley Basin and according to the report, enjoyed good hunting:

> Capt. Bonneville soon found that the Indians had not exaggerated the advantages of this region. Besides numerous gangs of elk, large flocks of ashanta or bighorn, the mountain sheep, were to be seen bounding among the precipices. These simple animals were easily circumvented or destroyed. A few hunters may surround a flock and kill as many as they please. Numbers were daily brought to camp, and the flesh of those which were young and fat were extolled as superior to the finest mutton (Irving 1961:72).

Bonneville's Indian allies had described "herds of buffalo a little distance beyond the valley," which contradicts the Ferris report. Whether there ever were bison in Stanley Basin in early historic times remains unclear.

No records remain of American trappers in the basin after 1833. With little beaver available, the fur companies abandoned it in order to exploit more lucrative regions.

In 1860, the discovery of gold at Orofino Creek, 165 miles north of Stanley, explosively opened up the territory. The <u>tukudeka'a</u> avoided contact with the miners who poured into the Salmon River country by retreating still farther into the mountains. The miners were highly apprehensive of the Indians, however, and accused them of several murders which took place in isolated areas, taking retaliation by killing natives in return. During the Nez Perce War of 1877 and the Bannock War of 1878, the "Sheepeaters," along with other Indians of Idaho, showed a certain "restlessness," resulting in a decision by the Army to round up the recalcitrant Indians. A battle ensued with the Indians the eventual losers. Fifty-one individuals were moved to the reservation. A few remained behind following the old way of life in the mountains for a few more years.

Ranching began in the Sawtooth Valley in 1899 on a year-round basis. Livestock grazing had been transitory since 1879 when bands of sheep were brought in to graze the summer ranges. More sheepmen soon followed and, within a few years, sheep numbers became so great that it was almost impossible to graze the animals on open range. Ketchum, a railhead in Wood River Valley south of Stanley Basin, was the largest sheep and lamb shipping point in the United States for many years.

As for the Redfish Overhang, a wagon and sheep trail passed directly in front of the site. The trail followed the river north from the Galena Summit, through the town of Obsidian, eventually winding over the south moraine and into the Redfish Valley. A bridge was built over the creek some 300 yards from the overhang. The road crossed the floodplain and headed north seven miles to the town of Stanley.

Thousands of sheep were herded up this road and across the bridge to graze on the floodplain before heading north to the meadows beyond Stanley. The ravaged condition of the plant cover (Phillips 1972) reveals the extent to which it was used. The rock overhang must have sheltered hunters, travelers and shepherds at one time or another.

Between the early 1920's and the 1940's, a local citizen named Frank Brockway used the overhang as a summer campsite. He is reported to have cut timber south of Redfish Lake and delivered mail to Stanley from the post office in Obsidian. He was known as a hermit and from this era the overhang came to be known as "Brockway's Cave" or the "Hermit's Cave." Brockway built a lean-to across the east side of the shelter entrance (David Lee personal communication, 1972) with the result that hundreds of scraps of tar paper from this construction were encountered in the upper strata of the excavation, as well as square head nails, spikes, tools and other debris from this and other occupations.

Excerpt from a crew member's notebook:

> Thursday, July 13. Sandy and I began by delineating garbage pit in Block 62 in order to graph it more accurately. Found rimsherd near West wall. Accidentally broke it in two, but will glue it together. Found another rimsherd same level 2 cm north of first potsherd (noticed that this one fits together with the first one). Subsequently, Sandy found a small flake at western rim of garbage pit pedestal (10 cm below Datum 62). We then graphed garbage pit, consisting of cans and bottles. Our remarkable inventory after garbage pit excavated, consisted of: 1 bottle "Uncle Remus" molasses, 1 bottle Karo Syrup, 3 cans vegetable soup, 2 unidentifiable cans, <u>and</u> 20 cans "Sego" evaporated milk!

We also found many pieces of old glass, much of it discolored from lying in the ground, in the vicinity of two earth ovens. While these pieces may have had no significance, and may have been carried there by the ubiquitous ground squirrels, the color and manufacture prompted speculation that these may date back to mining days in the late 19th and early 20th centuries, and have contained trade goods such as whiskey. The provenience of the earth oven suggests the preparation of food, probably camas or perhaps salmon for trade to the miners and travelers in the Sawtooth Valley.

Shoshoni Indians from Fort Hall Reservation fished on the Salmon River near Redfish as late as 1927. In addition, Shoshoni from Salmon, Idaho, northeast of the Stanley Basin, came to that section of the Salmon River between Stanley and Clayton, to fish in the late 1920's, as reported by Ted Williams, long-time resident of the Stanley area (Ted Williams personal communication, 1972).

The intermingling of the rimsherds and the white man's garbage pits is a small irony of modern Stanley Basin. A larger one is the occasional drifting back of small Shoshoni groups to fish in what is now a white man's stream in a white man's wilderness.

Excavation Tactics

As noted earlier in this thesis, a test pit was dug at the Redfish Overhang in 1971. Sufficient evidence of aboriginal use was uncovered to warrant a full scale excavation of the site. Accordingly, during an eight week period in the summer of 1972, five members of the Idaho State University Field School accomplished the project under the supervision of Professor B. Robert Butler.

In determining the perimeters of a grid system for control of the excavation three factors were considered:

1. The contour of the sloping terrace from the boulder mass to the floor of the floodplain.

2. The orientation of the slope to the interior of the overhang.

3. Identification of those areas which logically might be expected to yield evidence of work or habitation use.

A north-south base line, 39° west of magnetic North, was established two meters west and parallel to the west wall of the original test pit at the mouth of the overhang. A perpendicular east-west base line was then established with Datum point "0" designated at the intersection. The perimeters of the excavation fell within the northeast quadrant of the grid.

The site was staked in a grid network of two meter square blocks, each numbered in relation to the base lines. Blocks east of Datum "0" were numbered in increases of 10. Blocks north of Datum "0" were numbered in increases of 1 (Fig. 6).

Vertical control was related to the northwest corner of each two meter block. The elevation of Stake #15 (the highest point on the working grid) was arbitrarily designated at 5 meters. Elevations of other stakes were determined in relation to Stake #15.

The strata at the Redfish site are composed, for the most part, of unsorted moraine materials, redeposited within the overhang and on the terrace. Small amounts of volcanic ash and limited rooffall were also encountered. Whatever structural differences occur are the result of soil forming processes. The modern soil profile tends to mask variations, consequently, the color of soil horizons is the primary differentiating factor of the profile *in situ*. Later, in the laboratory, when the soil samples were analyzed, structural differences were noted (Figs. 8,9). The soil horizons provided a kind of observable natural stratigraphy, and the layers were numbered on this basis in the field.

Within this framework, excavation proceeded by arbitrary 10 cm levels. Floors of each block were stripped by vertical intervals allowing features to be exposed and artifacts to be revealed *in situ*.

Due to the considerable disturbance of the upper two layers immediately in front of the chamber, delineation of stratum in these areas was difficult. Two large earth ovens were revealed in Layer 2 on either side of the middle boulder at the mouth of the overhang. Both of these ovens intruded well into Layer 3A.

Excavation of the upper strata was generally accomplished by troweling into dust pans. Picks were used to break up heavy sod. In sections where large boulders made progress slow and tedious (Fig. 7b) shovels and picks were used. All materials from these layers were screened through one-quarter inch mesh.

Twenty-five blocks were opened by hand, five of these in one meter wide trenches. Ten cm wide balks were preserved as long as useful between adjoining blocks to permit correlation of stratigraphy. Profile drawings were made of all exposed vertical walls, of features, and in some cases, of horizontal floors.

A trench 12 m in length extended from the back of the overhang, west side, almost to the level of the floodplain in front. A parallel trench on the east side of the grid allowed correlation of vertical profiles. Here, the stratigraphy was relatively compressed, and average depth was one meter. Transverse and longitudinal sections together allowed a complete profile of the site.

Modern cultural remains, faunal remains, and waste flakes were collected in level bags. Horizontal and vertical measurements were made on all artifacts, and these were bagged separately with recorded data.

Two soil columns were removed intact from Blocks 23 and 82 on the terrace. Soil samples from three vertical walls were also collected. A soil monolith was removed from the rear wall of the chamber to facilitate study of the soil profile in the laboratory.

IV. STRATIGRAPHY

In attempting to reconstruct the past history of deposition of these sediments, I asked the assistance of several specialists. Dr. Maynard Fosberg, Professor of Soils, University of Idaho, Moscow, analyzed a soil column taken from the vertical wall of Block 82 on the terrace of the site. Mrs. Mary Strawn, Assistant Professor of Geology, Idaho State University, Pocatello, performed additional mechanical analysis of selected sediments by hydrometer and sieve. Both Mrs. Strawn and Dr. Thomas Ore, Professor of Geology, Idaho State University, assisted with interpretation of stratigraphy.

The deposits on the east side of the overhang appear to have entered the cavity via the opening on the back northeast corner formed by the angle of the roof block and the massive east side boulder. Dr. Wakefield Dort examined the stratigraphy of the site in situ, as did Dr. Alan Bryan and Dr. Ruth Gruhn, Professors of Anthropology, University of Calgary. All agreed that solifluction and colluvial action are responsible for the movement of materials from the moraine down through the passageway which acts as a funnel to the interior of the chamber, and from there out through the mouth of the overhang onto the terrace which slopes to the flood plain of Redfish Lake Creek, a distance of six meters.

Fosberg's analysis defines structural differences of the upper five layers resulting from soil forming processes. In situ, the layers are distinguishable primarily on the basis of color, i.e., Layer 5: light yellowish brown drying to grey white, Layer 4: red-yellow (hematite), Layer 3: yellow (limonite), Layer 2: very dark brown to black, Layer 1: grey brown. These colored layers were noted in excavation, however, the homogeneity of the fill necessitated digging by arbitrary 10 cm levels.

The boulders of the overhang were most likely buried in moraine sands and embedded in ice during the glacial maxima of the first Pinedale stade, ca. 25,000 to 21,000 BP. The Redfish glacier probably retreated only as far as the northeast end of Little Redfish Lake during the interstade, for Richmond (1965:226) states that recession during that period in the Northern Rocky Mountains was slight. The overhang may have been exposed at that time for, according to Dort (personal communication, 1972) there has not been ice in the valley in the vicinity of the overhang for at least 15,000 years.

At some time during the deglacial hemicycle, melt water must have scoured moraine deposits from the interior of the overhang. Redfish Lake Creek, as a youthful stream, perhaps flowing on the north side of the floodplain, deposited sands on the floor of the chamber. During periods of thawing, unconsolidated materials from the moraine began to flow by means of solifluction into the back of the overhang, mixing with the stream-laid sands. This kind of scouring and filling may have occurred many times before the stream cut its present channel on the south side of the floodplain and the present deposits began to fill the chamber.

Since the deposits on the site are channeled, for the most part, through the overhang, the stratigraphy in the chamber on the terrace are essentially the same. In the back northeast wall, in front of the rear opening, the strata tend to be compressed and better preserved. The three upper layers on the west side are thicker than elsewhere due to additional direct deposition from the adjacent slope. Deposits on the west accumulate under the receding curve of the roof as it dips into the moraine and bank against the protruding middle boulder.

Bedrock is reported at a depth of 100 feet or more in the glacial troughs of the Sawtooth area. Glacial till and moraine deposits of unsorted sands, boulders, cobbles and silt presumably comprise the regolith underlying the strata at the Redfish site.

Six layers comprise the stratigraphy of the Redfish site (Figs. 8 and 9). Fosberg's analysis revealed subdivisions of the three upper layers not discernible in excavation. The soil horizons are those of the modern profile of the strata, since the facies of each layer have adjusted to the present environment. Past soil structures can be inferred in relation to the paleosols of Layer 4 and the buried A1 horizon of more recent times.

Soil Description - Dr. M. A. Fosberg.

A1 0-10 cm. Greyish brown (10YR 4.8/2.2); gravelly sandy loam very dark greyish brown 10YR 3.2/2.2 moist; weak very fine granular structure, 43 percent, angular granitic gravels; wavy boundary.

A3 10-20 cm. Greyish brown (10YR 4.6/2) gravelly sandy loam; very dark greyish brown (10YR 2.8/2) moist; very weak medium subangular blocky structure; 38 percent angular gravels; smooth boundary.

B1 20 to 41 cm. Dark greyish brown (19YR 4/2.2) very gravelly loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky breaking to strong granular structure; 57 percent fine and medium, angular granitic gravels; wavy boundary.

Comments: This is definitely a buried A1 horizon which represents a former surface. This is determined by the darker color and the horizon with the highest organic carbon.

B21 41 to 49 cm. Dark greyish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; weak medium prismatic breaking to weak fine subangular blocky and medium granular structure; 42 percent fine and medium granitic gravels; wavy boundary.

Comments: This horizon is also high in organic carbon and appears to have been part of the original A1 horizon represented by the horizon above.

B21 49-59 cm. Brown to dark brown (10YR 4/2.7) gravelly loam; dark brown (10YR 2.6/3.4) moist; weak medium prismatic breaking to weak fine subangular blocky and medium granular structure; 37 percent gravels, wavy boundary.

B3 59-71 cm. Brown (10YR 5/3) gravelly sandy loam; dark yellowish brown (10YR 3/4) moist weak fine subangular blocky and medium granular structure; 48 percent fine and medium granitic gravels; wavy boundary.

(This horizon has a definite stone line at surface of horizon and appears to be an old surface.)

C1 71-78 cm. Brown (10YR 5/3) gravelly sandy loam; dark yellowish brown (10YR 3/4) moist; 28 percent fine granitic gravels; wavy boundary.

Comments: This horizon shows very little evidence of horizon development. However, there is weak structure characteristic of a B, therefore, may represent a buried B. Also it has a slightly darker value than horizon below. (In a reexamination of this particular horizon, Fosberg stated that it is a definite buried B horizon).

C2 78-87 cm. Light yellowish brown (10YR 6/4) gravelly sandy loam; structureless; 40 percent fine and medium granitic gravels.

(Layer 6 - a mixture of alluvial and colluvial materials was not included in Fosberg's sample)

Further observations on the Redfish sediments follow, beginning with the lowest and proceeding to the surface.

Layer 6 - This layer is composed of yellow-brown coarse to fine sands and cobbles found primarily within the overhang cavity. These appear to be deposited by the alluvial action of Redfish Lake Creek mixed with colluvium from the moraine. Clay lenses appear at this level on the terrace and may indicate the presence of an ephemeral lake dammed by the terminal moraine. Exploration of Layer 6 was accomplished by means of a test pit, 1 m square and 40 cm deep, at the back of the overhang on the east side, in the autumn of 1972. Scattered pieces of charcoal were found, but not in sufficient quantity to allow radiocarbon dating. This layer is tentatively correlated with the beginning of the second interstade of the Pinedale Glaciation, 12,000 to 10,000 BP.

Layer 5 - (Fosberg:C2) This band of unsorted colluvium, 50 cm to 70 cm in thickness, surrounds the lower sections of the large, glacially rafted boulders submerged in the terrace deposits and partially exposed on the floodplain. It is light yellowish brown drying to greyish white when exposed to the air. Chemical testing indicates only slight calcium carbonate content. Fist-sized cobbles and larger are common. Charcoal taken from the upper part of Layer 5, northeast wall of the chamber, is radiocarbon dated at 10,100+300 (WSU 1396).

The midsection of a lanceolate point, identified as "Haskett" was found in screening the lowest gravels of Layer 5 from the northeast wall of the overhang. There are numerous charcoal lenses and a few scattered pieces of debitage in that area, but on the terrace, the layer is sterile.

The layer is correlated with the latter part of the second interstade of Pinedale Glaciation, possibly between 11,000 or 10,600 to 10,000 BP.

Layer 4 - (Fosberg:Cl) Fosberg (personal communication, 1973) indicates that this is definitely weakly developed buried B horizon (paleosol). *In situ*, Layer 4 has a definite red-yellow color and a crusty texture. Flint (1971:294) states that in a period of increasing warmth, soils take on yellowish and reddish colors, owing to the accumulation of secondary iron oxides created by the breaking down of iron-bearing minerals. The hematite stain of Layer 4 would seem to reflect a somewhat warmer and more stable climate than that which had preceded it (Strawn personal communication, 1973).

Evidence of early occupation of the site is substantiated by artifacts found *in situ* at the interface of Layer 3 and Layer 4. A hearth in association with the artifacts is radiocarbon dated at 9,860±300 BP (WSU 1395).

Richmond (1965) indicates that weakly developed paleosols formed in the Northern Rocky Mountains circa 10,000 years ago. I propose that Layer 4 fits well into this category and must have developed between 10,100 BP (the data for the upper gravels of Layer 5) and the hearth date, 9,860 BP.

An alternative hypothesis can be offered: Layer 4 developed as a B horizon after 8,060 BP. The A horizon for the profile has changed facies or is missing. Soil formation took place under the stone line at the interface of Layer 3A and Layer 3B, a surface which evidently lay exposed for a long period of time (see following discussion).

Layer 3B - (Fosberg:B3) Fosberg notes a definite stone line at the surface of the horizon which appears to be an old surface.

This stratum may represent the A horizon of Layer 4 beneath it. A change of soil facies has occurred through such factors as leaching, erosion, or mixing of new sediments, so that it now presents a facies adjusted to its present local environment in the total soil profile (Flint 1971:298).

Layer 3B was indistinguishable during the excavation from Layer 3A above it, except in the northeast wall of the overhang chamber. Here the dark organic color was preserved, thus presenting a facies more characteristic of an A horizon. Thickness of the layer within the overhang appears to be about the same as in Fosberg's description--12 to 15 cm.

Charcoal from a hearth located in this layer is radiocarbon dated at 8,060±285 BP (WSU 1397). A large side-notched projectile point was found in the upper part of this layer. These have been dated in the Birch Creek Valley (Swanson et al. 1964) at about 7,000 BP. While it is risky to date geologic material by cultural material in such a context, I suggest that the deposition of Layer 3B had probably ceased by 7,000 BP.

Several medium-sized, flat spalls of rooffall may be associated with Layer 3B, although because of their position, it is difficult to correlate them with a particular layer. The spalls are wedged between the middle granite block of the overhang and the wall formed by the west slant of the roof as it dips into the moraine. Layers 4 and 5 give way to sand under the spalls, so whether they were in position before or after the deposition of the bottom layers is not known. Rockfall has been correlated with increased moisture and frost action (Fryxell and Daugherty 1963; Ranere 1968:95). Small scale spalling may result from hydration of the granite on the ceiling of rock formations. Conditions of a typical spring when alternate freezing and thawing occurs in the Redfish Valley would be sufficient to produce rooffall of this kind (Ore personal communication, 1973). The cooler, moister climate of the Valders Stade of Pinedale Glaciation, 10,000 to 6,500 BP (Richmond 1965:Table 2, 227) presented such conditions.

Layer 3A - (Fosberg:B21) This stratum varies in thickness from 10 cm on the east side of the terrace to 27 cm in the northeast wall of the overhang. On the west side of the site, it may be as much as 80 cm thick; however, because of the paraconformity between Layers 3A and 3B it is not possible to delineate the boundary in this area.

A radiocarbon date from composite charcoal in the lower part of Layer 3A is given at 670±130 (WSU 1410, 1410B). Two hypotheses are offered to explain the temporal disconformity between Layer 3A and 3B.

1. The surface of Layer 3B was exposed for the time interval with no new accumulation of sediments taking place.

2. Deposition of sediments did occur on top of Layer 3B, but these were subject to erosion in the period following 7,000 BP. This disconformity presents a puzzling situation, for we know from climatic studies in other areas that there were a number of oscillations in both temperature and precipitation amounts in the intervening period of time. Butler (1968, 1973b) also notes a cessation of deposition at the Wasden site on the Snake River Plain at this same point in time. Until further investigation of the stratigraphy on the Redfish site or in the immediate vicinity takes place, the question of deposition and erosion of sediments above Layer 3B must remain unanswered.

The soil profile exposed in the excavation of the back opening to the overhang revealed a krotavina in the brown loam correlated tentatively with Layer 3A. This section is a meter higher than the floor of the overhang and formed the ramp by which entry to the chamber could be gained from the moraine slope. The layers within the ramp are very disturbed both from human and rodent activity, as well as from thick roots of the aspen just behind the boulders. The krotavina, 15 cm in diameter, likely an old rodent run, or the cavity left by a decayed tree root, entered the earth ramp at this point. Except for dark grey sandy material at the bottom, similar to silty sand found in other rodent runs, it was filled with fine volcanic ash.

