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SCRATCHING DEER: A LATE PREHISTORIC CAMPSITE IN THE GREEN LAKES VALLEY, COLORADO

by

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ABSTRACT

The Scratching Deer site (5 BL 69) is a small, single-component Hog Back Phase campsite in the upper subalpine forest, western Boulder County, Colorado. The site was occupied 1260 + 95 radiocarbon years ago, probably by hunters attracted to the region by stone game-drive systems on a nearby tundra ridgecrest. Although few tools were discarded at the site, analysis of waste flakes suggests that large numbers of cutting and scraping tools were resharpened in the occupation area, and that new tools were manufactured, possibly from imported stone that was heat-treated in especially-prepared hearths. Occupation was preceded by an interval of expanded snow cover and accelerated erosion, and was followed by an interval of loess accumulation and redeposition; snowbanks have never again been as persistent on the floor of the Green Lakes valley as they were a few centuries prior to occupation.

INTRODUCTION

Although many prehistoric cultures have hunted with stone game-drive systems along the tundra crest of the Colorado Front Range, few have pursued the technique so assiduously, or used the high-mountain environment so intensively, as the Plains Woodland or Shoshonean complex that Nelson (1971) has designated the "Hog Back Phase". The complex is known primarily from excavated rockshelters and open campsites in the Front Range foothills, a mild and resource-rich environment suitable for year-round occupation (Benedict 1975a). Much less is known about Hog Back Phase activities in the timberline and tundra environments, which were used only seasonally, during the summer and early fall. Excavations at the Murray site, near the summit of Mount Albion, have provided information on Hog Back Phase game-drive hunting techniques (Benedict 1975b). The present paper provides complementary information on the domestic activities of a Hog Back Phase hunting party camped at the Scratching Deer site, on the floor of the Green Lakes valley, in the afternoon shadow of Mount Albion.

SETTING

The site is located on the tread of a small terrace in the upper fringes of the subalpine forest, near the outskirts of the abandoned mining camp of Albion. Its elevation is 3305 m. (10,840 ft.), and its coordinates are 40°02'28" N. Lat., 105°35'48" W. Long. The terrace overlooks one of several linear meadows that lead from the valley floor to the eastern end of Albion Ridge (Fig. 1). Because of its location, the site would have been a convenient living area for people visiting the region to make use of game-drive systems above timberline.

The terrace is a product of periglacial mass-wasting processes, operating on glacial till intermittently saturated with meltwater from a late-lying snowbank. The terrace surface is sparsely vegetated with *Sibbaldia procumbens,* mosses, grasses, and liverworts, reflecting the persistence of snow and the abundance of moisture. The front of the terrace is relatively dry, and bears a mature stand of Engelmann spruce (*Picea engelmanii*) and subalpine fir (*Abies lasiocarpa*), which shades the site until mid-morning, and screens it from the small valley to the east. Because of the protection offered by the fringe of timber, the site is comfortable even on windy autumn days when snow is blowing on the tundra ridgecrest to the south.

The steep slope at the rear of the terrace is cut in bedrock and mantled with a thin and discontinuous cover of Late Pinedale ground moraine. Several large erratic boulders are embedded in the slope (Fig. 1), which is open and grassy except for stunted spruce and fir seedlings. The growth forms of the seedlings reflect mechanical damage caused by creep within the basal layers of the thick winter snowpack; their unhealthy appearance is a result of the short snow-free growing season,

Figure 1: View of the lower Green Lakes valley, looking northward from the slopes of Albion Ridge. The lake and road in the background are part of the abandoned townsite of Albion. An arrow points to the Scratching Deer site. July 13, 1967.

which encourages fungal diseases and prevents the young trees from synthesizing sufficient food for vigorous growth.

Under present non-glacial conditions the terrace does not become free of snow until mid-July, and is saturated with meltwater for at least one additional month. During climatic episodes that were significantly colder and/or snowier than the present, occupation of the terrace surface would have been impracticable.

The valley south and east of the site contains a small spring and stream (Fig. 2), supplied with water by melting snowbanks and ground ice on the north flank of Albion Ridge. Water is available from the stream during the summer months and in all but the driest autumns. Sedges, rushes, low willows, and a profusion of subalpine wildflowers carpet the valley floor.

EXCAVATION PROCEDURE

The site was excavated within the framework of a ½ X ½ m. grid system. Excavation was by natural stratigraphic units, and by 2.5-cm. depth increments within each natural horizon. The entire site was troweled, and the soil was wet-seived through ¼-inch (0.6 cm.) hardware cloth. Eighty-six percent of the artifacts recovered from the site were found *in situ*. A total area of 15 m2 was excavated on the terrace surface (Fig. 3); a test pit in dense timber at the terrace front (Fig. 2) produced small charcoal fragments, but no bone scraps or chipping debris.

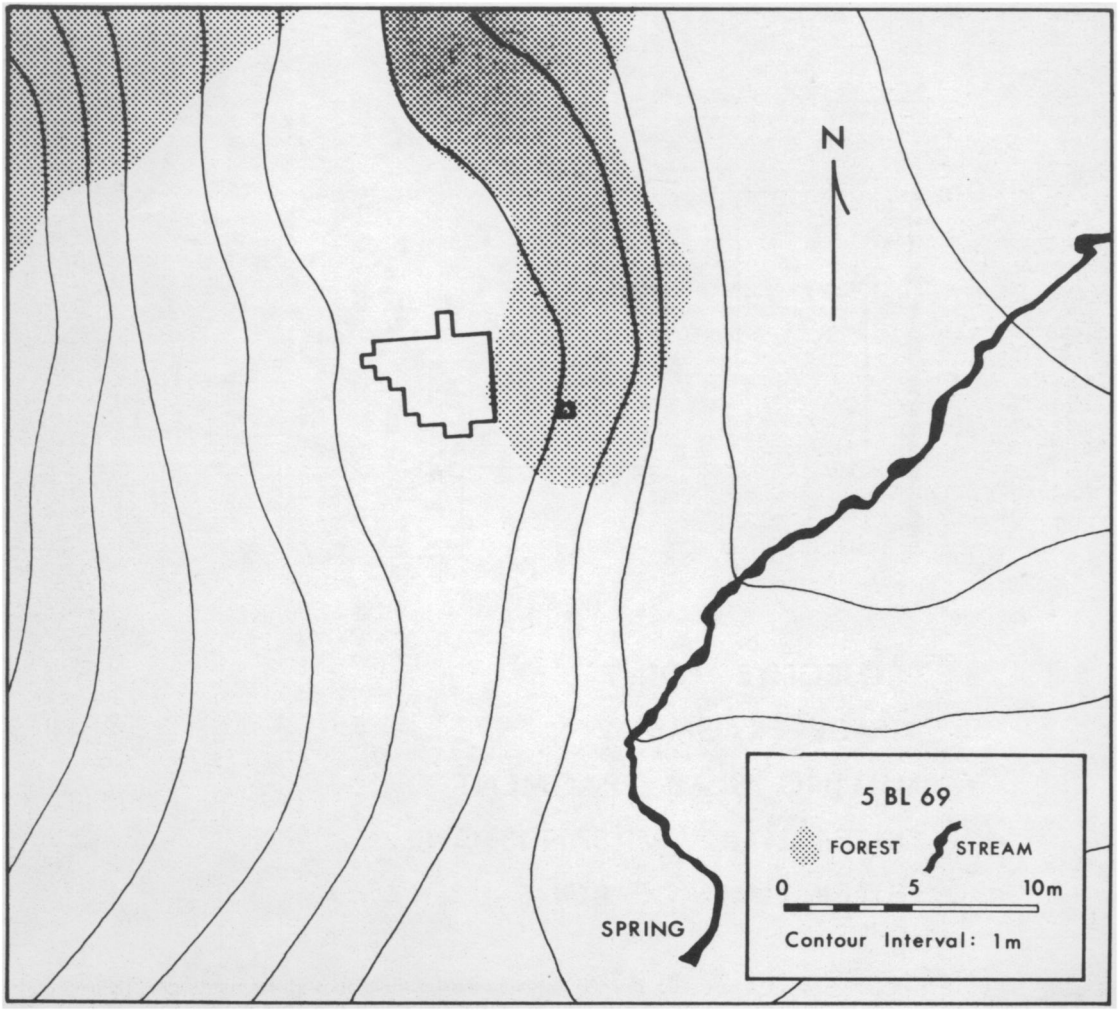

Figure 2: Topographic map of the Scratching Deer site (5 BL 69).