Ash also appeared in an isolated deposit in Blk. 45 in the east side midsection of the chamber. Samples were taken from both deposits and submitted to the National Geologic Survey Department, Denver. The ashes are reported to be of the same volcanic deposition. A complete petrographic analysis has not been completed, but the following report is offered:

> Samples I and II contain a considerable amount of volcanic glass shards and glass mantled crystals. Shard morphology, microphenocryst content, and refractive index (n) of the volcanic glass, together with the heavy mineral crystal suite, differ from the Glacier Peak and Mazama ashfalls. The degree of hydration of the glass fragments from these samples, which can be observed using special microscope techniques, is less than that of Mazama ashfall and suggest . . . that these samples are younger than Mazama ashfall . . . Ashes younger than the Mazama do occur in the Stanley area, but we have done no petrographic work on them to date (Virginia Steen McIntyre personal communication, 1973)

Volcanic ash deposits which have been indexed, radiocarbon dated or dated by potassium-argon method and correlated to the source volcano provide ideal time markers for stratigraphy and archaeology (Morrison and Wright 1968: 82). Mantles of volcanic ash have been periodically deposited over large areas of the northwestern United States, many of them products of volcanic activity in the Cascade Mountain range of Washington and Oregon. Ash has also been reported from volcanic activity in Idaho, along the Snake River Plain and from Yellowstone Park, Wyoming, but these deposits have not, so far, been studied sufficiently to provide adequate time markers (Statham 1972). Ash from the Glacier Peak eruption in northern Washington has been recognized by Powers and Wilcox (1964) and Fryxell (1965) who dates the ash at 12,000 BP. Ash from the Mazama eruption at Crater Lake, Oregon, was dispersed from the northern Great Basin to the plains of Montana about 6,600 BP. Later ash deposits from Mt. St. Helens and Mt. Rainier in Washington have been dated between 3,000 and 160 years BP (Singer and Ugolini 1973). The dispersion of ash from these eruptions was limited, however, and it seems doubtful that the ash in the Redfish Overhang can be correlated to any of these (Singer personal communication, 1973). Identification of the Redfish ash must await further analysis.

Layer 2B - This layer and the one above it were indistinguishable in excavation and were treated as a single unit. Most of the cultural material of the redfish site was recovered from this layer. The soil is high in organic carbon content and generally pliable.

Layer 2A - (Fosberg:B1) Fosberg comments that this layer is definitely a buried A1 horizon which represents a former surface and is the horizon with the highest organic carbon.

Based on the radiocarbon date of 670±130BP (WSU 1410, 1410B) obtained from Layer 3A, all of Layer 2 must be of late prehistoric to historic deposition. Diagnostic cultural material supports this hypothesis. In addition to aboriginal artifacts, modern cultural debris was found, especially in the upper section. Numerous pieces of broken glass showing evidence of having been buried for some time were found scattered among the pottery sherds and chipping flakes.

Layer 1B - (Fosberg:A3) Observation of the layer in situ agrees with Fosberg's description.

Layer 1A - (Fosberg:A1)

The last layer described forms the present surface of the Redfish site and appears to be very disturbed. Modern trash pits were found just under the surface, the debris of many picnickers and campers. Literally hundreds of pieces of tar paper were unearthed in this layer, thought to be part of the lean-to shack built by Frank Brockway when he used the overhang as a shelter in the 1920's and 1930's. Several sherds of Shoshoni ware pottery were found just under the sod on the terrace.

Material Culture

Most material culture found in the excavation of the Redfish Overhang was recovered from the upper two layers, with a lesser amount from Layer 3, all giving evidence of late prehistoric occupation within the last thousand years. Analysis and description of the late cultural material will be found in Gallagher (1973).

Evidence of early occupation was first discovered on the terrace where a midsection of a large quartzite lanceolate point (Fig. 10a) was found in situ at the interface of Layer 3B and 4, 52 cm below the surface. The point fragment was situated between two large boulders approximately two meters from the east side block which forms part of the overhang. Butler identified it as a Haskett point, and when later compared with the complete Haskett point (Fig. 18f). also made of quartzite, from the Lake Channel Haskett site, it was seen to be similar in all attributes of size, outline, flaking technique and edge grinding.

Several weeks later, while excavating at the rear of the overhang on the west side, well back under the overhanging rock in a protected area of Block 26, we uncovered a cache of six large leaf-shaped blanks (Fig. 10c-e, g-i), three preforms (Fig. 10f,j,k), a small finished point (Fig. 10-1), two large side scrapers (Fig. 10n,o) and a multi-purpose tool (Fig. 10m). After the initial discovery, we proceeded with caution to photograph, map, and remove the items of the cache, excavating with trowel and brush.

The blanks, preforms, and scrapers of the cache were apparently randomly imbedded in sand, with no particular orientation or design to the arrangement (Fig. 11a). The single finished obsidian point was placed to the right of the other artifacts. Total circumference of the cache was 15 cm, with a depth of 13 cm. Lithic materials are obsidian and ignimbrite.

Several other cache sites are reported in the Northwest. Pavesic (1968:52-57) described a cache of eight projectile point blanks and one knife blank from Sterling, Idaho on a Pleistocene terrace at the edge of American Falls Reservoir. These blanks resemble Milnesand and Simonsen points and are tentatively dated between 6,000 and 8,000 BP.

An undated cache of 34 items was reported from Warner Valley, Oregon (Weide 1969). In a discussion of the lithic materials from the Coleman Quarry Site in northern Nevada (where Haskett points were found), Tuohy (1970:163) mentions these two cache sites, in addition to two others (Wormington and Forbis 1965; Coale 1956), containing artifacts similar to or identical with the bifaces and preforms from Coleman. Related chipped stone artifacts, according to Tuohy, have been found from Alberta to Baja, California and from California to Wyoming:

> Like those from Coleman, some are found in circumstances suggesting an Anathermal Age, others probably are younger in age. Interestingly, those not found at quarries and workshops in the north have been recovered from shallow cache pits (Tuohy 1970:163).

A rock-lined hearth, 25 cm deep by 20 cm wide, lay just behind and slightly to the left of the cache. Charcoal from the center of the hearth has been radiocarbon dated at 9,860±300 BP (WSU 1395).

The general impression of the cache, the random placement of the artifacts and the relation to the hearth, suggests that the owner had concealed the pieces, intending to return to complete the unfinished biface blanks and preforms. All specimens show collateral percussion flaking. Two of the blank specimens are of obsidian, the remaining three of ignimbrite. The preforms demonstrate progressive stages of manufacture, specimen #142 (Fig. 10k) showing clearly the typical Haskett outline. The edges of all have been straightened, the flakes are smaller, and they reveal a definite shape. All three preforms are of ignimbrite, as are the two large scrapers. The larger of the scrapers (#218) (Fig. 10n) shows little wear and appears to be from the same quarry source as three ignimbrite blanks. The other large scraper (#219) (Fig. 10o) demonstrates considerable wear and reworking. The composite tool (Fig. 10m) could have been used as a side scraper, end scraper or awl (Crabtree personal communication, 1973) obviously much used, for it shows extensive wear and reworking. Both this tool and the small completed Haskett point are of smoky grey obsidian. No evidence of reworking is apparent on the point. Smoothed ridges on all the artifacts may be the result of rubbing together in a carrying bag.

The cache and associated hearth were located in the same level of stratigraphy as the Haskett point fragment found in front of the overhang, that is, directly above the paleosol, Layer 4.

One other Haskett point fragment (Fig. 10b) was found in screening the lowest gravels of Layer 5. A charcoal sample from the upper part of Layer 5 is radiocarbon dated at 10,100±300 BP (WSU 1396). Since this point fragment was found in gravel well below the dated area, I infer that the artifact is older than the other Haskett material at Redfish, and suggest that it may be as old as Bedwell's (1970:232) earliest date for Haskett (or "P2" points) at the Connely Caves in south central Oregon. Bedwell's date is 10,600 BP.

All of the above mentioned artifacts, those from the cache as well as the two point fragments, have been identified as Haskett in form and technology by Butler (personal communication, 1972) and independently by Crabtree (personal communication, 1973).

Only two other projectile points and two point fragments were found in the early culture level at Redfish Overhang. One of the points, a small stemmed obsidian specimen very closely resembles the Silver Lake type. From its position in the stratigraphy, I do not believe it can be associated with the Haskett material, for it was found in the vicinity of a rock-lined hearth in Blk. 46, radiocarbon dated at 8,070±285 BP (WSU 1397). Silver Lake points are a common trait of the Lake Mohave complex in southern California and Nevada. Haskett points have also been associated with this complex. Only one other specimen is reported in Idaho (Butler personal communication, 1973) and its identification is questionable. The appearance of this point at a time somewhat later than the Haskett may have some significance for the chronology of multi-component sites elsewhere.

The other complete specimen, a large corner-notched point, is similar to points of this typology found in the Birch Creek Valley at about 7,000 BP (Swanson and Bryan 1964), and may indicate the inclusion of Stanley Basin in a cultural tradition exploiting high mountain valleys during the Protoarchaic period in eastern Idaho. This specimen appears to mark the termination of occupation of the overhang for the early period.

Debitage which can be associated with the early cultural level amounted to 118 pieces. Since Layer 3A and Layer 3B are indistinguishable in the excavation, identification of flakes with a certain stratum can only be tentative. Materials used include cryptocrystalline quartz, (chalcedony, agate, chert, flint and jasper), as well as obsidian, ignimbrite, rhyolite, basalt and quartzite. Figure 12 lists the various percentages of each material used, and compares these with Gallagher's figures for lithic material of the late prehistoric period at Redfish. It will be noted that the percentages are almost identical. Cryptocrystalline accounts for 61 per cent of the total, with obsidian used in slightly over 21 per cent of the flakes, and ignimbrite 7.5 per cent.

<u>Quarry sources</u> for the lithic material found at Redfish Overhang are abundant in the mountains surrounding the Stanley Basin, and from other areas within traveling or trading distance in several directions. Dr. Ralph Bennett, Professor of Geology, University of Idaho, Moscow (personal communication, 1972) states that there are several known sources of cryptocrystallines in the Sawtooth Mountains. The area east of Stanley and east of Redfish Lake is essentially granite with some overlying volcanic cover. These volcanics do contain some agate and chert. Dark, dense chert is located south and east of Galena Summit, 50 miles south of Redfish. Black chert is available near Slate Creek, east of Redfish, and red jasper occurs sparingly south and east of Galena Summit. Dr. Bennett reports two sources of obsidian very close to Redfish Valley, both at Sunny Gulch, a small canyon opening out of the Salmon River Mountains on the east side of the Salmon River, one mile north of Redfish. One other possible quarry is located on a low ridge above the town of Obsidian, six miles south of Redfish. Ignimbrite is reported in the Boulder Mountain range, southeast of Stanley Basin.

Gallagher (1973) has identified Timber Butte, six miles west of Banks, Idaho in the west central part of the state, as the probable source of obsidian used in making tools found at the Sheepeater site in the north part of Stanley Basin. Other sources for obsidian and ignimbrite are found on the Snake River Plain and Yellowstone Park.

Several large pieces and some smaller fragments of unusually clear, fine quartz were recovered from the early culture level. A single piece had evidently been shattered, for the debris was scattered through Block 45. It was at first thought to be part of a broken bottle, but Dr. Marshall Corbett, Associate Professor of Geology, Idaho State University, Pocatello, x-rayed the largest piece and reported it to be a high grade of quartz. Don Crabtree (personal communication, 1973) observed that pieces of clear quartz were not uncommon in early man sites, and that this piece may well have been carried by a hunter as a good luck charm or totem. Another source suggests that such a piece as this one may have been used in ritual ceremony:

> The initiation theory implies, among other things, that unusual objects might be found in vigil places. In primitive tribes persons undergoing such experiences generally bring good-luck pieces with them - polished or painted pebbles, clear quartz crystals, parts of animals (perhaps rabbit feet), and so on (Pfeiffer 1969:238).

Intrepretation

The number of artifacts and the amount of debitage found at the early level of occupation at the Redfish Overhang leave something to be desired. Despite the paucity of evidence, some idea of the activity areas of the site can be inferred from the distribution of chipping flakes (Figs. 13a,b), and the placement of hearths and artifacts (Figs. 14a and 14b). A comparison of the diagrams showing chipping flake distribution for the early period and the late prehistoric period indicates, not surprisingly, that about the same areas were used within and around the overhang by both peoples. The most noticeable difference is at the front of the chamber on the east side. This is by far the heaviest area of concentration in the late period. Here, too, we encountered an extensive earth oven. An earth oven of the late period was found on the other side of the chamber as well, but here there were few waste flakes (24 in comparison to 222 on the east side). It is puzzling that so many flakes would be found near the oven, but perhaps it was used for warming purposes as well as baking, or possibly for heat treatment of lithic material (Crabtree and Butler 1964).

A number of small hearths were found at the lower levels, especially on the east side toward the back of the overhang. Heavy smoke stains on the walls indicate many fires over a long period of time. The back opening on the east side provides a good draft for fires which probably accounts for the popularity of the spot. Aside from the large hearth associated with the cache, there were only a few hearths and firepits on the west side. Cooking areas may have been reserved to the east side, with a sleeping area around a warming fire on the west. Sunlight floods the interior of the overhang on the right side early in the morning and may have been a welcome addition around a fire after a cold night.

The single large corner-notched point from Layer 3B at the Redfish site is similar to points of this type found in the Birch Creek Valley at about 7000 BP (Swanson and Bryan 1964) and would seem to indicate the inclusion of Stanley Basin in a cultural tradition exploiting high mountain valleys during the Protoarchaic period in Idaho as well as the earlier period.

The earliest use of the Snake River Plain, as recorded at Wilson Butte Cave (Gruhn 1965:57) and the Wasden Site (Butler 1973c:10) occurred at a time when the glaciated mountain valleys to the north were less hospitable to man. With the onset of ameliorating climatic conditions, ca. 12,000 BP, the mountain valleys became attractive to varieties of game and the hunters who preyed upon them.

Use of the mountain sites was far more intensive than on the Snake River Plain where the regional carrying capacity was lower.

> Almost from the first, the center of population appears to have been in the higher valleys north of the Snake River Plain. Undoubtedly, there were fluctuations in the size of the population in the higher valleys in relation to environmental changes, for the population level probably remained well below the total carrying capacity through all period of time (Butler 1973a:22).

From the bone evidence, it can be assumed that bison were among the primary game on the Snake River Plain and the lower elevations of the long north-south-running valleys to the north. Bison tooth fragments found on the Haskett site at Lake Channel, Idaho leads Butler (1965) to conclude that this was a kill site.

Communal bison hunting may have been practiced on the Snake River Plain as it was in Wyoming at almost exactly the same period in history, ca. 9,800 years ago. Frison (personal communication, 1973) states that, at the Casper Site in eastern Wyoming, over sixty-seven animals were butchered on a one, or possibly two, time use of the site. Communal hunting was probably limited to certain parts of the year, determined largely by bison behavior.

> Between July and October each year the general level of activity within the buffalo herds increases for this is the "Running" or mating season, when the buffalo are most skittish and the bulls most belligerent. After a gestation period of approximately nine months, the cows produce a calf, usually born in the spring (Rorabacher 1970:9).

Skeletons of butchered bison at archaeological sites indicates that late autumnal communal hunts were most common. Possibly small bands of hunters took fewer numbers of animals during other times of the year. The communal hunts were on a large enough scale to warrant some sort of planned organization involving groups or bands of hunters coming together on a seasonal basis (Frison personal communication, 1973).

Big game of the Snake River Plain and the range areas of the western Great Basin were probably pursued by small groups of hunters or by individuals in the spring and early summer when primary production of plant life was highest. Summer activity for these people probably centered in the mountain valleys where the lush meadows would attract migrating game from the plains, as well as elk, deer and mountain sheep. Midsummer months of July and August would provide optimum conditions in the high country where these small groups of nomad hunters could take advantage of natural shelters, like Redfish Overhang, as temporary campsites. A Haskett blank point found at 9,500 ft. elevation in Yellowstone Park, Wyoming, supports the hypothesis of the use of mountain areas for hunting activities (Butler, 1973b).

It would lend weight to the argument of the Redfish site as a camp for big game hunters if the bones of such animals as elk, deer and mountain sheep had been found in the overhang. No bone of any kind was found in the early levels, with the exception of ground squirrel, *Citellus columbianus*, *C. idahoensis*, no doubt intrusive into this area. Bones of a variety of modern mammals were all recovered from more recent deposits. The absence of bone is not remarkable since the sediments are continually damp and not conducive to good preservation.

Other sites in Idaho, however, have produced bones of large game associated with lanceolate projectile points. Butler's (1973a:10) find of a lanceolate point with elephant at the Wasden Site dated 12,900 BP, and the butchered bones of over fifty bison at the same site dated 8,000 BP, indicates the hunting and butchering of large game at an early period. Three archaeological sites in the Birch Creek Valley - Jaguar Cave and the Bison and Veratic rockshelters - have yielded substantial quantities of faunal remains to include mountain sheep, modern bison, antelope, and probably deer and elk (Butler 1968:69). Butler states that 80 percent of the thousands of bones found at Jaguar Cave were mountain sheep. The date for the earliest occupations at this cave is 11,580±250 BP.

In Stanley Basin, the spawning salmon in the river, streams and lakes would have been an additional attraction. Small game could also have been taken. Berries and seeds would have been available, and perhaps camas bulbs were dug. The size and weight of the Haskett tools, the points as well as the heavy scrapers, leads me to propose that the hunters were first of all interested in big game. The other resources were probably of secondary importance.

V. CULTURE COMPLEXES: MODELS AND THEORIES

Paradigms of early culture development in western North America have proliferated in the last two decades. As increasing numbers of archaeological discoveries are reported, there appears to be a drawing together of ideas supporting a widespread culture of early big game hunters contemporaneous with similar cultures on the High Plains east of the Continental Divide. This section presents a brief resumé of some of these paradigms, together with several of different persuasion, as a background to the investigation of Haskett material which is the subject of Chapter VI.

The age of man in the New World has, as yet, not been absolutely determined. Recent dates from archaeological sites at Ayacucho, Peru (MacNeish 1973) project an archaeological sequence lasting 22,000 years. Earliest evidence, so far, for the antiquity of man in Idaho has been found on the Snake River Plain: Wilson Butte Cave with a date of 14,500 BP (Gruhn 1965) and the Wasden Site (Butler 1973a) where butchered elephant bone is dated at 12,800 BP.

There is undoubted evidence for hunters of large mammals, primarily mammoths and extinct bison, 13,000 to 11,000 years ago, using bifacial blades known as Clovis points. The distinctive fluted point of the Clovis assemblage was first identified in sites in Colorado, New

Mexico, Texas, Oklahoma and Arizona (Wormington 1957; Agonino 1968). An extensive fluted point tradition is recognized in western North America with finds reported from California, Nevada, Utah and Idaho, but these surface collections have not been conclusively dated (Butler 1963; Davis 1969; Davis et al. 1969).

Fluted points of the Folsom hunters, which appear to have been adapted largely to bison hunting, are dated between 12,000 to 10,000 BP (Wormington 1957). These points, like the Clovis, have been found in stratified sites east of the Continental Divide, but in scattered surface collections in western states (Tadlock 1966; Tuohy 1968).

Overlapping the late period of Folsom, but spanning a longer time period into the late Pleistocene, are a variety of lanceolate points associated with the hunting of big game (Willey 1966:37). These points were adapted to and developed within a steppe environment of sagebrush-grassland associated with parts of western North America and the Great Plains following the gradual retreat of the boreal forest in the climatic warming trend. The term "Plano" has generally been applied to the lanceolate points utilized by big game hunters of the American High Plains (Willey 1966:4). Recently, Jennings (1968:87) and Butler (1969:41) have used the term "Western Plano" in connection with lanceolate points west of the Continental Divide. This appears to be a satisfactory term. The Haskett points which are the focus of the remainder of this report, fall within the concept of a Western Plano Horizon of Big Game Hunters.

Horizon is used here according to Willey and Phillips (1958:33), as a spatial community represented by cultural traits and assemblages whose nature and mode of occurrence permits assumptions of broad and rapid spread.

Tradition (Willey and Phillips 1958:37) is a primarily temporal continuity represented by persistent configurations in single technologies or other systems of related forms. In this sense, the Haskett material is a tradition.

Models. Models of early western prehistory have been proposed by Butler (1961, 1973a), Daugherty (1962:144-150), Swanson et al. (1964), Wallace (1962), Jennings (1964, 1968) and Bedwell (1970).