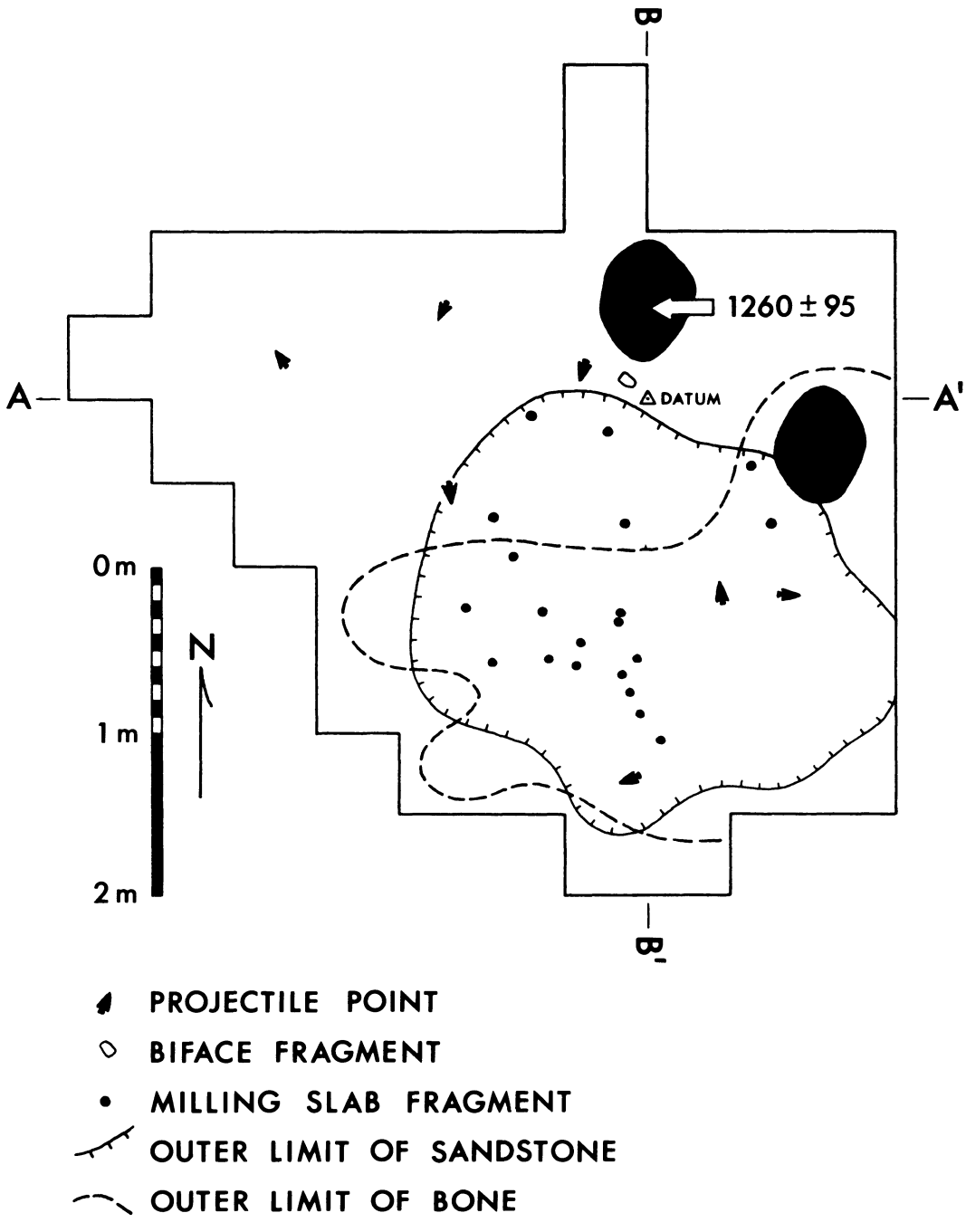

Figure 3. Map of the excavation area at 5 BL 69, showing the locations of hearths and the distribution of artifacts and bone. Although projectile points are evenly distributed throughout the site, milling-slab fragments and scraps of bone occur only in the southeastern half.

STRATIGRAPHY

The excavation area was underlain by glacial till (unit 1), reworked by mass-wasting processes, and weakly oxidized to a dark yellowish brown (10 YR 4/4 moist) color. The unit was poorly sorted, with a gravelly sandy loam texture and large numbers of erratic boulders (Fig. 4). Flecks of charcoal were mixed into its upper 2-3 cm., and two small flakes of chert were recovered less than a centimeter below its upper surface; otherwise, the deposit contained no cultural material.

Units 1 and 2 were separated by an erosion and occupation surface, which formed an abrupt and irregular boundary, locally accentuated by concentrations of charcoal (Fig. 4). A charcoal sample from the fill of a hearth originating at this level was dated at 1260 ± 95 BP (I-3265).

Unit 2 consisted of reworked loess, deposited by slopewash or mass-wasting processes in depressions on the upper surface of the till. The unit was discontinuous, and had a maximum thickness of 12 cm. Its color, when moist, ranged from dark yellowish brown (10 YR 3/4) to dark brown (10 YR 3/3) or very dark brown (10 YR 2/3 to 2/2), depending upon its charcoal content. The deposit was structureless and unstratified, with a loamy texture and a moderately high organic matter content. Stones were rare, but charcoal, bone fragments, artifacts, and chipping debris were abundant; their vertical distribution suggests that they have been heaved upward from the occupation surface as a result of frost-sorting processes.

Unit 3 was not a depositional unit, but rather a thin turf horizon developed in the reworked loess. The unit was very dark brown (10 YR 2/2 moist) in color, and contained scattered chipping debris and small charcoal fragments. Except where absent because of needle-ice erosion, it had a uniform thickness of 2-3 cm. Its lower boundary was smooth and abrupt.

In soil-profile terminology, the site consisted of an A1 horizon (unit 3), an A3 horizon (unit 2), and a IICox horizon (unit 1).

GEOLOGICAL HISTORY

The lowest stratigraphic unit at the site is glacial till, deposited during the Pinedale Glaciation, and probably acquiring most of its terraced topographic form shortly after deposition. The high silt content of the unit (Table 1), compared with other Front Range tills (Birkeland and Shroba 1974, Tables 2, 3), suggests that loess was incorporated into the upper meter of the deposit during intermittent periods of frost disturbance. The absence of

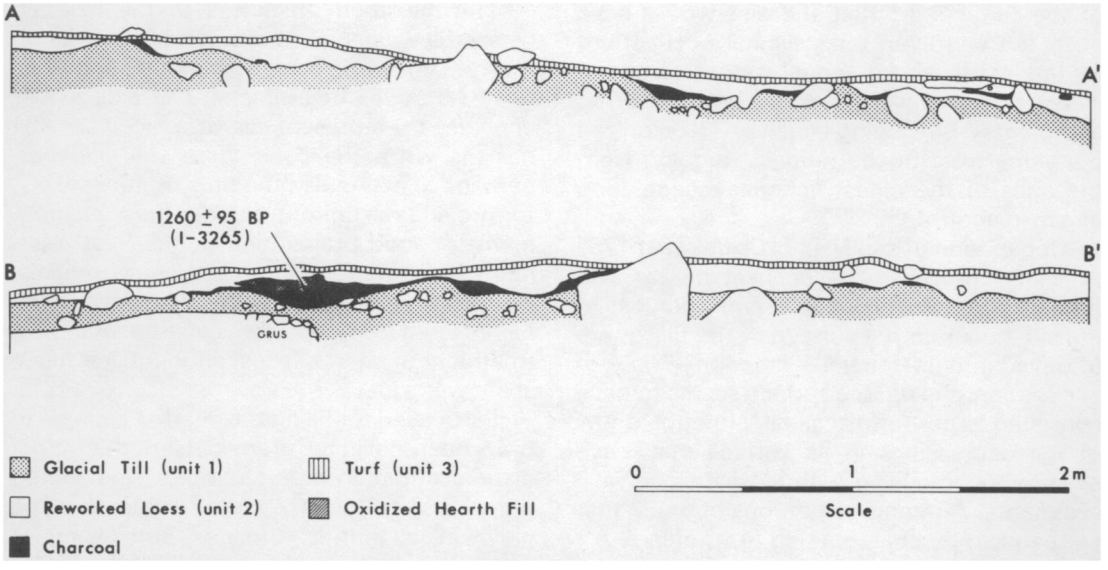

Figure 4: Stratigraphic profiles along E-W and N-S baselines at site 5 BL 69. The locations of the profiles are shown in Figure 3; stratigraphic units are described in the text.

strong B-horizon oxidation is a result of local groundwater conditions.

The erosion surface separating units 1 and 2 represents a considerable period of time for which there is no stratigraphic record. During this interval, the snowbank west of the occupation area must have repeatedly expanded and contracted; windblown silt must have been deposited and stripped away; humus layers must have developed and been destroyed. Erosion would have been particularly intense at times when saturated, vegetation-free soil first emerged from beneath a melting perennial snow cover.

Because lichens are unable to survive prolonged burial by snow, lichenometry can be used to date the close of the most recent interval of perennial snow cover at the site. The largest thallus of *Rhizocarpon geographicum* growing on the snow-accumulation slope directly west of the excavation area has a diameter of 61 mm., suggesting a minimum age of approximately 1450 years (Benedict 1967, Fig. 9). The date is in good agreement with radio carbon evidence that large portions of the floor of the Caribou Lake valley, 7.5 km. to the southwest and at a comparable elevation, were covered with perennial snow during an interval of unknown duration that ended in about 1505 ± 95 BP (I-6382, Benedict 1973, p. 593).

Disappearance of the perennial snowbank exposed raw glacial till (unit 1) at the surface of the terrace. At first the site would have been too wet even for seasonal occupation. As the length of the annual snow-free period increased, however, the soil became drier, and plants — including lichens — recolonized the slope west of the terrace. Judging from the ages of the oldest lichens, revegetation began in about 1450 BP.

Occupation of site 5 BL 69 is dated at 1260 ± 95 BP (I-3265). The deepest milling slab fragments, chipping debris, and charcoal at the site occur on the surface of the till, or are trampled into its upper 1-2 cm. At the time of occupation, the terrace surface seems to have consisted largely of glacial till, although a few of the depressions in its surface may have already become filled with loessal slopewash sediments. Alternately, portions of unit 2 that are overlain by charcoal (Fig. 4, profile A-A') may be the survivors of a much earlier interval of loess deposition.

Because of its silty texture and the scarcity of stones and gravel, stratigraphic unit 2 is inherently fragile. Its preservation is consistent with lichenometric evidence that snowbanks have not been greatly expanded on this part of the valley floor since occupation of the site.

HEARTHS

Two unlined, shallow-basin hearths were encountered during excavation (Fig. 3). Both were elliptical in plan view, measuring about 70 X 55 and 70 X 50 cm. Both contained thick (10-12 cm.) deposits of charcoal, which extended downward from the base of stratigraphic unit 2 into shallow depressions in the upper surface of unit 1. A thick layer of soil directly beneath the hearths was oxidized brown (7.5 YR 4/4) by heat, and an otherwise slightly-weathered granitic boulder in stratigraphic unit 1 was altered to grus where it underlay one of the hearths (Fig. 4, profile B-B').

A peculiar feature common to both hearths was their fill of reddish brown (5 YR 4/4) to yellowish red (5 YR 4/8) silt loam soil, glittering with bleached biotite grains. This strongly oxidized material was underlain by, and partially covered with charcoal (Fig. 4, profile B-B'). The upper surface of charcoal immediately beneath the oxidized soil was greenish gray in color, suggesting reduction of iron at the interface.

The maximum thickness of the oxidized hearth fill was about 6 cm. No pebbles larger than 2-3 cm. were present in the fill, and there were no flakes or artifacts. The oxidized fill appears to represent earth placed in the hearths while the coals were still very hot, perhaps to extinguish the fires or, more likely, to provide a uniform-temperature environment for food preparation or the heat treatment of stone. The arrangement is reminiscent of the oven used by Mandeville and Flenniken (1974) for the experimental heat treatment of chert bifaces, although it is much shallower.

Earth used for filling the hearths appears to have been collected from outside the immediate occupation area. Samples from stratigraphic units 1 and 2 were heated to a red glow in a muffle furnace. Both samples experienced marked changes in color (Table 1), but only the sample from unit 2 duplicated

the color of oxidized material from the hearth. Neither of the two natural horizons contained as much clay as the hearth fill (Table 1), and both were more gravelly. If unit 2 had not yet begun to accumulate when the site was occupied, it would have been necessary to look elsewhere for fine-textured soil.

ARTIFACTS

Projectile Points

Six classifiable projectile points (Fig. 5, *a-f*) and two projectile point tips were found in the excavation area (Fig. 3). Two of the points were collected from the ground surface; the remainder were recovered from depths of 2 to 8 cm. in stratigraphic unit 2. A missing fragment of one of the surface points (Fig. 5, *d*) was found in unit 2 during excavation, thus linking the surface and subsurface materials.

Tip: Sharp to very sharp.