Briefly, Butler's Old Cordilleran Culture concept is concerned with a non-specialized hunting-fishing-collecting complex typified by a simple bifacially flaked lanceolate leaf-shaped point, arriving in the Pacific Northwest about 12,000 years ago, subsequently spreading to the Pacific littoral, east into the Northern Rockies and south to coalesce with the early culture of the Great Basin.

Recently, Butler (1973c) has offered another hypothesis of Big Game Hunters dating from ca. 10,500 BP in western North America. This he refers to as a Western Plano Culture.

Daugherty (1962) modifies the Old Cordilleran Culture to a more general Intermontane Western Tradition (11,000 to 8,000 BP) with local or regional adaptations.

The tool kit includes lanceolate points, crescents, blades and scrapers such as those recovered from the Lind Coulee Site in Washington. The Lind Coulee Site is seen as part of a complex of campsites of early hunters whose primary source of food was bison, with some dependence on smaller game animals and waterfowl. The climate was evidently moist with numerous lakes and streams. Related areas include sites in central Oregon, as well as Fort Rock Cave Site. Radiocarbon dates for Lind Coulee are 9,400±940 years BP, and 8,518±460 years BP (Daugherty 1956:256-259).

The Bitteroot Culture Concept proposed by Swanson (Swanson et al. 1964) theorized that culture and environment form a single structure, i.e., culture evolves in response to change in the environment. The excavation of several sites in Birch Creek Valley, north of the Snake River Plain in east central Idaho, resulted in Swanson's hypothesis of the evolution of a hunting-oriented, mountain-based culture, early ancestor to the historic Northern Shoshoni. Lanceolate points were recovered from the lowest levels of occupation.

Wallace (1962) supports a theory of an early hunting tradition from evidence of lanceolate points and tools found on early sites near the pluvial lake terraces of California.

Jennings (1957, 1964, 1968) has associated the early people of the Great Basin with a broad-based subsistence pattern of hunting and gathering adapted to an arid environment which he calls the Desert Culture. The excavation of Danger Cave in western Utah, situated on a promontory above the salt flats of ancient Lake Bonneville, provided the basis for Jenning's theory. A single lanceolate point was found in association with a firepit in the lowest layer of Danger Cave and is dated at 11,000 BP. Jennings broadened the concept to a culture stage "wherein wide exploitation of available species is a diagnostic attribute" (1964:152). His most recent statement (1968:163) is a concern for the broad subsistence base and the concept of efficiency rather than any particular set of tools.

Culture Complexes Which Include Haskett Points. (Figure 15 shows Haskett site distribution) In Nevada and California archaeologists have defined cultures based on lithic materials found primarily near the playas or pluvial lakes of the Pleistocene period. Many of the artifacts are associated with the high strand lines, beaches and sand bars of the ancient lakes and are thought, by inference, to be of considerable antiquity. The Lake Mohave Complex (Campbell et al. 1937) was at first dated by Antevs at ca. 15,000 BP, a date which he later revised to 9,000 BP (Antevs 1952). Warren and DeCosta (1964) obtained a radiocarbon date of 9,690 BP on *Anodonta* shells from a Lake Mohave beach associated with artifacts. Warren and Ore (1971:2559) have since described another Lake Mohave Site at Bench Mark Bay. The limited diagnostic material from this site includes four man-made flakes and a "possible artifact" discovered at one-half to one and one-half feet below the surface. Shells from the site are dated at 10,270±160 BP (Y-2406).

The Lake Mohave Complex, generally associated with Lake Mohave and Silver Lake points and in some cases, Haskett points, crescents and lanceolate bifaces are included in Warren's (1967) San Dieguito Complex, a "generalized hunting tradition so far reported primarily from sites near playas.

> The major question now posed regarding Paleo-Indian manifestations in the western Great Basin are not merely those of cultural identity, but those concerned with working out spatial and temporal relationships among the several cultures and complexes of the Western Lithic Co-tradition of the Far West (Brott 1968). At present, dating of the Nevada Lithic sites is too insecure to determine whether the San Dieguito complex is older than the Lake Mohave, or *vice versa* Tuohy 1968:34-35).

Into this archaeological welter of data, Davis (1968; Davis, Brott and Weide 1969) has plunged the Western Lithic Co-tradition, a concept involving the stone-working characteristics of both the Lake Mohave and the San Dieguito complexes.

Warren and Ranere (1968:9) defined the Hascomat complex based on the lithic material found from a variety of sites in Nevada, Oregon and Idaho. The Sadmat Site, an open surface site above a high beach line of the Lahontan Basin, produced 75 Haskett and Haskett-like points, as well as Lake Mohave specimens, bipointed leaf-shaped and roundbased leaf-shaped points. In addition, various kinds of scrapers, gravers and drills were found with crescents, choppers and cores.

In Oregon, lithic assemblages containing Haskett specimens similar to those from the Sadmat Site have been reported from the Big Spring Site in the Guano Valley (Cressman 1936), Cougar Mountain Cave (Cowles 1959; Layton 1972), Connely Caves (Bedwell 1970) and Coyote Flat (Butler 1970).

Idaho Haskett points are reported from the type station at Lake Channel and American Falls Reservoir (Butler 1964, 1965, 1967), and from the Redfish Overhang. Lanceolate points similar in technology, but different in form, are reported from Birch Creek, the Raft River Valley and the Portneuf River Valley (Butler 1965), Crane Creek and Big Camas Prairie (Butler and Fitzwater 1965).

One Haskett blank specimen has recently been reported from Yellowstone Park, Wyoming (Butler 1973b). This is a surface find from an elevation of 9,500 feet. So far, the Wyoming point is the known eastern extension of the areal range of these points.

In southwestern Utah, Keller and Hunt (1967:55) have described lanceolate points from the Lund Site in the Escalante Valley, situated on a former arm of Pleistocene Lake Bonneville. Lithic materials from the site show close affinities to the Haskett points of southern Idaho, and indicate an economy based on hunting activities.

The terms, Lake Mohave Complex and the San Dieguito Complex, have already been discussed. Warren and Ranere (1968:11) suggested "Hascomat Complex" (from Haskett, Cougar

Mountain and Sadmat sites) to identify the complex. Bedwell (1970:231) has most recently used the term "Western Pluvial Lake Tradition" in connection with those sites which lie within the region of pluvial lake basins extending from Ft. Rock Valley, Oregon at the northern end, along the eastern side of the Cascade-Sierra-Nevada mountain ranges into southeastern Claifornia.

The basis of Bedwell's concept lies in an adaptation to a specific kind of environment, that is, lake, marsh and grassland:

> . . . a general way of life directed toward the complete understanding and exploitation of a lake environment (Bedwell 1970:231).

Bedwell extends this concept to include "somewhat similar" riverine environments on the Columbia Plateau and the Snake River Plain. The time period bracketing this lacustrine adaptation lies between 11,000 and 8,000 years ago, but habitation intensity seems to have been greatest between 10,000 and 9,500 BP based on radiocarbon dates for the Ft. Rock Valley.

Hester accepts Bedwell's Western Pluvial Lakes Tradition with evident relief:

> This would eliminate the confusing array of other designations, all of which seem to refer to similar cultural expressions . . . . The Western Pluvial Lakes Tradition can be defined to include lacustrine-oriented sites of the early span ca. 9,000 - 6,000 B.C. (11,000 - 8,000 BP). Lithic traits consist of Lake Mohave, Haskett (and "Haskett-like"), Cougar Mountain and related lanceolate points, lanceolate points with concave bases (cf. Black Rock Concave Base), to Lind Coulee, crescents (Great Basin Transverse specimens) and possibly, core-blade and burin technolgies (Hester 1973:65).

Hester also states that "certainly there are no data which support the 'Big game hunting' hypothesis." I must disagree with this statement since, aside from the crescents (discussed below), the lithic material which he lists as belonging to various early western cultural complexes, i.e., lanceolate points, blades, choppers, scrapers, drills and awls, are most usually associated with hunting and the preparation of hides of large Pleistocene herd animals (Willey 1966:29).

Cressman (1970:13-14) observes that there is presence of waterfowl in the avian bone remains in the Fort Rock area for this period, but he also indicates that there is evidence of the presence of large herbivores, mostly elk and bison up to about 8,000 years ago. In addition, horse, camel, and bison are documented for the neighboring Summer Lake basin well before 7,000 BP.

The crescent, which Bedwell considers to be one of the distinctive traits of the Western Pluvial Tradition, is a lithic tool whose function has yet to be definitely determined to everyone's satisfaction (Tadwell 1966:662-673; Davis 1969:159). Clewlow (1968:44-48) suggests it was used as a stunning weapon for wildfowl. Butler (1970:38-39), after microscopic examination of 84 crescents from Coyote Flat concluded that wear patterns indicated use as scrapers, knives and gravers. Daugherty (1956:249) proposes its function to be that of a knife. The crescent is associated with playas, lakes, large rivers, coastal areas and islands.

The temporal span of these tools has not been definitely determined. Davis (1969:159) believes they are part of the early assemblage of Clovis and other fluted point traditions. They are considered to be a part of the trait list for the Lake Mohave Complex and of the San Dieguito Complex. Tadwell says that they can be associated either with the big game hunting culture of the Paleo-Indians stage and hence are older than 9,000 BP, or are part of an unidentified combination big-game hunting and food-grinding culture of the Protoarchaic stage, ca. 9,000 - 7,000 BP.

Summary. Despite differing interpretations of archaeological research in the last decade (Jennings 1968; Bedwell 1970; Hester 1973) there appears to be conclusive evidence of an early western hunting culture, designated by various names, but perhaps best conceptualized by the term "Western Plano" indicating a florescence of big game hunting activities. Clovis, followed by other fluted point traditions, preceded the Western Plano horizon. A climatic warming trend precipitated the gradual withdrawl of the depressed forests of the late Pleistocene period, allowing the expansion of a steppe-grassland.

The southwestern region of southern Nevada and southeastern California experienced the effects of the warming trend earlier than areas in more northern latitudes, but generally, a steppe environment prevailed, as indicated by pollen and pluvial lake research. It was not until after 9,000 BP that the pluvial lakes began a major recession, but even then with several noteworthy fluctuations, indicating that the glacial period of the late Pleistocene, while dying, was not yet dead. More precipitation and a return to cooler temperatures occurred at least twice between 9,000 - 7,000 BP. Probably after 8,000 BP it was too late for these fluctuations to influence the environment and after 7,000 BP most of the lakes (Pyramid and Crescent Lakes were two exceptions) were desiccated. The period 9,000 - 8,000 was a time of gradually increasing aridity with decreasing supplies of vegetation, and consequently, of big game on the western fringes of the Great Basin. The Western Pluvial Lakes Tradition concept would have validity during this period, rather than when the grasslands were ubiquitous, the carrying capacity high, and surface water readily available. The lakes would have gradually become increasingly important as a refuge for man and animal alike. Decreased supplies of large game would force greater reliance on smaller mammals, wildfowl and fish; in other words "a general way of life directed toward a complete understanding and exploitation of lake environment." Those groups which did not adapt to the exploitation of lacustrine resources, moved elsewhere. Ecological and population pressures probably forced hunting groups to areas compatible with their way of life (Tadwell 1966:673).

Farther north, on the Columbia Plateau and the Snake River Plain, the effect of the warming trend was less pronounced in the early stages. Big game thrived, as evidenced by the bison kill of over 80 individuals at the Wasden Site dated at 8,000 BP, and other big game remains from Jaguar Cave and Bison and Veratic rockshelters. After 7,500 the Protoarchaic period had begun in the north also. The time of the Plano hunters was over.

VI. COMPARISONS

As part of the methodology for the preparation of this thesis, it was decided that I should make a physical attribute comparison of the Haskett points from Lake Channel and the Redfish Overhang with points called "Haskett" from sites outside of Idaho. The purpose of the research was to determine whether, in fact, the points from different areas are morphologically similar to a degree that it can be stated with certainty that they are products of the same mental template, thus inferring a widespread cultural tradition based upon direct relationships with other regions.

Descriptive literature from sites in Oregon, Nevada, California and Utah have utilized the type name "Haskett" and "Haskett-like" since such nomenclature was first used by Butler in describing the point type in 1965. The discoveries of single-component collections at Lake Channel and the earliest levels at Redfish Overhang, suggest that the Haskett point is a discrete component, useful as a material culture trait and as a marker for a particular cultural tradition. Since the temporal span of Haskett material has been bracketed by Bedwell (1970:184, 232) at 11,000 to 8,000 BP, with a cluster of dates between 10,000 and 9,500 BP, corroborated by the radiocarbon dates from Redfish Overhang (9,860 BP and older than 10,100 BP) this distinctive point type may also be useful as a time marker. In the welter of point types found in association in surface collections from the western Great Basin, it is proposed that the Haskett point will provide a temporal and spatial concept within the big game hunting culture of the western United States.

Although there are many definitions of the term "projectile point type," I use the following definition as the basis for this research:

> . . . a projectile point type is essentially an artificial construct . . . An individual or a group of individuals may feel that certain traits characterize a sufficiently large number of points that a recurring pattern, believed to be culturally significant and delimited in time and space, can be recognized (Wormington 1957:2).

Krieger (1944:272) sees point typologies in terms of behavior patterns which have historical meaning and imply a definite constructional idea. Rouse (1970) urges archaeologists to work not only with the patterns of attributes which are known as types and modes, but to see in them the standards, customs and beliefs of the artisans. Before such interpretation can have validity, it is necessary to establish a firm basis of the artifact indentification.

Haskett Points: Description. Butler (1965:6) has described two types of Haskett points, both found at the Lake Channel site on the Snake River Plain.

Type 1 (Fig. 16a) are broadest and thickest near the distal end and have a long, edge-ground basal section, tapering to a narrow, relatively thin butt (0.4 cm thick) which varies from straight to convex. The basal section accounts for approximately 60 percent of the length of the point. Specimens are bifacially flaked and lenticular in cross-section. They appear to have been shaped by either pressure or by indirect percussion flaking. (Crabtree <u>in</u> Warren and Ranere 1968:14 indicates percussion flaking). Primary flake scars are broad and shallow, feathering out at or near the mid-line of either face in a collateral fashion. The medial line is relatively straight and rather pronounced.

<u>Type 2</u> (Fig. 16b) are considerably longer and heavier than Type 1. The blade and basal sections are of approximately equal length and are widest at the midpoint section. Flaking technique is the same as Type 1, that is, parallel collateral. Type 2 is edge ground from the butt to the mid-section.

Measurements of the Haskett points from the Lake Channel Site and of the Redfish specimens are shown in Figure 17.

Dr. Kenneth Faler, Department of Chemistry, Idaho State University, Pocatello, compiled the measurements for the Lake Channel specimens. (Butler 1965, Table 1:10). He notes physical proportions of the points remain constant to a surprisingly predictable degree, notably the flare, or widest and thickest part of the point, at almost exactly two-thirds of the length of the total point. (Faler personal communication, 1972) Morphologically, there is little range in form, but more so in size as can be seen in the finished point from Redfish, 5.9 cm in length, as compared to the average length of the Lake Channel specimens Type 1 at 10.7 cm.

Materials include cryptocrystaline, obsidian, ignimbrite, quartzite, and rhyolite.

Crabtree (personal communication, 1973) notes the particularly strong construction, without channeling, of the Haskett points and observes that the entire thick and sturdy basal portion was hafted, backing the wide sharp blade. He speculates that these points were most likely mounted on short spears, and that the method of attack may have been by means of repeated stabbing on either side of the animal under the ribs and finally back of the atlas vertebra.

Frison (personal communication, 1973), who also examined the points suggests that they may have been hafted on a shaft which was socketed into the end of a short spear, similar to a specimen of another point type found at Spring Creek, Wyoming. The hunter could then carry a ready supply of hafted points to replace those lost or broken in the process of the hunt.

<u>Lake Channel Site: The Type Station</u>. The Lake Channel Site was discovered in 1963 by Mr. Parley Haskett, an amateur collector who brought it to the attention of Butler (1965). The site is located eight miles southwest of American Falls Reservoir on the Snake River Plain near a temporary run-off channel formed during a short-lived, but

catastrophic flood of Pleistocene Lake Bonneville. The Plain is underlaid by basalt flows, forming a subprovince of the High Lava Plains of the Columbia Plateau. The flood apparently swept away the unconsolidated sediments covering the basalt, which were then replaced by dune fields. The site, located in the dune field, was dated by Butler at 7,000 BP on geologic evidence. Firm dating of the Redfish Haskett material allows inference of a much earlier date, probably between 9,500 and 10,000 years ago.

Over the two year span of the excavation, 8 points, 2 point fragments (Fig. 15) and 33 flakes were found in the dunes and in the eroding surface of the site. Bison tooth fragments, found in the vicinity of the artifacts, led Butler to suggest that this had been a kill site.

Among the flakes, one black chert specimen displays well struck burin scars (Fig. 11b). Examination under a microscope reveals definite signs of wear on the upper end. Such small burin tools are recognized as a part of a widespread core and burin technology (Epstein 1963; Tuohy 1969).

It is particularly noteworthy that the Lake Channel Site is not a multi-component site, nor were points of other types found with the Haskett material at Redfish Overhang, nor with the surface find at Yellowstone Park.

Haskett points and point fragments, two large side scrapers, a composite tool, the microblade, plus miscellaneous flakes compose the assemblage from the three collections.

Comparison of Haskett Points From Different Areas. In order to verify the reported similarities between the projectile points, tentatively called "Haskett", reported from various archaeological sites in the West, I asked permission to examine collections from sites in Oregon and Nevada. No rigorous controls were exercised over measuring of the artifacts from other areas, although a comparison of this sort should prove illuminating and is suggested for future research. Instead, I based my examination strictly on point morphology. The result of detailed point comparisons are presented here, corroborated by the opinions of professional archaeologists who examined the various points with me. Time and funds did not allow me to travel to California to view collections there. While the conclusions from this research must be based on those collections which I actually examined, I include Amsden's description of the points he called "leaf-like blades," and the reader is referred to the illustrations in the Lake Mohave report (Campbell et al. 1937, Plate XL, LIb).

> . . . the form (is) well nigh perfect in most of them. They suggest hafting in general contour, and careful examination reveals more painstaking thinning and sharpening at the tip than at the butt. The homogeneity of material is surprising; one . . . is of dull obsidian, all the others of chert or quartzite with one exception, which is of jasper. I shall not say what form of implement they represent. In shape they suggest a projectile point, but the size of many seems rather large unless we assume the use of a lance or hand-spear . . . the longest of ours measure 11 cm. With a maximum thickness of only 9 mm it is remarkably light for its size and probably could have been used successfully with the dart-thrower or

> atlatl. This specimen shows a pressure retouch that is neat and painstaking, although not very regular. The group as a whole testifies to high skill at percussion work and little regard for the niceties of pressure retouch. But the materials do not lend themselves to fine workmanship. The general form is common enough, recalling its Solutrean "laurel leaf" prototype, but I find no specific resemblances to cite. Curiously enough, Sollar's illustration (fig. 271) of a true Solutrean blade, with its suggestion of a shoulder, is much like ours.

<u>Oregon Haskett Collection</u>. Specimens from Bedwell's collection recovered from the Connely Caves in Ft. Rock Valley and Cressman's collection of fragments from the Big Spring Site in the Guano Valley, were examined and compared to the Idaho points. In form and technology, the ten points were found to be very similar, some examples almost mirror images (Fig. 19). Mr. David Cole, Acting Director, Museum of Natural History, University of Oregon, Eugene, observed that, with some exceptions, the material from both areas appears to be identical. Mr. Cole was kind enough to photograph the collections together. Dr. John Fagan, Acting Assistant Curator of the Museum of Natural History, who was working on the Ft. Rock collection at the time of my visit, also indicated direct similarities among the points.

In reference to the temporal span for Haskett points in the Fort Rock area and Bedwell's "Unit 3" in which 90 percent of the Haskett specimens are found, Cressman (1970:16) notes that this period presents a picture of the development of techniques and specimens:

> There is improvement in workmanship (from the preceding period) and modification of point types, apparently in the interest of improved hafting, as though they were experimenting with solutions to this problem.

Bedwell (1970:118) refers to Haskett points from the Connely Caves as "Type P2" and describes them as follows:

> Form: Long elliptical, non-stemmed and non-notched increasing in width away from a rounded base for about two-thirds of its length, contracting therefore sharply at the point. Moderately thick cross-section smoothly lenticular in shape.
>
> Flaking technique: Wide, long, fairly uniform flake scars of about the same dimensional proportion running at right angles to and generally crossing the midline. Flake pattern regular and well controlled. General appearance is that of uniform percussion flaking. Edge grinding present on most specimens.