Blade: Ovate to triangular. Symmetrical. Blade edges are unserrated to finely serrated, with 5 to 6 serrations per centimeter. Three of the points are fully worked on both faces; the others are only partially worked, with as much as 35 percent of their surfaces remaining unaltered.

Shoulders: Oblique to strongly oblique.

Hafting Area: Lightly ground, either intentionally or as a result of abrasion during use.

Stem: Slightly to greatly expanding, accounting for 18 to 25 percent of the total length of the point.

Base: Slightly convex to convex. Heavy basal grinding is present on three specimens (Fig. 5, *a-b, e*); the base of a fourth (Fig. 5, *c*) is lightly ground, and two are unground. The unground base of one of the points is formed by two intersecting hinge fractures (Fig. 5, *g*).

Cross-Section: Bi-convex in transverse section. Bi-convex to concavo-convex in longitudinal section.

Dimensions: Length 24-33 mm.; width 16-18 mm.; hafting width 7-8 mm.; thickness 3.3-4.4 mm.

Rock Types: Chert (4), jasper (2), chalcedony (1), petrified wood (1).

Remarks: None of the points appears to have been intentionally heat treated, although several are spalled by burning. Blade edges show little or no evidence of wear.

Preform

A projectile-point preform (Fig. 5, *h*) was collected from the ground surface in 1964. Made of white chert, the preform is comparable in size, shape, and flaking technique to finished projectile points recovered from the site. Flakes of the same distinctive white chert are present in the chipping debris, suggesting that at least some shaping of the preform took place in the occupation area; a flake detached in an effort to thin or remove a prominent striking platform from a lateral edge of the preform (Fig. 5, *h*) can be matched to its original flake scar. After the preform was broken, a sharp natural projection at its base was used as a graving or perforating tool.

Biface Fragment

A fragment of a large chalcedony biface (Fig. 5, *i*) was found in stratigraphic unit 2. The fragment is badly fire-spalled on one face; its only surviving original working edge shows evidence of heavy use. The absence of additional fragments of the biface at the site (except for several probable resharpening flakes), and the presence of use marks along one of the broken edges, suggest that the implement was broken elsewhere, and that this fragment was retained for use as a cutting or scraping tool.

Chipping Debris

Chipping debris from the site included 67 flakes with evidence of wear along the contacts between their striking platforms and dorsal surfaces; these flakes are believed to have been detached during the resharpening of use-dulled tools. Analysis of rock types, edge angles, and striking platform characteristics suggests that at least 5 bifacial cutting tools and 18 bifacial or unifacial scraping tools were resharpened at the site. This is a conservative estimate, allowing for considerable variability along the working edges of individual tools and for differences in color caused by exposure to heat.

An additional 65 flakes showed no evidence of wear along their striking platform-dorsal surface contacts; these flakes *may* have been detached during tool manufacture.