He further states:

> Turning eastward to the Snake River Plain of Idaho, similarities are seen with the Haskett site (Butler 1965). The projectile point form known as the Haskett point closely resembles the Type P2 projectile point from the Connely Caves (Unit 3). Although there are few other artifacts as yet associated with the Haskett finds to be compared with the Fort Rock assemblage, the similarity between the Haskett point and the P2 point is so marked in form and flaking technique, as confirmed by Butler and Crabtree, that there is little doubt that a cultural relationship must have existed between the two areas at some point in time.

In light of the above, it seems evident that the Haskett material from Idaho and that from the Oregon sites is a concrete manifestation of a single cultural expression.

<u>Nevada Collection</u>. Haskett points from Nevada sites were examined at the Museum of Natural History, Carson City. Fortunately, many of the specimens from the Sadmat Site where

75 Haskett points were found, part of a private collection usually housed elsewhere, were in the museum for photographing. Mr. Donald Tuohy, Curator for Anthropology at the museum, studied the collection with me. Again, the Lake Channel and Redfish Haskett points were directly compared with those from other sites. (Fig. 20)

Haskett points from the following Nevada sites were included: Brady's Hot Springs, Mud Lake, Lake Tonopah, the Coleman Site, Hathaway Beach, Sadmat and Long Valley. Following the comparisons of the various Haskett points, Tuohy stated that in his opinion there could be no doubt that the Idaho and Nevada Haskett material are a product of the same tradition.

Tuohy sees a basic relationship underlying several large lanceolate types which have been identified with big game hunting; namely, Haskett, the Hell Gap point, Style I Lind Coulee, Cougar Mountain Cave points and the "leaf-like blades" which Amsden describes, as well as the Lake Mohave points and the Silver Lake series, with the Lake Mohave point basic to them all.

> Perhaps for example, we should speak of a "Haskett" variant, or a "Lind Coulee Style I" variant in the Lake Mohave series . . . . It is clearly evident that before too much time passes this identification problem will have to be resolved (Tuohy 1969:137).

Without betraying the purpose of this thesis, which is to establish the usefulness of the Haskett points as a distinctive identifiable culture trait in time and space, its relation to other point types cannot be denied, in fact, should be encouraged. The identification problem will be a continuing concern as long as archaeologists working in the western Great Basin focus their concentrated attention on the pluvial lake terraces to the exclusion of more revealing stratified sites in the mountains. Davis (1968:47) has already suggested that such sites should be found in the mountains adjacent to the plains.

> I need scarcely repeat that dates are conspicuous by their scarcity in the Mohave Desert, at least for archaeological materials. I would like to suggest a new approach to this problem: to begin to date the two dimensional desert sites by escaping from them into adjacent mountains. Since the same diagnostic point/knives occur in both playa and mountain environments, it is obvious that Paleo-Indians used them both. Therefore, we should try excavating at mountain sites near grasslands, bog-meadows, and springs. Here, both deposition and erosion would be less than on desert floors, pollen should be preserved as well as other organic materials, and our chances of recapitulating datable sequences should be better (Davis 1948:47).

Study of the re-use of projectile point and knife fragments to make burins, gravers, scrapers and smaller points was an important part of the lithic analysis at both Tonopah and Sadmat sites. Comparison was made of the burins and microtools from the Smith Creek site (Bryan 1972) considered to be part of the Lake Mohave Complex, located in White Pine County, eastern Nevada, with those from Lake Channel, Idaho (Fig. 10b). Tuohy (1969:139), projects the hypothesis of the re-use and conservation of broken tools and points as part of the micro-blade industry associated not only with the long-stemmed Mohave and Silver Lake assemblages, but agrees with Epstein (1963:199) that burin facets have a broad range of distribution in many areas of North America.

Comparison with other Point Types. Since the comparisons of Haskett points had proved to be useful on the west side of the Continental Divide, it was decided to make further comparisons with lancolate points of an early period east of the Rocky Mountains to determine whether relationships might be extended in that direction.

Butler had shown a Type 1 Haskett specimen to Dr. Marie Wormington in 1965, and she had observed that there appeared to be some similarity between it and Agate Basin points in form, but a difference in flaking technology. Tuohy (1969) noted similarities between long stemmed Lake Mohave points (including Haskett) and Hell Gap points, as mentioned above. My purpose was to compare the Haskett points from Idaho with examples of these two point types, (Fig. 21) as well as to look through collections representative of typologies found on the High Plains to see what similarities, if any, could be found.

As a result, I visited Dr. Wormington at her home in Denver, Colorado where she had a collection of Agate Basin points and associated artifacts.

Agate Basin points were first reported from eastern Wyoming in 1943 by Frank H. H. Roberts. In 1959 Agonino (1970) and Frankfurter excavated a site at Brewster, Wyoming, where the points were found in association with extinct bison, Bison antiquus, dated at 10,000 BP. Other sites have been reported from Hot Springs, South Dakota, and Blackwater Draw, New Mexico. Agonino sees them chronologically nearly as old as Folsom and at some sites this type overlies the Folsom-Midland Complex.

When the Haskett points were placed next to the Agate Basin points, both the similarities and differences became immediately apparent. Attributes which had seemed very alike in illustrations, especially photographs, were seen to be quite dissimilar in actual comparison.

In form, the Agate Basin points tend to have more parallel to convex sides without the noticeably wider blade of the Haskett. Agate Basin specimens are usually widest at mid-point and thinner in cross-section than Haskett. Both show collateral parallel flaking, but the thinner ribbon-like primary flakes of the Agate Basin contrast to the broad shallow flakes of the Haskett. Agate Basin appears to have delicate carefully applied pressure flaking, while Haskett shows a broad percussion flake removal. Wormington remarked that the two types would seem to share a relationship, possibly growing out of a remote common ancestor.

As I departed Denver for Laramie, Wyoming, Dr. Wormington suggested that I would find more similarities between Haskett points and Hell Gap points. Dr. Frison, Professor of Anthropology, University of Wyoming, Laramie, took one look at the Haskett specimens and remarked, "I think they look more like Agate Basin points than Hell Gap!"

The most obvious difference between the Haskett and Hell Gap points lies in the defined wide parallel stem and slight shoulder at mid-point of the latter. They are widest at mid-point in contrast to Haskett, and they tend to be thinner in cross-section. Hell Gap demonstrate a carefully prepared preform bearing wide percussion flaking by a well controlled soft hammer technique. The only modification, then, is pressure retouch and grinding which extends to the shoulder from the base. (Frison personal communication, 1973) There appears to be extensive preparation of the base in Hell Gap points. While Haskett is thinned by transverse flakes at the butt, Hell Gap shows tiny nibbled longitudinal thinning flakes. Reworked Hell Gap points tend to look much more like Haskett points since in these the shoulder has been obliterated. Frison expressed a feeling of basic relationship between the two point types and suggested that in the range of variation which could be expressed in a large sample, the extremes of the sample would probably overlap.

The Hell Gap collection at the University of Wyoming is from the Casper Site in the eastern part of the state. This was a bison kill site, used only once or twice, where at least 67 animals were butchered. Hunters evidently drove the bison over parabolic dunes, forming natural traps, on the uppermost terrace of the North Platte River. Frison observes that dunes provide a prime situation for attracting and trapping the animals since feed and water are abundant and soft sand slopes, lying at a high angle of repose, offer maximum impeding factors to large split-hoofed herbivores. The site has a C-14 date of 9,780±500 BP (Frison personal communication, 1973).

The Redfish cache is dated at 9,860 BP and, by inference, the Lake Channel Site at the same time. It is a point of interest that bison were hunted in sand dunes on both sides of the Continental Divide (at the Casper Site in Wyoming and at the Haskett Site in Idaho) ca. 9,800 years ago.

In addition to the collections discussed above, I examined the various collections at the Museum of Natural History at the University of Colorado, Boulder. Nothing which I saw in the more than 200 drawers and cases of the site and survey material resembled the Haskett points, nor did any of the staff members at the museum recall seeing points of the same form and technology from that area.

Dr. Joe Ben Wheat, Curator of the Museum at Boulder, was absent during my visit, but later in May, 1973, spent several days at Idaho State University while I was writing this thesis. Dr. Wheat inspected the Haskett collection, expressed admiration for the skillful craftsmanship, and agreed that the points had probably been used in pursuit of big game.

Several comparisons with other collections were made and should be briefly mentioned. Since my concern was to pinpoint as nearly as possible the areal distribution of the Haskett points, I felt that I should follow every possible lead to investigate reported point specimens which appeared to have characteristics significantly like those of the Haskett material.

Dr. Frison had suggested that I examine a private collection of artifacts in Jackson Hole, Wyoming, belonging to Mr. Slim Lawrence, who owns a small museum housing a collection of artifacts found on an extensive campsite near Jackson Lake. Archaeological evidence (Frison 1971; Love 1972; Wright 1972) suggests that the prehistoric occupation of Jackson Hole on an annual seasonal basis, extends back to ca. 9,000 - 8,500 BP and appears to be related to the Agate Basin horizon. The Lawrence collection includes early prehistoric point types, but none of the material which was shown to me appeared to be related to the Haskett type. A possible exception was a collection of several large ovate bifaces which somewhat resembled those from the cache at Redfish Overhang.

One last specimen was examined. This was a point from the Pine Spring Site in southwestern Wyoming (Sharrock 1966 Fig. 35h) included in the collection housed at the Museum of Natural History, University of Utah, Salt Lake City. While the illustration looked rather promising, actual comparison of the point to the Haskett type proved it to be quite different.

VII. CONCLUSIONS AND IMPLICATIONS

In terms of the originally stated objectives of this thesis, it is felt that some degree of success has been achieved.

1. Redfish Overhang, its geographic setting, environment, the excavation of the site and analysis of early cultural material have been presented. The Overhang is seen as an addition to the known Haskett sites and provides a new dimension to the areas and resources exploited by the people who made Haskett points.

2. The comparison made of Haskett points from Idaho, Oregon and Nevada have been discussed. Professional archaeologists, familiar with the point type, have been asked to compare the Idaho points with those from other collections and offer opinions as to whether these points can be considered products of the same cultural tradition. The Idaho Haskett points have been compared with other types in areas east of the Continental Divide. Similarities and differences have been discussed.

3. The discussion presented in this thesis suggests a hypothesis which should be testable and provide a base for future research: early hunters, characterized by lanceolate projectile points such as Haskett points, utilized a pattern of seasonal transhumance. This pattern allowed

them to exploit the available resources, primarily large game, to be found on the grassland steppe which characterized the High Lava Plains and the western Great Basin in the late Pleistocene period, and alternatively, to exploit the large game available in high mountain valleys and highlands during those months of the summer when these valleys provided pasture attracting elk, deer, and mountain sheep. Rock-shelters and overhangs, such as Redfish, are obvious habitation sites, but, as Davis (1968:47) suggests, open sites in the mountains should provide valuable information as well.

Davis's suggestion is an admirable one and is heartily endorsed. While each new archaeological site found on a playa terrace is of interest and importance, it would seem worthwhile to locate mountain sites in the Cascades and Sierra Nevada mountain ranges, as well as the many long north-south running ranges bordering the playas throughout the Great Basin. If Haskett, Lake Mohave, Silver Lake and other point type specimens are found in stratified sites, perhaps with the bones of some kind of game, the arguments about comparative antiquity and resource exploitation might be resolved. The very narrow and biased view of man seen from the playa could be expanded to include the whole subsistence round.

Absolute dating of the Haskett cache at the Redfish Overhang supports the temporal span reported by Bedwell (1970:232) for this point type found in the Connely Caves of Fort Rock Valley, Oregon. Bedwell suggests a period of

11,000 - 8,000 BP for the manufacture of the Haskett points. His earliest date for Haskett points is 10,600 BP. One Haskett point fragment from the Redfish Overhang is, by stratigraphic position, of about the same age. Bedwell further suggests that the greatest concentration of Haskett material lies between 10,000 and 9,500 BP. The date for the Redfish cache, 9,860 BP, fits well into this suggested period. Based on the above dates the Haskett point type should serve as a useful time marker among the early western cultural traditions.

In comparing the Haskett material with lanceolate points of Plano culture east of the Continental Divide, specifically, Agate Basin and Hell Gap points, some resemblances are seen. The Hell Gap points and the Haskett points are somewhat similar in form and flaking technology, but the more parallel stem and slight shouldering of the Hell Gap points tend to differentiate the two types.

Agate Basin points are seen to be less similar in flaking technique, with narrow ribbon-like parallel collateral flakes in contrast to the Haskett wide expanding flake scars. The outline form is perhaps closer to Haskett than Hell Gap, but in both instances the widest part of the point is about half way between the distal and butt ends, whereas the Haskett point is distinguished by its flare at two-thirds of its length above the tapered stem, giving it a distinctive and characteristic outline.

Both Dr. Marie Wormington and Dr. George Frison, who inspected the points suggested a basic relationship between Haskett and the other two, more remote in the case of the Agate Basin than with the Hell Gap. All three types are associated with bison hunting, Agate Basin slightly predating the other two. On the basis of this comparison, the areal range of Haskett points is seen to entend eastward only as far as northwestern Wyoming in Yellowstone Park. The entire areal range based upon present information includes northwestern Wyoming, the Snake River Plain in Idaho, as well as one known alpine site at Redfish Overhang, the High Lava Plains of southcentral and eastern Oregon, the basin and range areas of Nevada, southwestern Utah and southeastern California.

Present environmental conditions of the Stanley Basin have been presented. Reconstruction of the late Pleistocene environment has also been presented in some detail, since this was the period when hunters using the Haskett points have been determined to exploit the resources of the Stanley Basin. The cooler, moister condition of the area following the deglaciation 12,000 years ago would have encouraged the growth of a heavy coniferous forest. With the gradually ameliorating climate, open parklands expanded and large grazing mammals such as elk, deer and mountain sheep, would have utilized the summer meadows of the Basin.

The presence of a buried B soil horizon just beneath the upper level of the Haskett material correlates with other weakly developed paleosols of the Northern Rocky Mountains (Richmond 1965). Some climatic inference can be made since soil development requires conditions in which a weathering process can take place. Some degree of stability and warmth is implied. Increased moisture and cold accompanying the Valders Advance after 10,000 BP were not sufficient to interfere with the use of Stanley Basin and the Redfish Overhang as evidenced by numerous hearths, but little diagnostic material in Layer 3B. Limited chipping detritus, one projectile point very like a Silver Lake type, from the vicinity of a hearth dated at 8,060 BP, and one large side-notched point comprises the cultural material.

On the basis of only the two single point type specimens, it is difficult to characterize the cultural use of Redfish Overhang subsequent to the Haskett occupation. Silver Lake points are a common trait of the Lake Mohave Complex. Only one other specimen has been reported in Idaho, and its identification is questionable. As has been suggested, the appearance of this point at a later period than the Haskett may have some significance for the chronology of multicomponent sites elsewhere.

The single large corner-notched point is similar to points of this type found in the Birch Creek Valley at about 7,000 BP (Swanson and Bryan 1964) and may indicate the inclusion of Stanley Basin in a cultural tradition exploiting high mountain valleys during the Protoarchaic period in eastern Idaho.

No bones of Pleistocene or modern animals were found in the earlier layers of this site. The size of the preforms, blanks and lanceolate points, in addition to the large heavy scrapers strongly suggest that this was a hunting camp. Other resources than game may have been utilized since anadromous fish are found in the river, lakes and streams. Probably berries, seeds and forbs were available as well.

The view from Redfish Overhang, hopefully, presents another facet to the Haskett hunters in western North America which will add perspective in the attempt to reconstruct cultural patterns 10,000 years ago.

BIBLIOGRAPHY

Agonino, G.

1961 A new point type from Hell Gap Valley, eastern Wyoming. American Antiquity 26:4:558-560.

1968 A brief history of man in the western High Plains. In Early Man in Western North America, edited by C. Irwin-Williams. Eastern New Mexico University Contributions in Anthropology 1:4:1-5.

1970 Occasional, purposeful fluting of Agate Basin points. Paper presented at Meeting of New Mexico Academy of Science, Hobbs.

Ambro, R. D.

1967 Dietary-technological-ecological aspects of Lovelock Cave coprolites. University of California Archaeological Survey Reports 70:37-48.

Antevs, E.

1948 Climatic changes and pre-white man. University of Utah Bulletin 38:20:168-191.

1952 Climatic history and the antiquity of man in California. University of California Archaeological Survey Reports 16:23-31.

1955 Geologic-climatic dating in the West. American Antiquity 20:4:317-335.

Arnold, J. F., and W. F. Megahan

1964 Sawtooth Mountain area study. Idaho soils and hydrology. U.S. Forest Service, Ogden, Utah.

Aschmann, H. H.

1958 Great Basin climates in relation to human occupance. In "Current views on Great Basin archaeology," University of California Archaeological Reports 42:23-40.

Baker, R.

1970 Pollen sequence from late Quaternary sediments in Yellowstone Park. Science 168:1449-1450.

Baumhoff, M. A., and R. F. Heizer

1965 Postglacial climate and archaeology in the desert west. In The Quaternary of the United States, edited by H. E. Wright, Jr. and D. G. Frey, pp. 697-707. Princeton University Press, Princeton.

Bedwell, S. F.

1970 Prehistory and environment of the pluvial Fort Rock Lake area of south central Oregon. Ph.D. dissertation, University of Oregon. University Microfilms, Ann Arbor.

Binford, L. R.

1962 Archaeology as anthropology. American Antiquity 28:2:217-225.

1965 Archaeological systematics and the study of culture process. American Antiquity 31:3:203-210.

Blackwelder, E.

1915 Post-Cretaceous history of the mountains of central Wyoming. Journal of Geology, Part III. 23:307-340.

Bowers, A. W.

1964 Sawtooth Mountain study area. Archaeological reconnaissance. National Park Service, Western Region, Moscow, Idaho.

Bright, R. C.

1966 Pollen and seed stratigraphy of Swan Lake, southeastern Idaho. It's relation to regional vegetational history and to Lake Bonneville history. Tebiwa 9:2:1-47.

Broecker, W. S., and A. Kaufman

1965 Radiocarbon chronology of Lake Lahontan and Lake Bonneville II, Great Basin. Geological Society of America Bulletin 76:5:537-566.

Bryan, A. L.

1972 Summary of the archaeology of Smith Creek and Council Hall caves, White Pine County, Nevada. Reporter, Nevada Archaeological Survey, Nevada State Museum.

Bryan, A. L., and R. Gruhn

1964 Problems relating to the Neothermal climatic sequence. American Antiquity 29:3:307-315.

Butler, B. R.

1961 The Old Cordilleran culture in the Pacific Northwest. Occasional Papers of the Idaho State College Museum 5.

1962 Contributions to the prehistory of the Columbia Plateau. Occasional Papers of the Idaho State College Museum 9.

1963 An early man site of Big Camas prairie, south-central Idaho. Tebiwa 6:22-34.

1964 A recent early man point find in southeastern Idaho. Tebiwa 7:1:39-40.

1965 A report on investigations of an early man site near Lake Channel, southern Idaho. Tebiwa 8:2:1-20.

1967 More Haskett points from the type locality. Tebiwa 10:1:25.

1968a A guide to understanding Idaho archaeology. Idaho State University, Pocatello.

1968b An introduction to archaeological investigations in the Pioneer basin locality of eastern Idaho. Tebiwa 11:1:1-30.

1969 The earlier cultural remains at Cooper's Ferry. Tebiwa 12:2:35-41.

1970 A surface collection from Coyote flat, southeastern Oregon. Tebiwa 13:1:34-58.

1971 A bison jump in the upper Salmon River valley of eastern Idaho. Tebiwa 14:1:1-32.

1973a The evolution of the modern sagebrush-grass steppe biome on the Snake River plain. Paper presented at 38th Annual Meeting, Society for American Archaeology. San Francisco.

1973b Folsom and Plano points from the peripheries of the upper Snake country. Tebiwa 16:1:69-72.

1973c The prehistory of the upper Snake country, an article prepared for The Handbook of North American Indians, January 1973 to be published by the Smithsonian Institution.

Campbell, E. W. C., W. H. Campbell, E. Antevs, C. A. Amsden, J. Barbieri and F. D. Bode

1937 The archaeology of Pleistocene Lake Mohave. Southwestern Museum Papers 11, Los Angeles.

Casebeer, R., and D. K. Dunham

1964 Sawtooth Mountain area study, Idaho. Fish and wildlife. U.S. Forest Service and National Park Service, Study Report 4.

Cheatum, E. P., and D. Allen

1962 Limitations in paleoecological reconstruction utilizing data from fossil non-marine molluscs. In The reconstruction of past environments, Proceedings of the Fort Burgwin Conference on Paleoecology 3. Fort Burgwin Research Facility, New Mexico.

Clewlow, C. W., Jr.

1968 Surface archaeology in the Black Rock desert, Nevada. University of California Survey Reports 73:1-93.

Coale, G.

1956 Archaeological survey of the Mt. Sheep and Pleasant Valley reservoirs. Davidson Journal of Anthropology 2:1:10-30.

Cowles J.

1959 Cougar Mountain cave in south-central Oregon. Private publication. Ranier, Oregon.

Crabtree, D. and B. R. Butler

1964 Notes on experiment in flint knapping, Tebiwa 7:1:1-3.

Cressman, L. S.

1936 Archaeological survey of the Guano valley region in southeastern Oregon. University of Oregon Monographs, Studies in Anthropology 1:1-48.

1942 Archaeological researches in the northern Great Basin. Carnegie Institution of Washington, Publication 538.

1944 Reply to A. D. Krieger's review of L. S. Cressman's archaeological researches in the northern Great Basin. American Antiquity 10:2:206-211.

1970 Fort Rock report. Paper presented at the Northwest Anthropological Conference, Oregon State University, Eugene.

Curray, J. R.

1965 Late Quaternary history, continental shelves of the United States. Edited by H. E. Wright, Jr. and D. G. Frey, In The Quaternary of the United States. Princeton University Press, Princeton.

Daubenmire, R. F.

1943 Vegetation zonation in the Rocky Mountains. Botanical Review 9:325-393.

Daugherty, R. D.

1956 Archaeology of the Lind Coulee site, Washington. Proceedings of the American Philosophical Society 100:3.

1962 The intermontane western tradition. American Antiquity 28:2:144-150.

Davis, E. L.

1963 The desert culture of the western Great Basin: a lifeway of seasonal transhumance. American Antiquity 29:202-212.

1967 Man and water at Pleistocene Lake Mohave. American Antiquity 32:3:345-353.

1968 Early man in the Mohave Desert. In Early man in western north America, edited by C. Irwin-Williams, Eastern New Mexico University Contributions in Anthropology 1:4:42-47.

1969 Recent discoveries of fluted points in California and Nevada. Anthropological Papers, Nevada State Museum, 14:154-169.

Davis, E. L., C. W. Brott and D. L. Weide

1969 The western lithic co-tradition. Museum of Man Papers 6, San Diego.

Davis, R. J.

1952 Flora of Idaho. Dubuque: W. C. Brown Co.

Davis, W. B.

1939 The recent mammals of Idaho. Caldwell: Caxton Printers.

Dilthey, W.

1883 Einleitung in die Geisteswissenschaften. Duncher and Humboldt, Leipzig.

1959 The understanding of other persons and their life-expressions. In Theories of history, edited by P. Gardiner. Free Press, New York.

Epstein, J. F.

1963 The burin-faceted projectile point. American Antiquity 29:2:187-201.

Fenneman, N. M.

1931 Physiography of Western United States. McGraw-Hill. New York and London.

Ferris, W. A.

1940 Life in the Rocky Mountains. A diary of wanderings on the sources of the rivers Missouri, Columbia, and Colorado from February, 1830 to November, 1835, edited by P. C. Phillips. Fred A. Rosenstock, Denver.

Flannery, K.

1967 Review of An introduction to American archaeology, Vol. 1: North and Middle America by G. R. Willey. Scientific American 217:119-122.

Flint, R. F.

1971 Glacial and Quaternary geology. John Wiley and Sons. New York.

Frison, G. C.

1971a Buffalo pound in northwestern plains prehistory. American Antiquity 36:1:77.

1971b Prehistoric occupations of Grand Teton National Park. Naturalist 22:34-37.

Frye, J. C., and H. B. Wellman

1960 Classification of the Wisconsinian stage of the Lake Michigan glacial lobe. Illinois State Geological Survey, Circular 285, Urbana.

Fryxell, R.

1963 Late glacial and postglacial geological and archaeological chronology of the Columbia Plateau, Washington State University, Laboratory of Anthropology Report of Investigations 23.

1965 Mazama and Glacier Peak volcanic ash layers. Relative ages. Science 147:3663:1288-1290.

Fryxell, R., and R. Daugherty

1963 Late glacial and post glacial geological and archaeological chronology of the Columbia Plateau, Washington. Washington State University, Laboratory of Anthropology Report of Investigations 23.

Gale, B. T., and G. R. Plumb

1964 Sawtooth Mountain area study, Idaho. Geology and minerals. U.S. Forest Service and National Park Service.

Gallagher, J.

1973 M.A. thesis in preparation, Department of Anthropology, Idaho State University.

Goodwin, V. O., and J. A. Hussey

1965 Sawtooth Mountain area study: History. United States Forest Service and National Park Service, Ogden, Utah.

Grosscup, G. L.

1956 Archaeology of the Carson Sink area. University of California Archaeological Survey Reports 33:58-64.

Gruhn, R.

1961 The archaeology of Wilson Butte cave, south-central Idaho. Occasional Papers of the Idaho State College Museum 6.

1965 Two early radiocarbon dates from the lower levels of Wilson Butte Cave, southcentral Idaho. Tebiwa 8:2:57.

Guilday, J.

1969 Small mammal remains from the Wasden site (Owl Cave), Bonneville County, Idaho. Tebiwa 12:1:47-57.

Hansen, H. P.

1944 Postglacial vegetation of eastern Washington. Northwest Science 18:4:79-86.

1946 Early man in Oregon. Pollen analysis and postglacial climate and chronology. Scientific Monthly 62:1:52-62.

1947a Postglacial vegetation of the northern Great Basin. American Journal of Botany 34:2:164-171.

1947b Postglacial forest succession, climate and chronology in the Pacific Northwest. Transactions of the American Philosophical Society 37:1.

1951 Pollen analysis of peat sections from near the Finley site, Wyoming. In Early man in Eden Valley, edited by J. H. Moss. Monograph of the University Museum, University of Pennsylvania.

Haury, E. W.

1950 The stratigraphy and archaeology of Ventana Cave, Arizona. University of Arizona Press, Tucson.

Hayes, G. L.

1941 Influence of attitude and aspect on daily variations in factors of forest fire dangers. United States Department of Agriculture, Circular 591:1-39.

Haynes, V.

1962 The geologists role in Pleistocene paleoecology and archaeology. In The reconstruction of past environments, edited by J. J. Hester and J. Schoenwetter. Proceedings of the Fort Burgwin Conference on Paleo-ecology 3. Fort Burgwin Research Center, New Mexico.

Hester, J. J. and J. Schoenwetter (Editors)

1964 The reconstruction of past environments, Proceedings of the Fort Burgwin Conference on Paleoecology 3. Fort Burgwin Research Center, New Mexico.

Hester, T. R.

1972 Ethnographic evidence for the thermal alteration of siliceous stone. Tebiwa 15:2:63-65.

1973 Chronological ordering of Great Basin prehistory. University of California Archaeological Research Facility, Contributions 17.

Huesser, C. J.

1960 Late-Pleistocene environments of north Pacific North America. American Geographic Society Special Publication 35.

1965 A Pleistocene phytogeographical sketch of the Pacific Northwest and Alaska. In The Quarternary of the United States, edited by H. E. Wright and D. G. Frey, pp. 469-483. Princeton University Press, Princeton.

Hopkins, D. M.

1963 Geology of the Imuruk Lake area, Seward Peninsula, Alaska. U.S. Geologic Survey Bulletin 1141-C.

Irving, W.

1961 The adventures of Captain Bonneville, U.S.A., in the Rocky Mountains and the Far West, edited by E. W. Todd, University of Oklahoma Press, Norman.

Jennings, J. D.

1957 Danger Cave. University of Utah Anthropological Papers 27.

1964 The Desert West. In Prehistoric Man in the New World, edited by J. D. Jennings and E. Norbeck, pp. 149-174. The University of Chicago Press, Chicago.

1968 Prehistory of North America. McGraw-Hill, New York.

Keller, G. N., and J. D. Hunt

1967 Lithic materials from Escalante Valley, Utah. University of Utah Anthropological Papers 89:15-18.

Krausser, P.

1968 Dilthey's revolution in the theory of the structure of scientific inquiry and rational behavior. The Review of Metaphysics 22:2:86:262-280.

Krieger, A. D.

1962 The earliest cultures in the western United States. American Antiquity 28:2:138-143.

1964 Early man in the New World. In Prehistoric man in the New World, edited by J. D. Jennings and E. Norbeck, pp. 23-81. University of Chicago Press, Chicago.

Kushner, G.

1970 A consideration of some processual designs for archaeology as anthropology. American Antiquity 35:2:125-132.

Layton, T. N.

1972 Lithic chronology in the Fort Rock Valley, Oregon. Tebiwa 15:2:1-21.

Leopold, E. B.

1962 Reconstruction of Quaternary environments using palynolgy. In The reconstruction of past environments, edited by J. J. Hester and J. Schoenwetter, Proceedings of the Fort Burgwin Conference on Paleoecology 3. Fort Burgwin Research Center, New Mexico.

Liljeblad, S.

1957 Indian peoples in Idaho. Ms. Idaho State College Museum, Pocatello.

1972 The Idaho Indians in transition, 1805-1960. Special Publication of the Idaho State University Museum.

Love, C. M.

1971 Geology and man in the Teton region. Naturalist 22:4-17.

1972 An archaeological survey of the Jackson Hole region, Wyoming. Unpublished M.A. thesis. Department of Anthropology, University of Wyoming, Laramie.

MacNeish, R. S.

1973 The Ayacucho archaeological sequence. Paper presented at the 38th Annual Meeting, Society for American Archaeology. San Francisco.

Makreel, R. A.

1968 Toward a concept of style. An interpretation of Wilhelm Dilthey's psycho-historical account of the imagination. The Journal of Aesthetics and Art Criticism 27:2:171-182.

Malde, H. E.

1964 Environment and man in arid America. Science 14:123-129.

Martin, P. S.

1963 Early man in Arizona. The pollen evidence. American Antiquity 29:67-73.

Mehringer, P. J.

1967 Pollen analysis of the Tule Springs site, Nevada. In Pleistocene studies in southern Nevada. Nevada State Museum Anthropological Papers 13. 130-200.

Merriam, C. H.

1894 Laws of temperature control of the geographic distribution of terrestrial animals and plants. National Geographic Magazine 6:229-238.

Miller, R. B.

1965 Quaternary freshwater fishes of North America. In The Quaternary of the United States, edited by H. E. Wright and D. G. Frey, pp. 569-581. Princeton University Press, Princeton.

Morrison, R. B.

1966 Predecessors of Great Salt Lake. In The Great Salt Lake. Guidebook to the geology of Utah 20, edited by W. L. Stokes, pp. 77-104. Utah Geological Survey, Salt Lake.

Morrison, R. B., and H. E. Wright, (Editors)

1968 Means of Correlation of Quaternary successions. Volume 8. _Proceedings VII Congress International Association for Quaternary Research_. University of Utah Press, Salt Lake.

Morrison, R. B.

1965 Quaternary geology of the Great Basin. In _Quaternary of the United States_, edited by H. E. Wright and D. G. Frey, pp. 265-285. Princeton University Press, Princeton.

1968 Means of time-stratigraphic division and long-distance correlation of Quaternary successions. In Means of correlation of Quaternary successions, edited by R. B. Morrison and H. E. Wright. _Proceedings VII Congress International Association for Quaternary Research_. University of Utah Press, Salt Lake.

Murphy, R. F. and Y. Murphy

1960 Shoshone-Bannock subsistence and society. _University of California Anthropological Records_ 16:7.

Napton, L. K.

1969 Archaeological and paleological investigations in Lovelock Cave, Nevada. _Kroeber Anthropological Society Publication_ 2.

Odum, E. P.

1963 _Ecology_. Holt, Rinehart and Winston, New York.

Orr, P. C.

1952 Preliminary excavations of Pershing County caves. _Nevada State Museum, Department of Anthropology, Bulletin_ 2.

Patterson, T. C.

1973 _America's past. A new world archaeology_. Scott, Foresman, Glenview.

Pavesic, M. G.

1966 A projectile point "blank" cache from southeastern Idaho. _Tebiwa_ 9:1:52-57.

Pfeiffer, J. E.

1969 The emergence of man. Harper and Row, New York.

Phillips, T.

1972 Plants of the Redfish Overhang area. Unpublished survey report on file with the Idaho State University Museum.

Powers, H. A., and R. E. Wilcox

1964 Volcanic ash from Mount Mazama (Crater Lake) and from Glacier Peak. Science 144:1334-1336.

Ranere, A. J.

1968 Stratigraphy and stone tools from Meadow Canyon, eastern Idaho. Unpublished M.A. thesis, Department of Anthropology, Idaho State University.

Rasmussen, D. J.

1941 Biotic communities of Kaibab Plateau, Arizona. Ecology Monograph 11:229-275.

Richmond, G. M.

1965 Glaciation of the Rocky Mountains. In The Quaternary of the United States, edited by H. E. Wright and D. G. Frey, pp. 217-230. Princeton University Press, Princeton.

Richmond, G. M., R. Fryxell, G. F. Neff and P. L. Weis

1965 The Cordilleran ice sheet of the northern Rocky Mountains and related Quaternary history of the Columbia Plateau. In The Quaternary of the United States, pp. 231-242, edited by H. E. Wright and D. G. Frey. Princeton University Press, Princeton.

Roosma, A.

1958 A climatic record from Searles Lake, California. Science 128:716.

Rorabacher, J. A.

1970 The American buffalo in transition. A historical and economic survey of the bison in America. North Star Press, St. Cloud, Minn.

Rosaire, C. E.

1963 Lake-side cultural specialization in the Great Basin. Nevada State Museum Archaeological Papers 9:72-77.

Ross, A.

1956 The fur traders of the far West, edited by K. A. Spaulding. University of Oklahoma Press, Norman.

Ross, C. P.

1937 Geology and ore deposits of the Bayhorse region, Custer County, Idaho. United States Geologic Survey Bulletin 877:161.

Rouse, I.

1970 Classification for what? Comments on Analytical archaeology by D. L. Clarke. Norweigan Archaeological Review 3:4-9.

Sandkuhle, R. J.

1968 Bird list of Sawtooth Valley and environs. Unpublished survey. United States Department of Agriculture, Forest Service, Ogden, Utah.

Sharrock, F. W.

1966 Prehistoric occupation patterns in southwest Wyoming and cultural relationships with the Great Basin and Plains culture areas. Anthropological Papers 77, University of Utah Press, Salt Lake.

Singer, M., and F. C. Ugolini

1973 Mineralogical properties of two well drained subalpine soils. Paper presented at the 46th Annual Meeting, Northwest Scientific Association, Walla Walla, Washington.

Steen, V. C., and R. Fryxell

1965 Mazama and Glacier Peak pumice glass. Uniformity of refractive index after weathering. Science 150:3698:878-880.

Steward, J. H.

1970 Basin-plateau aboriginal socio-political groups. University of Utah Press, Salt Lake.

Statham, W. P., and M. D. Wilson

1972 Description of some Quaternary volcanic ash beds of the western Snake River Plain. Paper presented at the Annual Meeting, Idaho Academy of Science, Boise.

Struever, S.

1971 Comments on archaeological data requirements and research strategy. American Antiquity 36:1:10:9-19.

Swanson, E. H.

1962 Early cultures in Northwestern America. American Antiquity 28:2:151-158.

1969 Cultural relations between Plateau and Great Basin. Paper presented at 22nd Annual Northwest Anthropological Conference. Northwest Anthropological Research Notes 4:1.

Swanson, E. H., and A. L. Bryan

1964 Birch Creek Papers No. 1. An Archaeological reconnaissance in the Birch Creek Valley of eastern Idaho. Occasional Papers of the Idaho State University Museum 13.

Swanson, E. H., B. R. Butler and R. Bonnichsen

1964 Birch Creek Papers No. 2. Natural and cultural stratigraphy in the Birch Creek Valley of eastern Idaho. Occasional Papers of the Idaho State University Museum 14.

Tadlock, W. L.

1966 Certain crescentic stone objects as a time marker in the western United States. American Antiquity 31:5:662-675.

Tuohy, D. R.

1968 Some early lithic sites in western Nevada. In Early man in western North America, edited by C. Irwin-Williams. Eastern New Mexico University Contributions in Anthropology 1:4:27-37.

1970 The Coleman locality. A basalt quarry and workshop near Falcon Hill, Nevada. Nevada State Museum Anthropological Papers 15.

1969 Breakage, burin facets, and the probable technological linkage among Lake Mohave, Silver Lake, and other varieties of projectile points in the Desert West. Nevada State Museum Anthropological Papers 14.

United States Forest Service and National Park Service

1965 Sawtooth Mountain Area Study. Summary. Headquarters, Sawtooth National Forest, Twin Falls, Idaho.

Wallace, W. J.

1962 Prehistoric cultural development in the southern California deserts. American Antiquity 28:2:172-180.

Warren, C. N.

1967 The San Dieguito complex. A review and hypothesis. American Antiquity 32:-:168-185.

Warren, C. N., and J. DeCosta

1964 Dating Lake Mohave artifacts and beaches. American Antiquity 30:2:206-208.

Warren, C. N., and H. T. Ore

1971 Late Pleistocene - early Holocene geomorphic history of Lake Mojave, California. Geological Society of America Bulletin 82:255302562.

Warren, C. N., and A. J. Ranere

1968 Outside Danger Cave. A view of early man in the Great Basin. In Early man in western North America, edited by C. Irwin-Williams. Eastern New Mexico University Contributions in Anthropology 1:4:6-18.

Weide, M. L., and D. L. Weide

1969 A cache from Warner Valley, Oregon. Tebiwa 12:2:28-34.

Wendorf, F., and J. J. Hester

1962 Early man's utilization of the Great Plains environment. American Antiquity 28:159-171.

Wilcox, R. E.

1965 Volcanic ash chronology. In *The Quaternary of the United States*, edited by H. E. Wright and D. G. Frey, pp. 807-816. Princeton University Press, Princeton.

Willey, G. R.

1966 *An introduction to American archaeology. Vol. I. North and Middle America*. Prentice-Hall, Inc. Englewood Cliffs, N. J.

Willey, G. R., and P. Phillips

1958 *Method and theory in American archaeology*. University of Chicago Press, Chicago.

Williams, P. L.

1961 Glacial geology of Stanley Basin. *Idaho Bureau of Mines and Geology Pamphlet* 123, Moscow.

Williams, L., D. H. Thomas, and R. Bettinger

1972 Notions to numbers. Great Basin settlement patterns as polythetic sets. Paper presented to the Great Basin Anthropological Conference. Salt Lake.

Wormington, H. M.

1957 *Ancient man in North America*, 4th edition. Denver Museum of Natural History Popular Series 4.

Wormington, H. M., and R. G. Forbis

1965 An introduction to the archaeology of Alberta, Canada. Denver Museum of Natural History, Popular Series No. 47, Denver.

Wright, G. A.

1972 Preliminary report on an archaeological survey of Grand Teton National Park, Wyoming. Department of Anthropology, State University of New York, Albany.

Yankee Fork *Herald*

1879 Yankee Fork *Herald*. Bonanza City, Idaho.

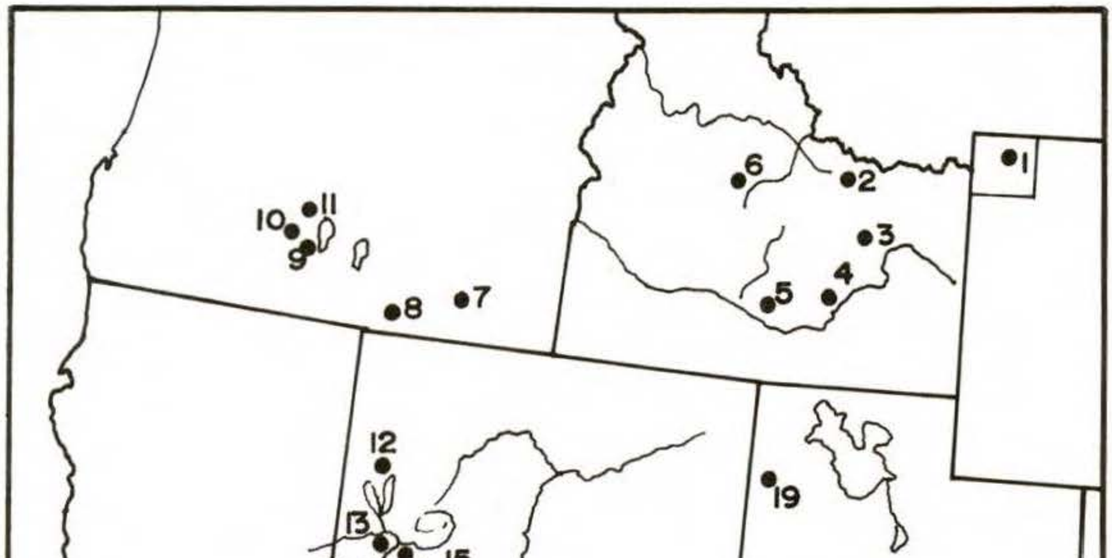
FIGURES

Fig. 1

Location of sites and areas cited in text.