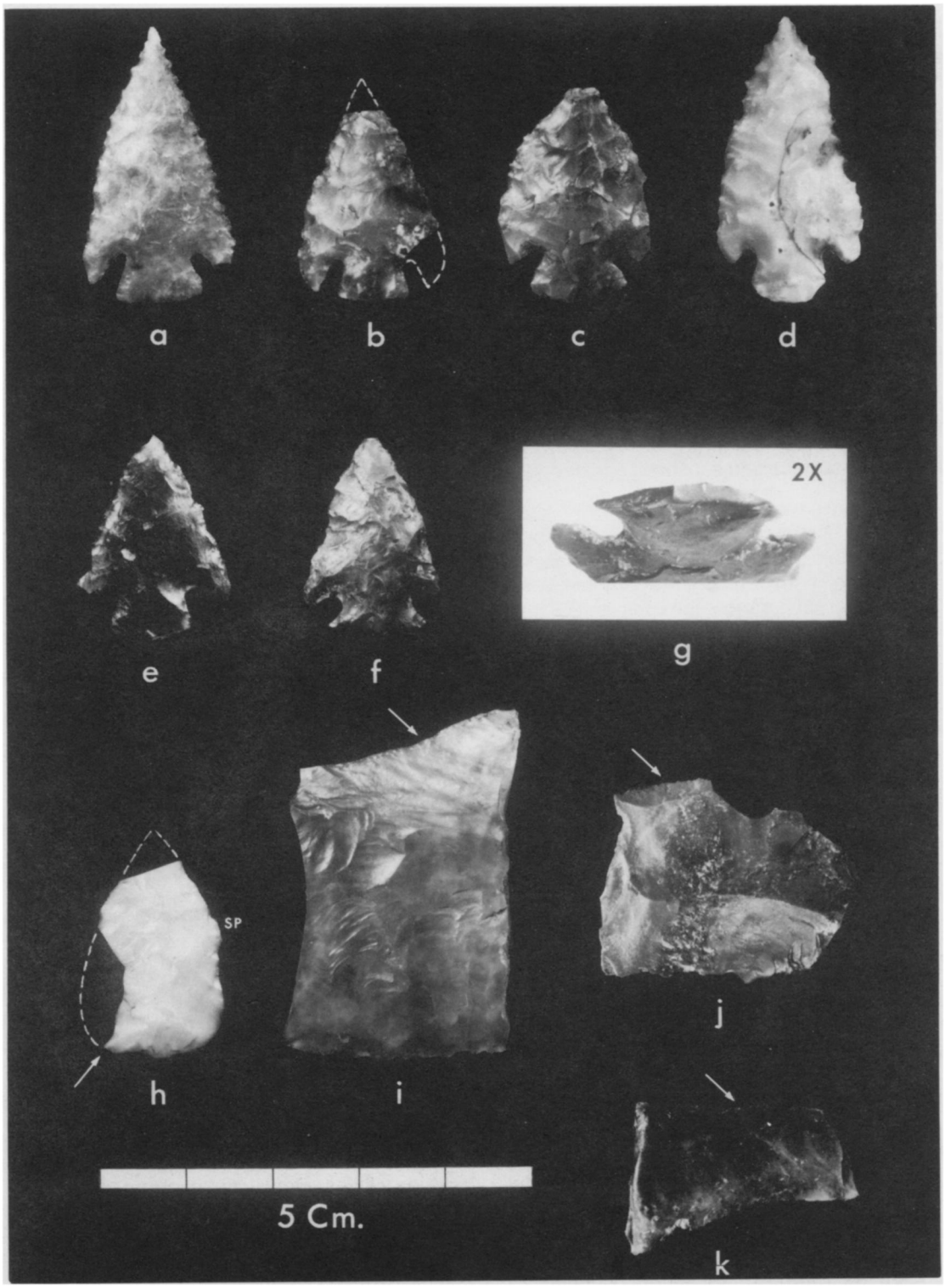

Figure 5: Chipped-stone tools from site 5 BL 69. *a-f,* projectile points; *g,* enlarged view of projectile point base, showing intersecting hinge fractures; *h,* preform, showing remnant striking platform (SP); *i,* biface fragment; *j-k,* utilized flakes. Arrows point to utilized natural edges.

Included in this category were 36 decortication flakes, several of which are shown reassembled in figure 7. By rotating the cortex-covered flake or nodule while removing small, shallow flakes of cortex, the flintknapper wasted little of the underlying workable material. The absence of nearby sources of stone may have encouraged economy in the preparation of cores.

The remaining 180 flakes could not be classified, either because no striking platform was preserved, or because of uncertainty as to whether the juncture between striking platform and dorsal surface showed evidence of wear.

Sixteen of the largest flakes were utilized along one or more blade edges. Examples are shown in Figure 5, *j-k*. Edge angles of 20°-45° suggest that unmodified flakes with sharp natural edges were used as cutting tools when needed, and later discarded.

The preference for cryptocrystalline rock types noted in projectile points from the site was also evident in the chipping debris, less than 2 percent of which was quartzitic. Many of the flakes were crazed and spalled by burning, but only a minor percentage showed systemmatic differences in luster suggestive of intentional heat treatment (see Collins and Fenwick 1974, Fig. 2).

Milling Slab

Twenty-one large fragments of a sandstone milling slab and 63 small pieces of sandstone were recovered from grid squares near the center and southeast corner of the excavation area (Fig. 3). Except for a single fragment that lay on the ground surface, all occurred in stratigraphic unit 2, or in charcoal on the eroded upper surface of unit 1. Depths ranged from 5 to 13 cm. The sandstone is a finely laminated feldspathic quartzite from the Lyons Formation, which outcrops in the Front Range foothills, 25 km. to the east. All of the fragments appear to be part of a single milling slab (Fig. 6), which has been smoothed and faintly striated by use on both surfaces. The thickness of the slab varies from 2.1 to 2.5 cm.; its edges are shaped by crumbling from both faces.

Both the pattern of breakage and the number of fragments suggest that the milling slab was broken intentionally, before the site was abandoned, or else has disintegrated due to repeated freezing and thawing. Experiments at an outcrop of Lyons sandstone northwest of Boulder show that it is virtually impossible to destroy a slab so completely by dropping it on rocks.

Bone

Sixty-seven small, chalky pieces of bone were recovered from stratigraphic unit 2. One of the larger fragments is the distal metapodial of a small ruminant, possibly a deer or mountain sheep (Judith H. Van Couvering, pers. comm.). The remainder are unidentifiable. Bone occurred only in the southeast half of the excavation area; its distribution is indicated in Figure 3.

INTERPRETATION

The location of the site and the types of artifacts recovered suggest that 5 BL 69 was a temporary hunting camp, probably used in conjunction with a game-drive system above timberline on Albion Ridge. With the exception of a single sandstone milling slab, all of the lithic material from the site is related to hunting and butchering activities. A utilized biface fragment and utilized flakes suggest the preparation of meat or hides; functional analysis of chipping debris indicates that a number of cutting and scraping tools were resharpened at the site, and that new tools were manufactured. Although the evidence is circumstantial, there is a possibility that

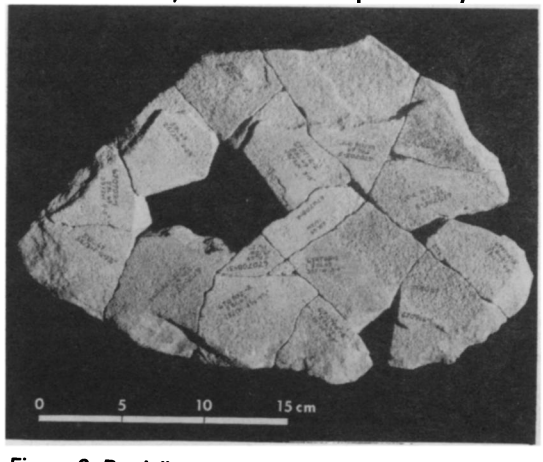

Figure 6: Partially reassembled sandstone milling slab from 5 BL 69. The fracture pattern and number of pieces suggest intentional breakage or destruction by frost.

cortex-covered nodules, or pieces of nodules, were heat-treated prior to initial flaking by burying them in a layer of fine-textured soil surrounded by hot coals. There is no definite evidence of heat treatment during later stages of tool manufacture.