Map Area -- Wyoming, Idaho, Oregon, Nevada, Utah and California

1. Yellowstone Park
2. Birch Creek
3. Wasden Site
4. Lake Channel
5. Wilson Butte Cave
6. Redfish Overhang
7. Coyote Flat
8. Guano Valley
9. Connely Caves
10. Fort Rock Cave
11. Cougar Mountain Cave
12. Coleman
13. Brady's Hot Spring
14. Sadmat Site
15. Hathaway Beach
16. Lake Tonopah
17. Mud Lake
18. Smith Creek Cave Site, White Pine Co.
19. Danger Cave
20. Lund Site, Escalante Valley
21. Lake Mohave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21
0 50 100
MILES

Fig. 2a View of the Sawtooth Mountains from the top of the moraine above the Redfish Overhang.

Fig. 2b Redfish Overhang after excavation.

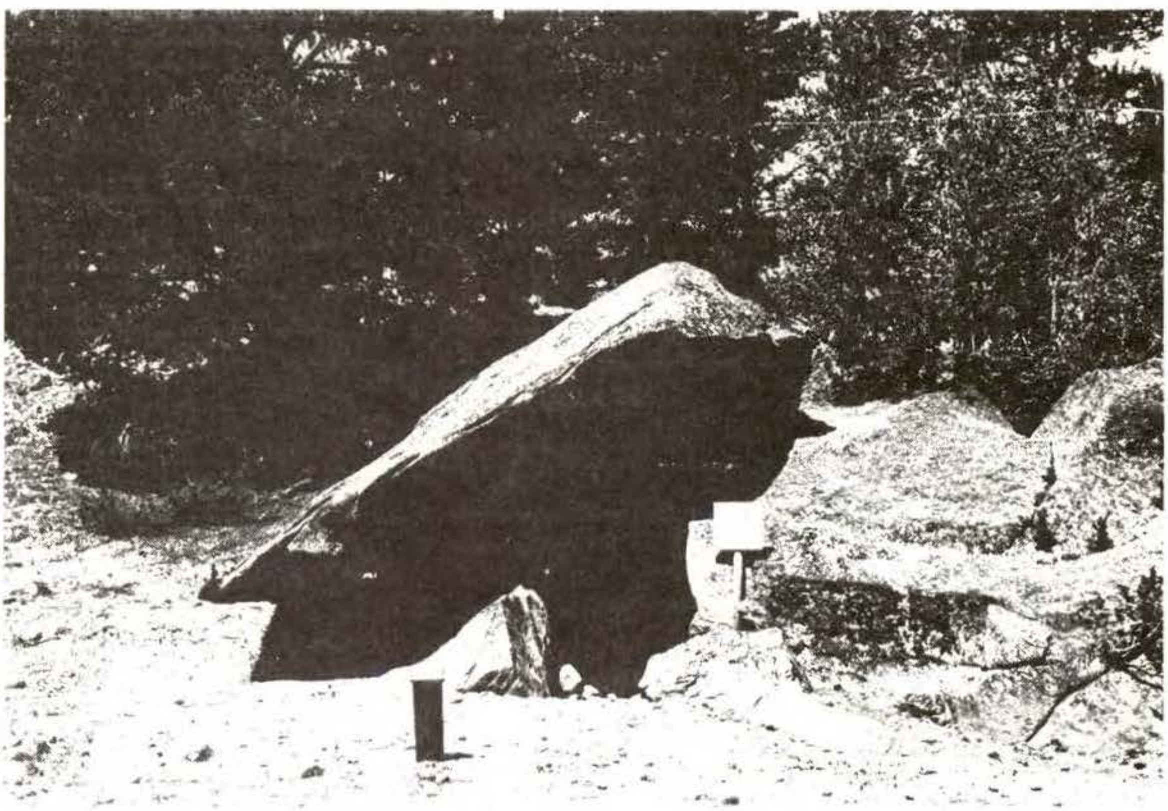
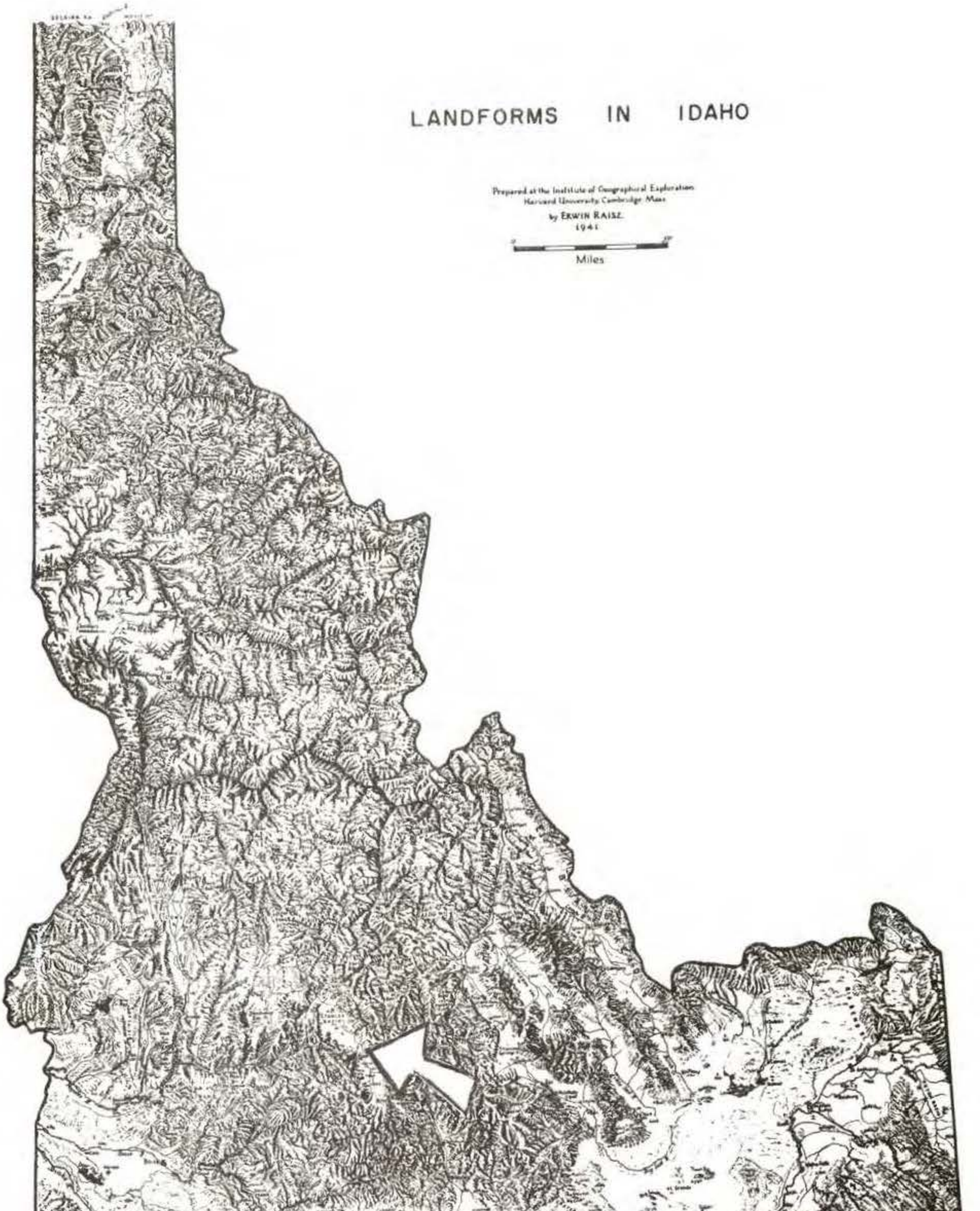


Fig. 3 Landforms in Idaho (taken from Butler 1968).
Arrow indicates Redfish Overhang site (10CR201)



LANDFORMS IN IDAHO

Prepared at the Institute of Geographical Exploration
Harvard University Cambridge Mass
by ERWIN RAISZ
1941

Miles

Fig. 4 Sketch map of Stanley Basin.

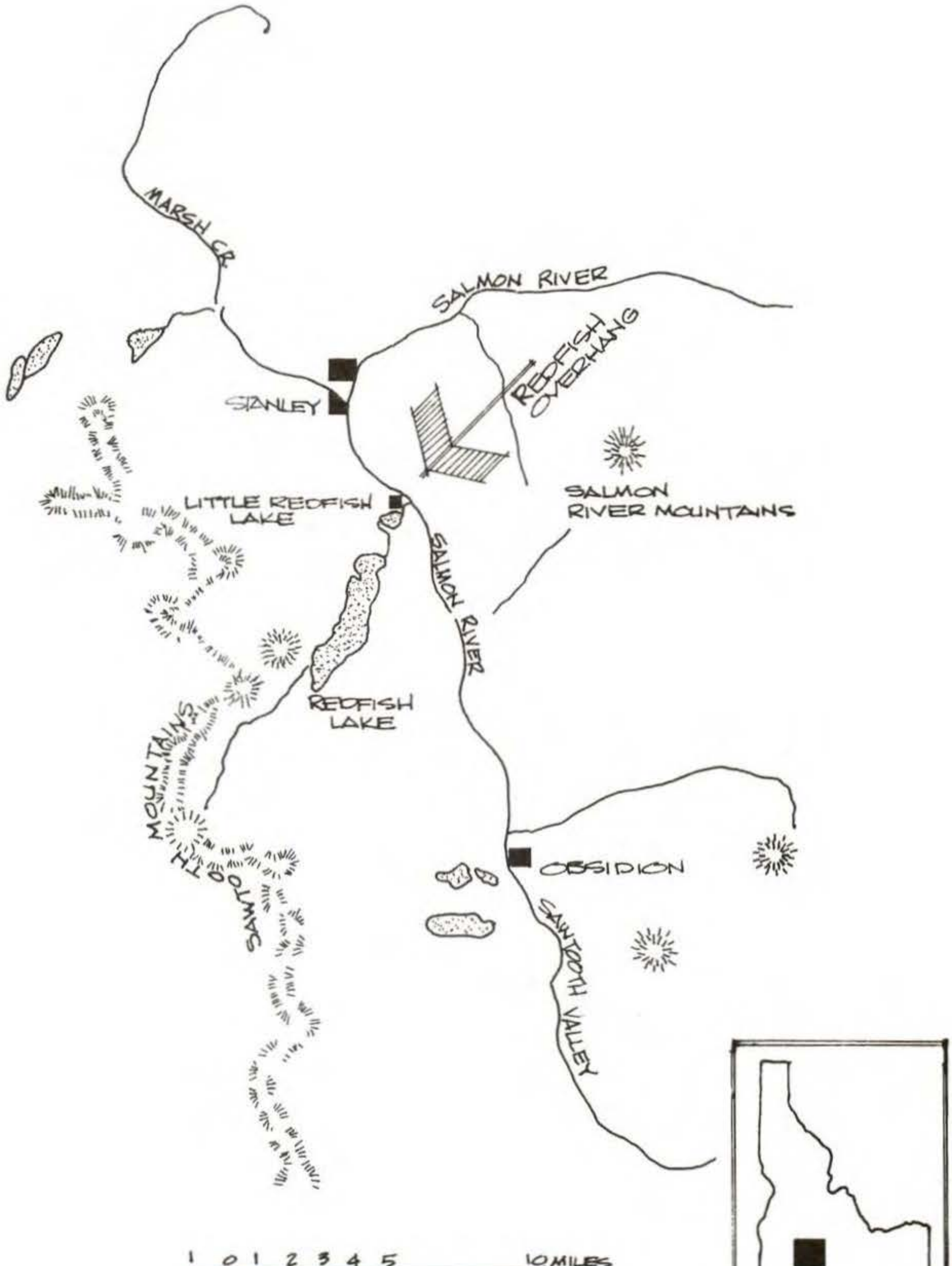

MARSH CR.
SALMON RIVER
REDFISH OVERHANG
STANLEY
LITTLE REDFISH LAKE
SALMON RIVER MOUNTAINS
SALMON RIVER
REDFISH LAKE
SAWTOOTH MOUNTAINS
OBSIDION
SAWTOOTH VALLEY
1 0 1 2 3 4 5 10 MILES
IDAHO

Fig. 5 Contour map of Redfish Overhang Site.
(10CR201)

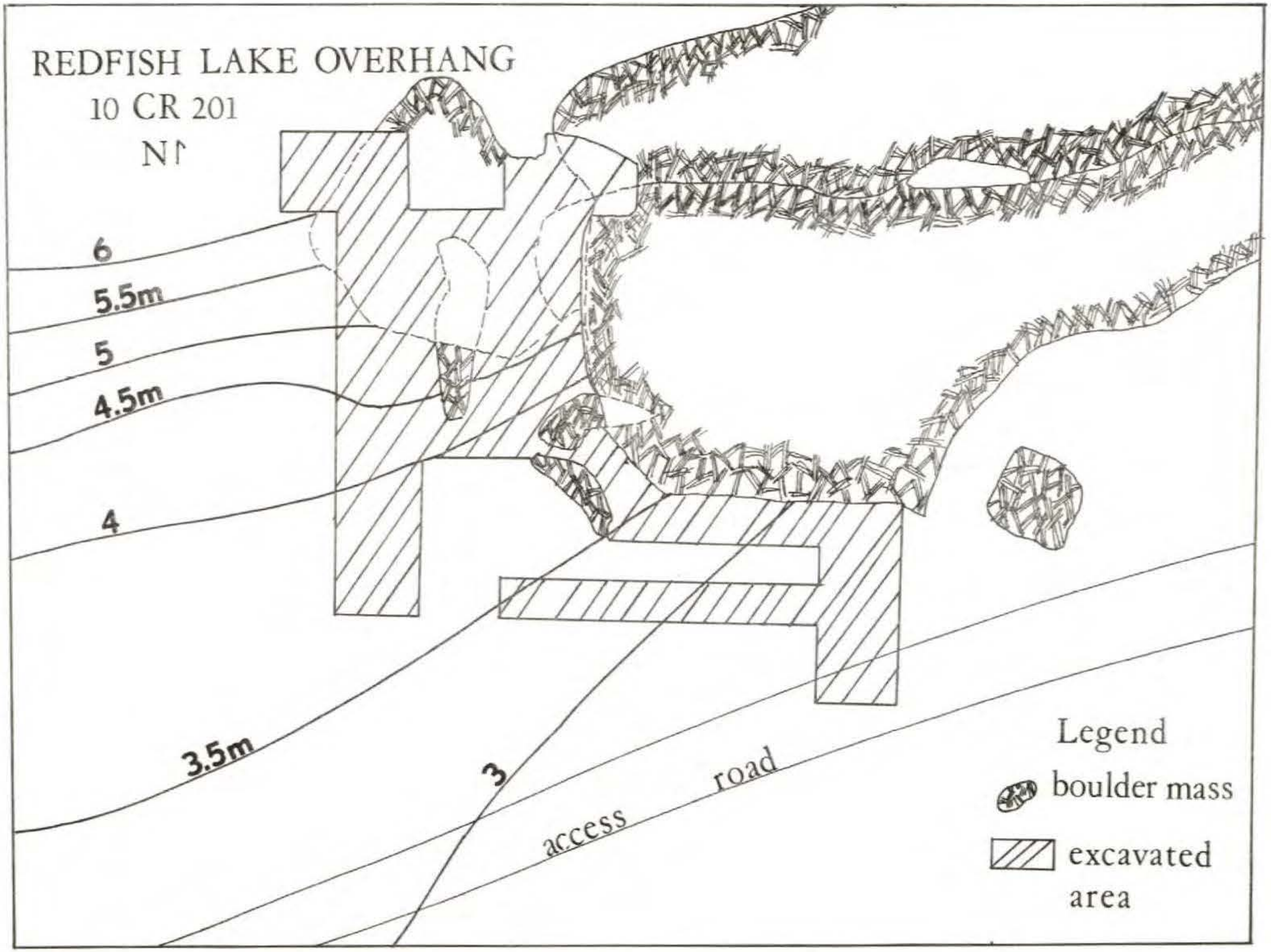
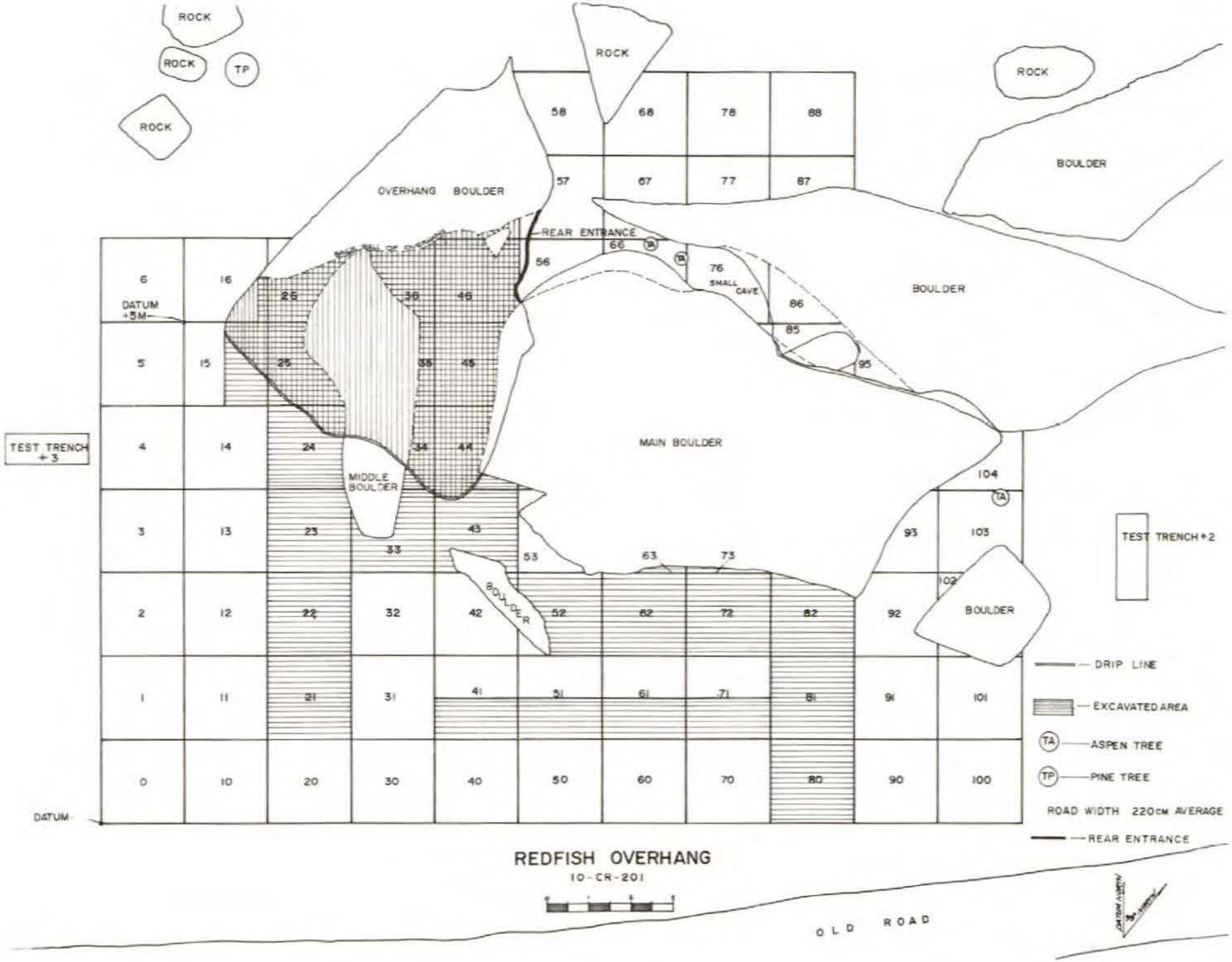

REDFISH LAKE OVERHANG
10 CR 201
N↑
6
5.5m
5
4.5m
4
3.5m
3
access road
Legend
boulder mass
excavated area

Fig. 6 Map of Redfish Overhang Site showing excavated areas.



REDFISH OVERHANG
10-CR-201

Fig. 7a Little Redfish Lake from the moraine behind Redfish Overhang. Sawtooth Mountains in the background.

Fig. 7b Glacially rafted boulders encountered in excavation in foreground. Middle boulder of the Redfish Overhang on the right. An earth oven was found in area where crew member is standing.

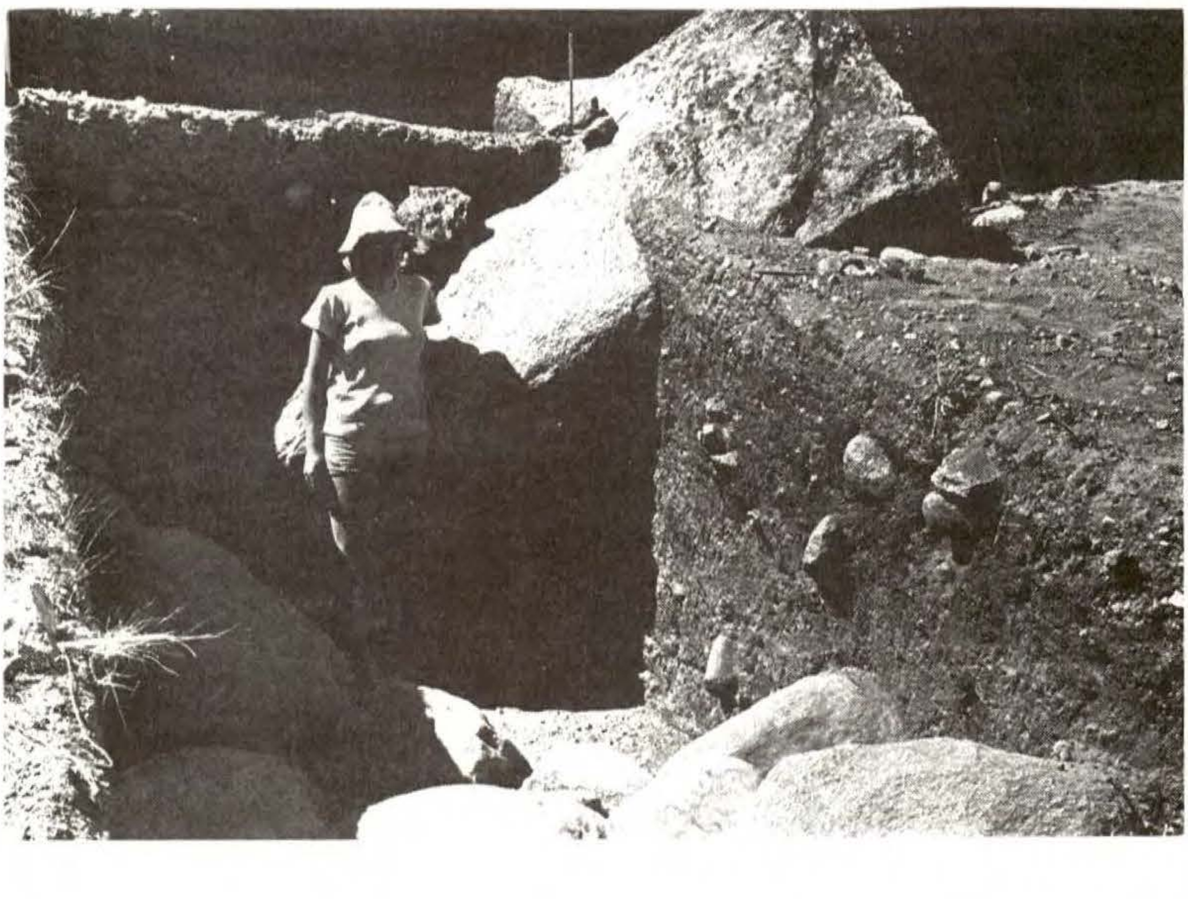
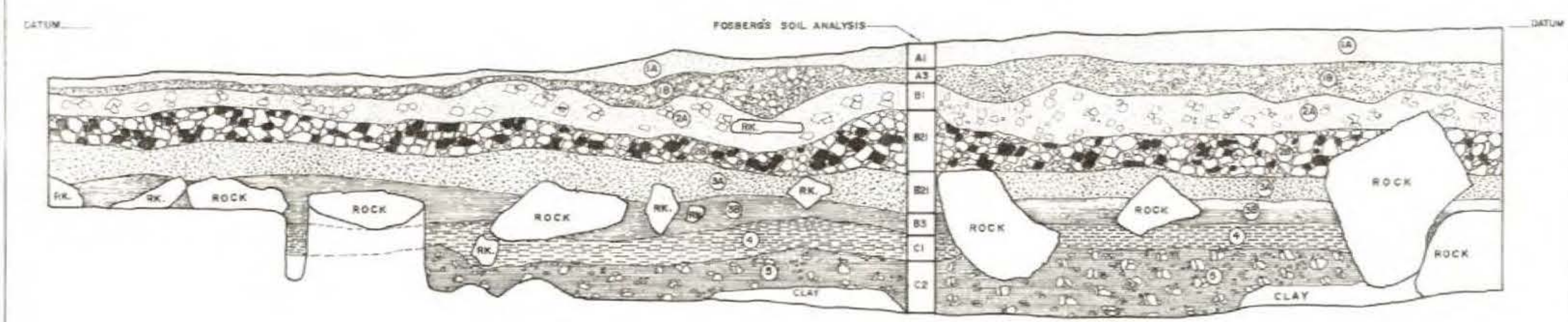
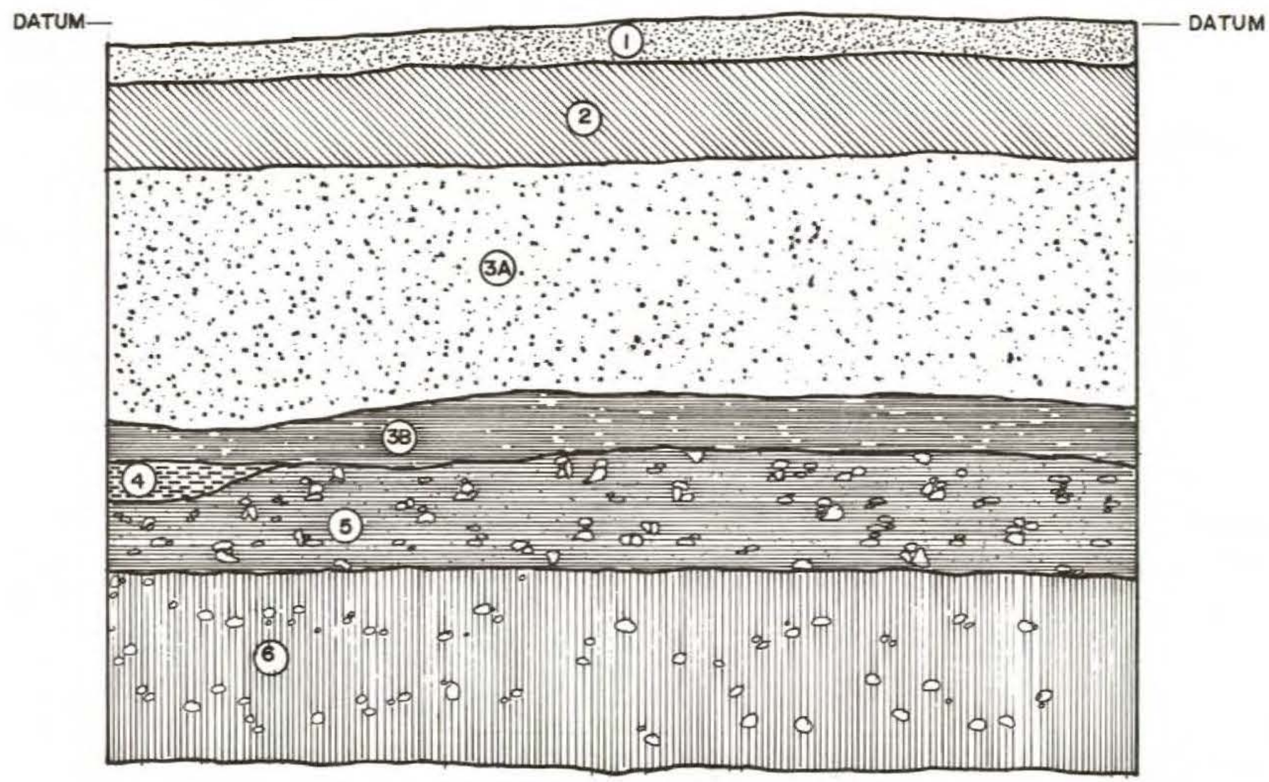


Fig. 8 Profile of west wall, Blks. 80-81-82
(10CR201)



REDFISH OVERHANG
10CR201
NORTH-SOUTH PROFILE
BLKS 80-81-82 NE
SCALE

Fig. 9 Profile of east wall, Blk. 36
(10CR201)



REDFISH OVERHANG
10 CR 201
EAST WALL
BLK. 36

SCALE 10 CM.

Fig. 10 Haskett artifacts found in the Redfish Overhang.

	Fig. Letter	Spec. No.
Fragments	a	94
	b	261
Blanks	c	182
	d	215
	e	213
	g	212
	h	214
	i	216
Preforms	f	181
	j	221
	k	142
Point	l	220
Composite tool	m	217
Scrapers	n	218
	o	219

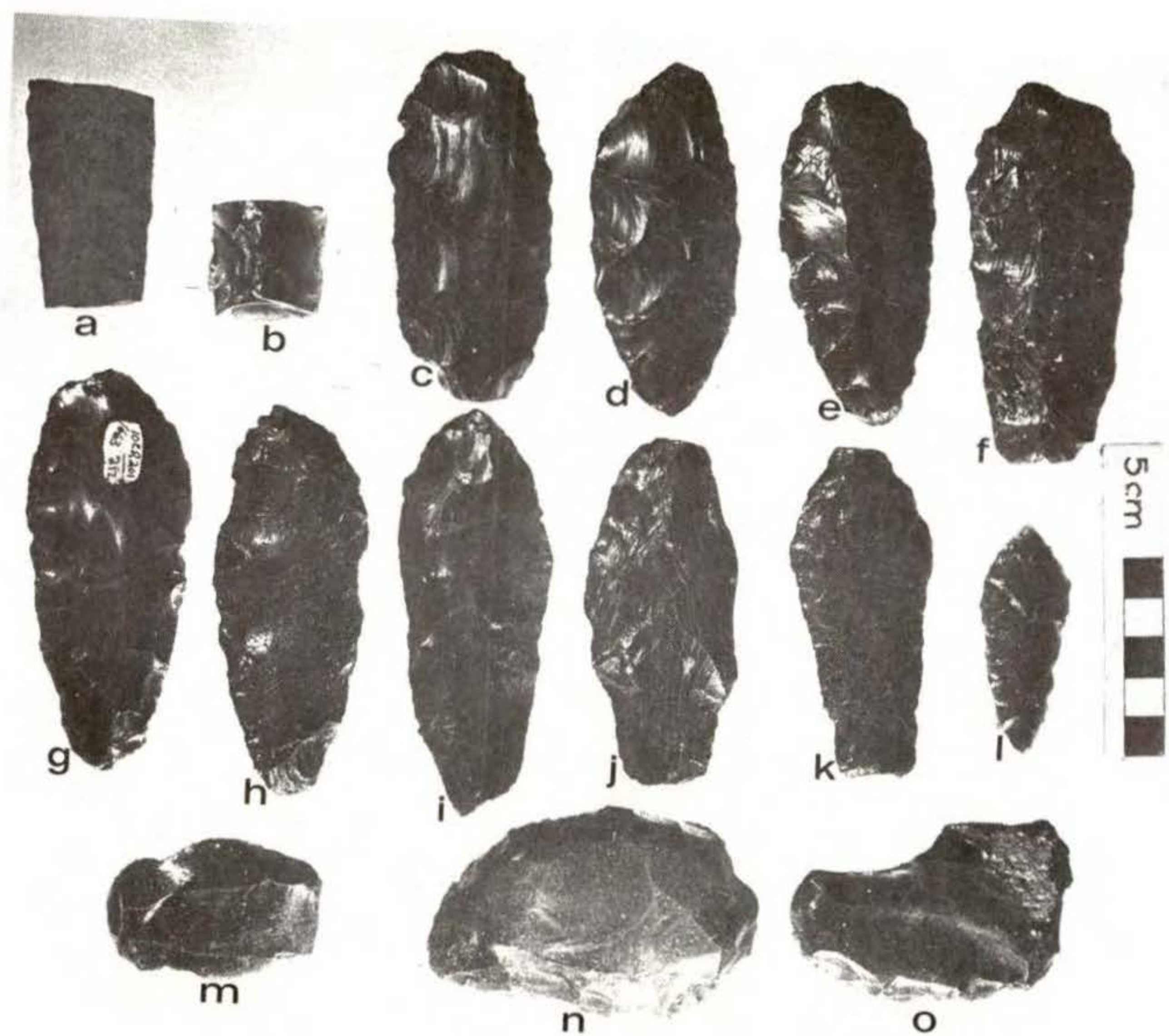

a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
5 cm

Fig. 11a Cache with Haskett artifacts _in situ_.

Fig. 11b Microtools with burin facets. Specimens "a" and "b" are from Lake Channel, Idaho. The remainder are from Smith Creek Cave Site, White Pine Co., Nevada.

Fig. 12

USE OF LITHIC MATERIAL BY PERCENTAGE, REDFISH OVERHANG		
	10,600 - 7,000 BP	1,000 BP - 1,900 AD
Chalcedony	61	60
Obsidian	21	20
Ignimbrite	8	11
Rhyolite	3	unknown
Basalt	3	1
Quartzite	3	6
Miscellaneous	1	1

Fig. 13 Redfish Overhang Site. (10CR201)

a,b Distribution of chipping waste.

REDFISH OVERHANG
DISTRIBUTION OF CHIPPING WASTE
10,600 — 7000 BP
GRID NORTH
M.N.
INTENSIVE USE
LIMITED USE
BACK WALL OF OVERHANG
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5
6

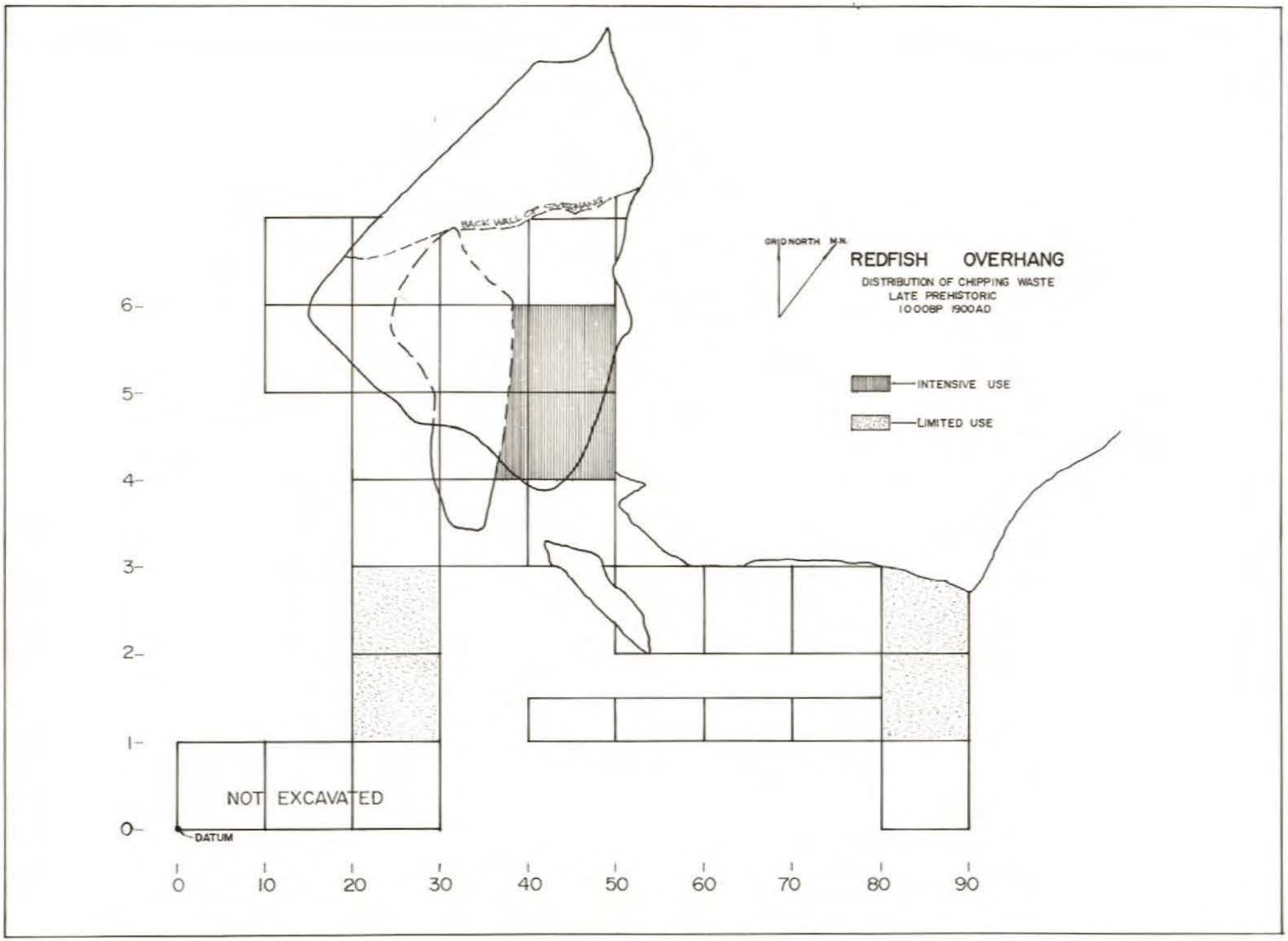

GRID NORTH
M.N.
REDFISH OVERHANG
DISTRIBUTION OF CHIPPING WASTE
LATE PREHISTORIC
1000BP 1900AD
INTENSIVE USE
LIMITED USE
BACK WALL OF OVERHANG
NOT EXCAVATED
DATUM
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90

Fig. 14a,b Redfish Overhang site activity areas. (10CR201)

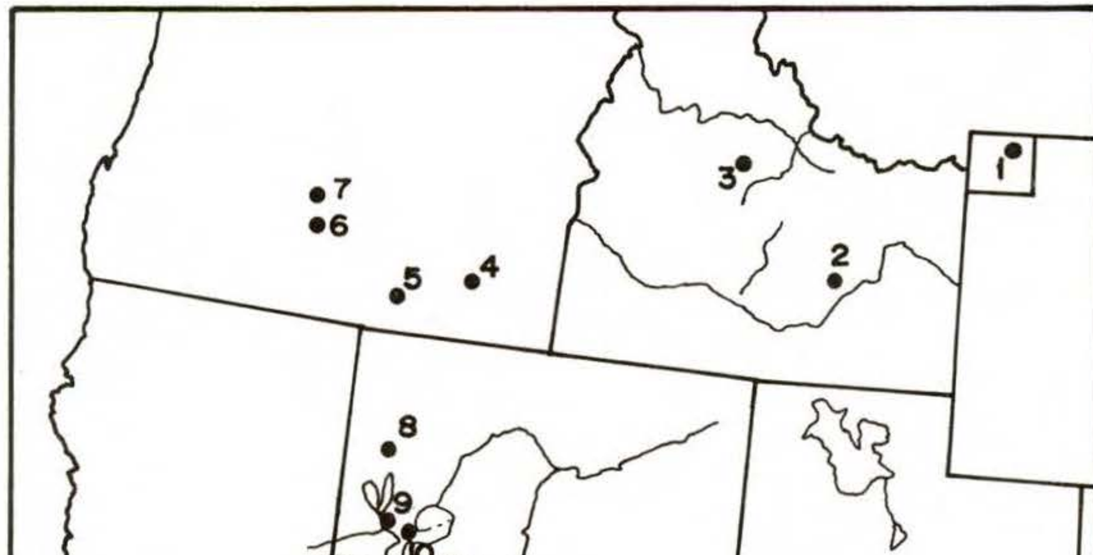
REDFISH OVERHANG
ACTIVITY AREAS
EARLY PERIOD
11, 600–7000BP
INTENSIVE USE
LIMITED USE
GRID NORTH
M.N.
NOT EXCAVATED
DATUM
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90

REDFISH OVERHANG
ACTIVITY AREAS
LATE PREHISTORIC
1000BP-1900AD
INTENSIVE USE
LIMITED USE
GRID NORTH
M.N.
BACK WALL OF OVERHANG
NOT EXCAVATED
DATUM
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90

Fig. 15 Haskett Site distribution.