In view of the abundance of abandoned knives and scrapers and of large waste flakes at sites of comparable age in the foothills region, it is surprising that so few tools were discarded at 5 BL 69. Perhaps the answer lies in the small size of the hunting party that camped at the site, and in the short duration of their stay. Perhaps the hunt was unsuccessful, so that butchering tools were not worn out and thrown away. More likely, the explanation lies in the absence of local sources of workable stone, already mentioned in connection with the careful paring of cortex from nodules at the site. Conservation of non-replenishable raw materials would have been essential to a migrant group spending the summer and fall in the high mountain environment.

Radiocarbon dates show that the site was occupied 250 to 300 calendar years before game-drive walls and pits at the Murray site were constructed (Benedict 1975b). The people who camped at Scratching Deer must have hunted elsewhere, perhaps at site 5 BL 68, which overlooks the Scratching Deer site from a location at the extreme eastern end of Albion Ridge (Fig. 8). Game-drive structures at 5 BL 68 are old and subdued, having been built an estimated 5000 to 6000 years ago. Charcoal samples from two circular stone enclosures associated with a drift fence at the site have given radiocarbon ages of 1360 ± 180 (I-2423) and 1230 ± 360 years BP (SI-302), indicating that the drive system was re-used at about the same time that the Scratching Deer site was occupied. The charcoal may or may not have resulted from fires built by hunters who camped at Scratching Deer; the only piece of worked stone found in either of the pits was a small, side-notched projectile point typical of more-recent occupations (Fig. 8).

Projectile points from the Scratching Deer site closely resemble those from the Murray site (Benedict 1975b, Fig. 7), although the latter are 20-30 percent smaller, with a higher incidence of serration and a reduced emphasis on basal grinding. It is uncertain whether these typological differences are time-related.

Closest cultural relationships lie with the Hog Back Phase (Nelson 1971), a Late Prehistoric hunting and gathering complex

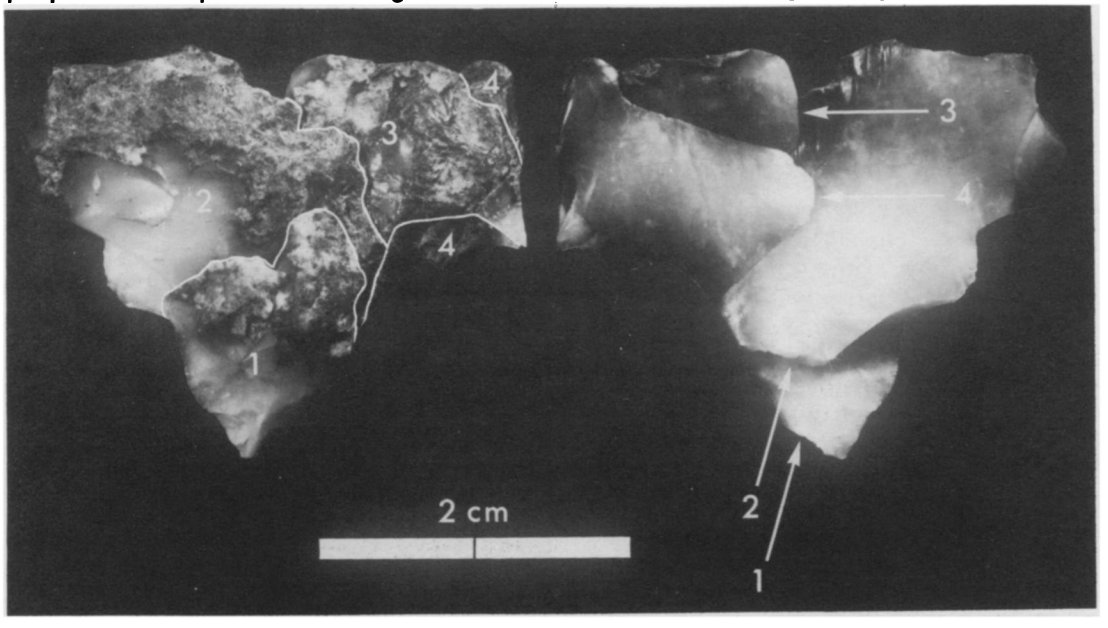

Figure 7: Reassembled decortication flakes from 5 BL 69, shown in dorsal and ventral views. The flakes are numbered 1 through 4, in the order of their removal from the nodule; arrows indicate the direction of force. Beneath its brightly oxidized (2.5 YR 4/8) surface crust, the chalcedony is milky white and waxy. It is the only worked stone at the site that definitely appears to have been heat treated.

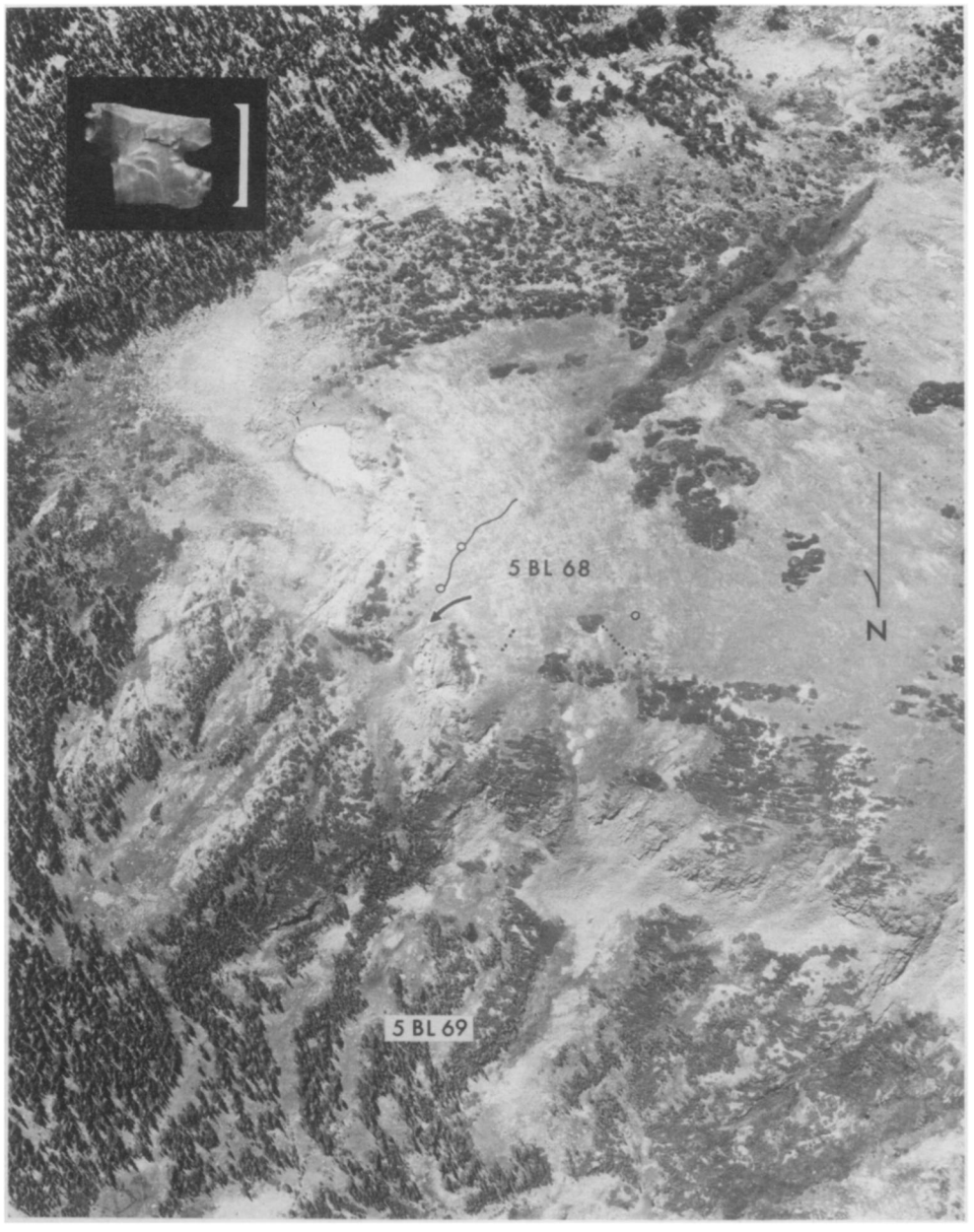

Figure 8: Vertical aerial photograph of the eastern end of Albion Ridge, showing the relationship of the Scratching Deer site (5 BL 69) to game-drive complex 5 BL 68. The Murray site is on the same ridgecrest, but a kilometer farther to the west. Two very rudimentary drive systems are illustrated. The first consists of a low stone drift fence and two circular, stone-rimmed pits, constructed to direct animals northeastward into a confined, grassy couloir (see arrow). The second consists of two converging lines of cairns, built to control the movements of animals climbing to the ridgecrest by means of a second couloir. Projectile points found on the surface near the game-drive walls include styles related to both the McKean and Mount Albion complexes. Re-use of the site at a much later date is indicated by radiocarbon ages of 1360 + 180 and 1230 + 360 years BP, and by the base of a small, side-notched projectile point (see insert) recovered from the colluvial fill of the southernmost pit. The scale bar shown in the insert is 1 cm long. September 1, 1970.

Source of Sample	Color Before Oxidation by Heat	Color After Oxidation by Heat	Texture Sand	Silt	Clay
Unit 1	Dark yellowish brown (10 YR 4/4)	Dark red (2.5 YR 3/6)	52.5-57.4%	33.0-37.5%	9.6-10.0%
Unit 2	Very dark brown (10 YR 2/2)	Yellowish red (5 YR 4/6 to 4/8)	42.8	47.6	9.6
Hearth Fill	Unknown	Reddish brown to yellowish red (5 YR 4/4 to 4/8)	31.9	51.4	16.7

Table 1. Comparison of oxidized soil from the fill of a hearth at site 5BL69 with material from stratigraphic units 1 and 2.

that practiced seasonal transhumance between the crest and foothills of the Front Range. The complex is generally considered to be a manifestation of the Plains Woodland culture, although Husted and Mallory (1967) have argued for Shoshonean relationships. The Scratching Deer site provides no new information relating to this question. To Nelson's (1971: 11) list of Hog Back Phase traits, however, we can add (1) the construction and seasonal use of tundra game-drive systems while occupying sheltered open campsites on the floors of nearby valleys; (2) the conservation of workable stone when far from outcrops, and its profligate use when close to quarry sources; (3) a preference for cryptocrystalline rock types, such as chert, chalcedony, and petrified wood; and (4) possible heat treatment of cortex-covered nodules in especially-prepared, earth-filled hearths.

ACKNOWLEDGEMENTS

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