Map Area -- Wyoming, Idaho, Oregon, Nevada, Utah and California

1. Yellowstone Park
2. Lake Channel
3. Redfish Overhang
4. Coyote Flat
5. Guano Valley
6. Connely Caves
7. Cougar Mountain
8. Coleman
9. Brady's Hot Springs
10. Sadmat
11. Hathaway Beach
12. Lake Tonopah
13. Mud Lake
14. Lund Site, Escalante Valley
15. Lake Mohave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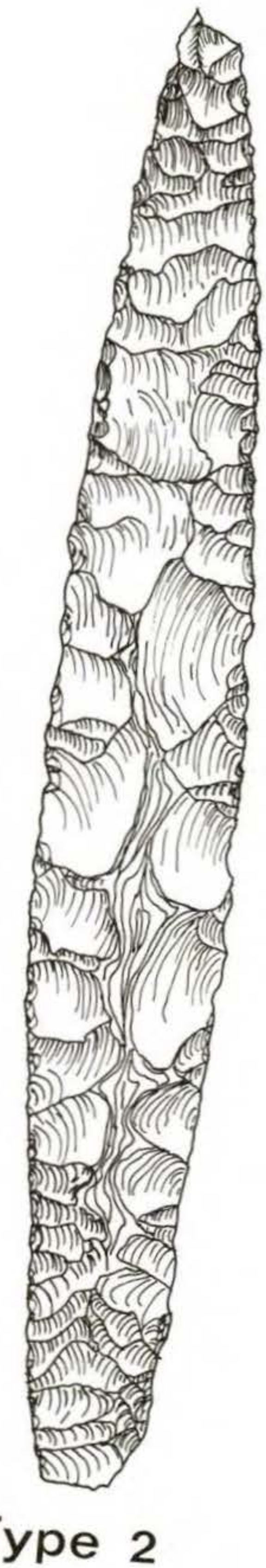
0 50 100
MILES

Fig. 16 a. Hasket point, type 1.

b. Haskett point, type 2.

Type 1



Type 2

Fig. 17a Figure references, dimension and materials for Haskett type points and point bases from Lake Channel, Idaho (Faler in Butler 1965: Table 1).

Fig. 17b Figure references, dimensions and materials for Haskett artifacts from the Redfish Overhang cache.

a. Haskett Artifacts, Lake Channel, Idaho

Spec. No.	Fig. Ref.	Weight	Length	Width	Thick	Material
			Type 1 Points			
H1	e	33.0	12.2	2.7	1.1	black obsidian
H2	d	29.0	8.8	3.0	1.0	olive chalcedony
H6	h	29.9	9.2	3.0	1.0	red rhyolite
5328	g	38.2	12.5	3.4	1.0	white chalcedony
5358	c	23.1	9.5	3.0	1.0	red-brown chalcedony
5363	f	50.1	12.0	3.3	1.0	grey quartzite
			Type 2 Points			
H4	l	69.6	22.0	3.0	1.1	black obsidian
H5	k	51.0	13.2	3.1	1.2	black ignimbrite
			Bases			
5359	a	-	3.0	2.1	1.0	black ignimbrite
5361	b	-	1.5	1.8	0.7	white chalcedony

b. Haskett Artifacts, Redfish Overhang, Idaho

Spec. No.	Fig. Ref.	Weight	Length	Width	Thick	Material
			Fragments			
94	a	32.9	5.5	3.3	1.2	quartzite
261	b	20.9	3.0	2.8	1.2	obsidian
			Blanks			
182	c	57.3	8.9	4.2	1.2	obsidian
215	d	46.7	8.8	3.9	1.0	obsidian
213	e	46.5	10.0	4.2	1.0	ignimbrite
212	g	55.0	8.7	4.0	.8	obsidian
214	h	46.6	9.8	4.0	.8	ignimbrite
216	i	46.7	10.2	3.9	.9	ignimbrite
			Preforms			
181	f	62.1	9.6	4.4	1.2	ignimbrite
221	j	46.7	8.8	4.9	.9	ignimbrite
142	k	47.8	8.3	3.7	.8	ignimbrite
			Point			
220	l	18.6	5.9	2.4	.5	obsidian
			Composite tool			
217	m	23.3	5.5	3.7	.5	obsidian
			Scrapers			
218	n	78.9	8.5	5.5	1.5	ignimbrite
219	o	46.7	7.5	4.7	1.0	ignimbrite

Fig. 18 Haskett points, Lake Channel, Idaho.

a,b. Bases

c-j. Type 1

k,l. Type 2


5cm
a
b
c
d
e
f
g
h
i
j
k
l

Fig. 19 Haskett points from Oregon and Idaho sites.

a,b. Big Springs, Guano Valley, Oregon

c. Lake Channel, Idaho

d. Big Springs, Guano Valley, Oregon

e. Connely Caves, Oregon

f. Lake Channel, Idaho

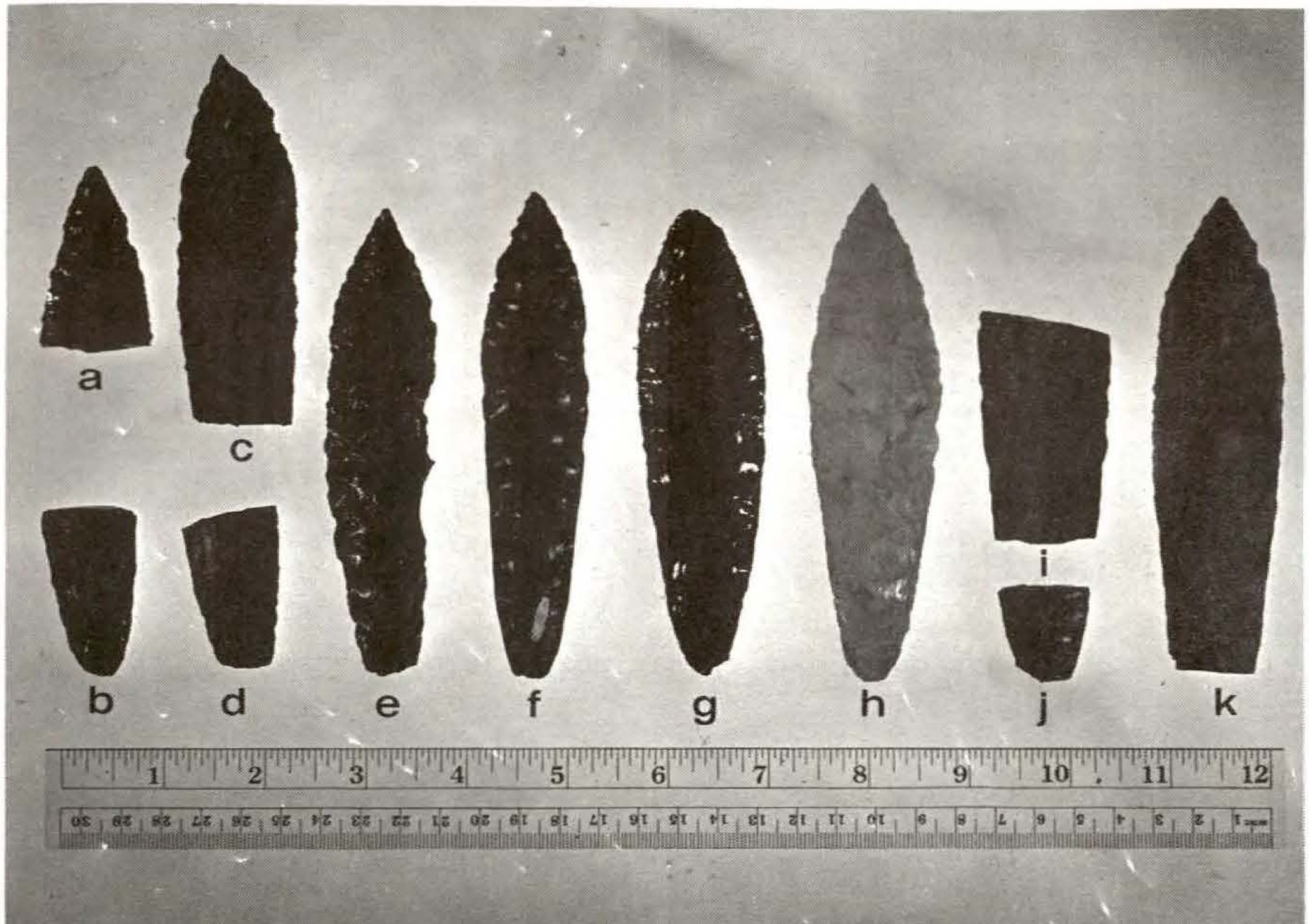
g. Connely Caves, Oregon

h. Lake Channel, Idaho

i. Redfish Overhang, Idaho

j. Big Springs, Guano Valley, Oregon

k. Lake Channel, Idaho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c
d
e
f
g
h
i
j
k

Fig. 20 Haskett points from Nevada and Idaho sites.

a,b. Sadmat Site, Nevada

c. Hathaway Beach Site, Nevada

d. Brady Site, Nevada

e,f. Haskett Site, Lake Channel, Idaho

g. Redfish Site, Idaho

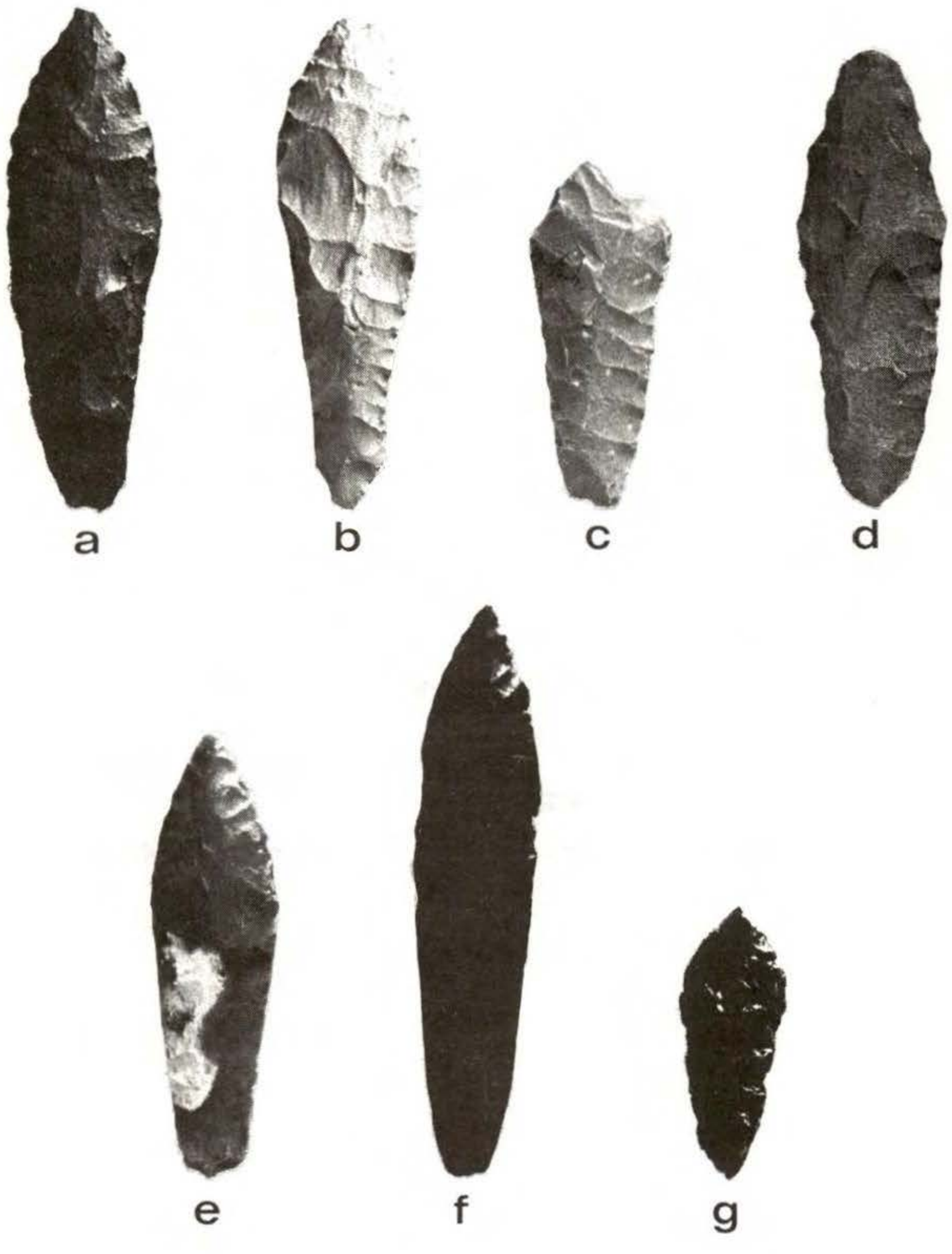

a
b
c
d
e
f
g
0
5
10cm

Fig. 21 Projectile point types.

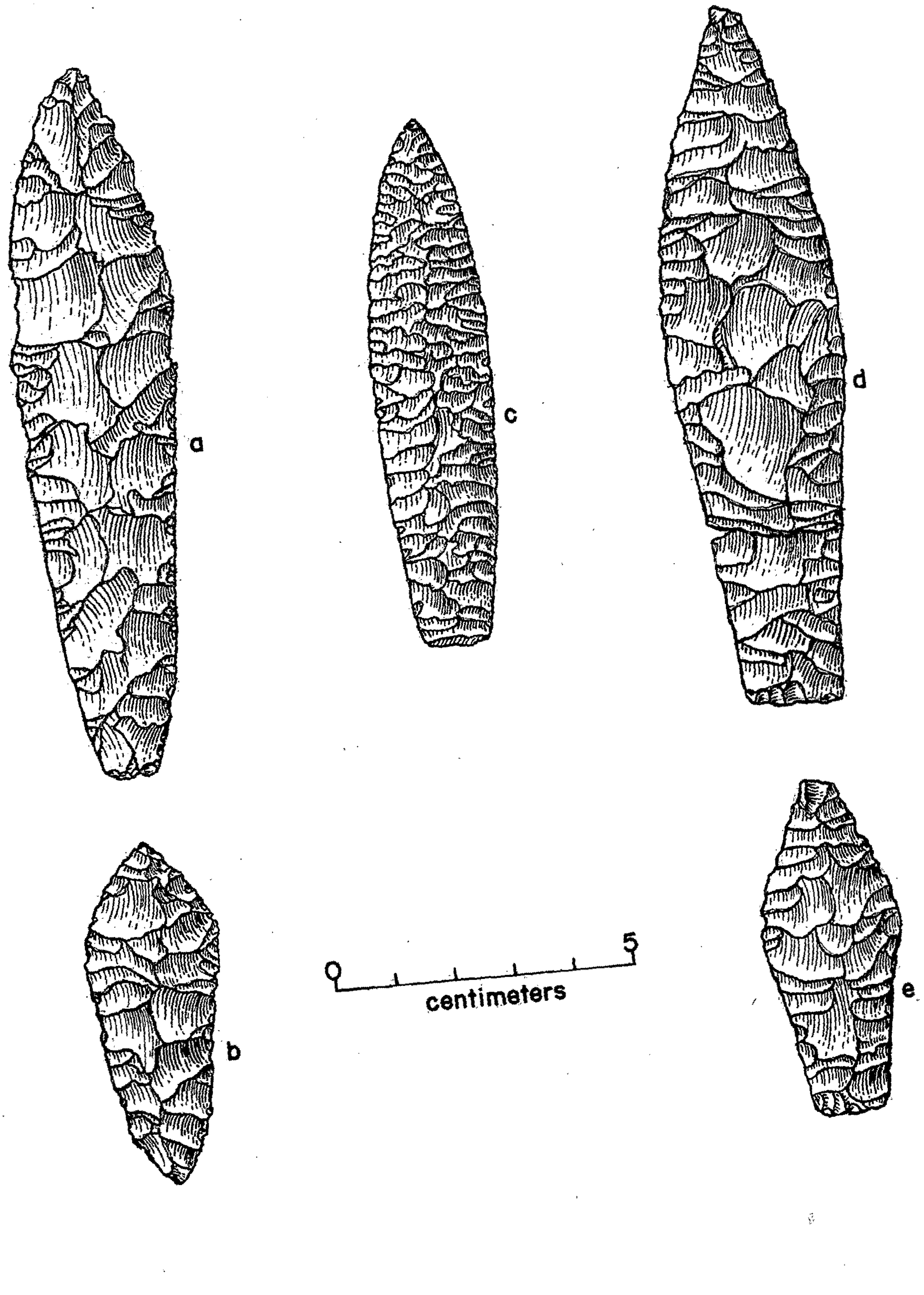
a. Haskett, Lake Channel Site, Idaho

b. Haskett, Redfish Overhang Site, Idaho

c. Agate Basin

d. Hell Gap, Casper Site, Wyoming

e. Hell Gap reworked point, Casper Site, Wyoming.


a
c
d
b
0
5
centimeters
e

ADDENDUM

Based upon the results of the 1972 excavation of the Redfish Overhang, an agreement was concluded between representatives of the U.S. Forest Service and Idaho State University to pursue the excavation of the overhang for a two week period in the summer of 1973.

I returned to Redfish Overhang with a crew of four persons at the end of June. Our immediate goal was to excavate the remaining sections of Blks. 36 and 46 at the back of the chamber on the east side. Blk. 36 is a triangular shaped section fitting into a recessed area between the middle boulder and the back wall of the overhang. A small section of Blk. 46 lay adjacent to it.

The walls were stripped in 10 cm levels as in the rest of the excavation. Removal was by trowel and dustpan and all deposits were then screened. Soil horizons were encountered similar to those already described in the body of this report. Composition of the soil varied from sandy loam to silty loam with considerable gravel and increasing numbers of fist sized and smaller cobbles in the lower levels. Deposition in Layers 1-5 appeared to be mainly by colluvium through the back entrance to the overhang. The lowest level, Layer 6, is composed of culturally sterile sands and cobbles with intermittent streaks of iron-stained sand. Here, deposition seems to be by interaction of alluviation and colluvium (Dort, personal communication, 1973).

At the 10-20 cm level, scattered charcoal began to appear, concentrated along the back wall formed by the overhang roof. Small amounts of charcoal and a few waste flakes were found in each level thereafter.

At the 60-70 cm level (151 cm below datum site) a hearth feature was found with a black obsidian scraper-knife (4.5 x 2.5 cm) as well as several waste flakes.

Another hearth appeared at the intersection of Blks. 36 and 46 in a recessed corner of the back wall at the 80-90 cm level. This level correlates with the provenience of the cache of Haskett material found on the west side of the overhang in 1972, that is, at the surface of the paleosol, Layer 4. Just below this level (90-100 cm) more charcoal was found in darkly stained sand with several waste flakes of obsidian, ignimbrite and chert. A jasper flake tool (6 x 3.5 cm) found at this level appears to be a composite tool used as a scraper, graver and spokeshave. No further evidence of cultural deposits was encountered in this section.

Dr. Dort, who had examined the site in 1972, suggested that several test pits should be dug near the site to determine the stratigraphy of the surrounding area. During the 1973 excavation, three test pits were dug: No. 1 on the floodplain in front of the site, No. 2 east of the formerly excavated area on the terrace, and No. 3 on the moraine west of the overhang. All three revealed soil formation similar to that of the overhang and terrace except for the absence of Layer

4, a paleosol.

One other area of the overhang was excavated. This was a triangular section removed from Blks. 13 and 14 to widen the area on the west side of the overhang so that the interior is more accessible and to allow for preservation of the west walls. This section of the site slopes very steeply from the lip of the overhang. A small hearth was encountered and several artifacts of late prehistoric manufacture.

Conclusions. While little of diagnostic value was found in the 1973 excavation of Redfish Overhang, it is felt that the project was very much worthwhile. Charcoal taken from various layers of Blks. 36 and 46 should allow corroboration of correlated layers and cultural material elsewhere in the overhang. This should be especially valuable in determining the age of the earliest Haskett material. The cache has already been dated at 9,860 BP, but the Haskett point fragment found at a lower level has not, so far, been dated.