EXCAVATIONS AT THE CARTER GULCH SITE, SUMMIT COUNTY, COLORADO

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INTRODUCTION

Between June 24 and July 20, 1981 test excavations were carried out by Metcalf-Zier Archaeologists, Inc. (MZAI) at the Carter Gulch site, 5ST161, just southwest of Breckenridge in Summit County, Colorado (Figure 1). These excavations were part of a larger program of survey and site evaluations conducted for area expansion and Special Use Permit renewal at the Breckenridge ski area (Black 1982a; Metcalf 1980). Testing was conducted in two stages: the first (from June 24 to July 2, 1981) evaluated the site's potential eligibility for the National Register of Historic Places; and the second phase, between July 14 and July 20, 1981, further explored the spatial and temporal extent of the site for future planning purposes. The site was evaluated as eligible for the National Register, and about 1300 m^2 in the western portion of the site was defined as most likely to yield buried cultural material.

Field work was under the direction of the author. Michael D. Metcalf was the principal investigator. The site is on the Dillon Ranger District of Arapahoe National Forest; all work was conducted under the provisions of antiquities permits held with the U.S. Forest Service, Region 2. Notes, forms, maps and photographs are on file at the MZAI office in Eagle, Colorado and collected artifacts are curated by the University of Colorado Museum in Boulder.

ARCHAEOLOGICAL BACKGROUND

Previous work in the central Colorado Rockies documents frequent utilization of the montane and subalpine zones over the past 5,000 years by hunter-gatherer groups. In Summit County Late Archaic period remains (ca. 3,000-1,500 BP) are particularly abundant, based primarily on excavations at the Porcupine Peak (Morris personal communication; Marcotte n.d., Morris and Marcotte 1975) and Vail Pass sites (Gooding 1981). Least prevalent are Paleo-Indian to Early Archaic period (pre-5,000 BP) sites. Data to support Benedict's hypothesis (Benedict 1979, 1981; Benedict and Olson 1978) of the mountains as an Early Archaic (Altithermal) refuge area are generally lacking in this area, especially in light of the prevalence of sites dating to after 5,000 BP. It may be that "refugee" populations were largely confined to the Front Range area, or that information is too limited to draw definitive conclusions as yet.

While the body of data on local chronology, settlement patterns and lithic technology is steadily growing, much less is known about the range of variation in prehistoric subsistence and economic strategies, shelter, non-lithic technologies, and inter-regional relationships in the central Colorado mountains. Recent work in Curecanti National Recreation Area (Euler and Stiger 1981; Stiger 1981) and Middle Park (Wheeler and

Martin 1982) suggests a degree of sedentism during the Early to Middle Archaic periods unimaginable among archaeologists only five years ago, and reveals how much we have yet to learn about prehistoric hunters and gatherers in the high country of Colorado.

ENVIRONMENTAL SETTING

The Carter Gulch site is located on the eastern slope of the southern Tenmile Range within the Southern Rocky Mountains physiographic province (Figure 1). It is situated in a natural clearing at an elevation of 3,152 m (10,340) ft), on a small terrace on the west side of Carter Gulch, a permanently flowing tributary of Lehman Gulch which itself is a tributary of the Blue River.

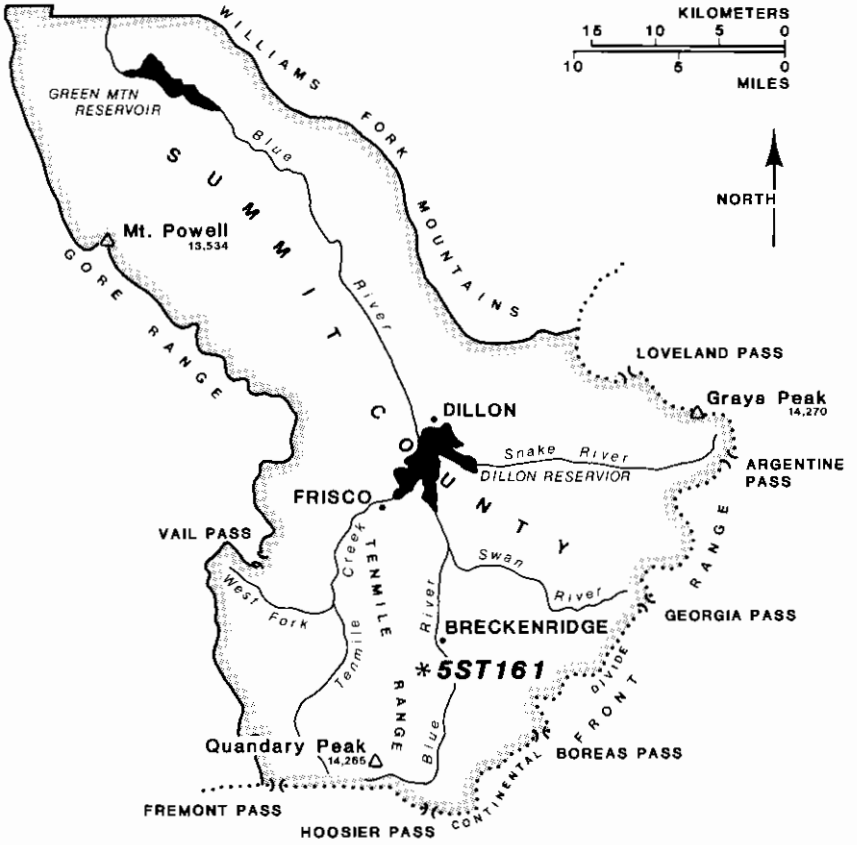


FIGURE 1. Regional location map.

Measuring roughly 160 meters by 56 meters, or about 7,037 m^2 in size, the Carter Gulch site is oriented generally north-south along the stream course (Figure 2). The terrace on which the site is found is quite flat compared to the surrounding terrain, and is formed on a rocky glacial till surface overlain by a thin mantle of loess.

A small meadow of grasses and forbs characterizes the site area. This clearing is surrounded by dense lodgepole pine and aspen woodlands. The stream banks of Carter Gulch support another floral community which includes blue spruce, corn husk lily, willows, and wild strawberries. Several species of mushrooms grow in profusion within the site area after summer rainstorms. Fauna are not now abundant in the area due to past mining activity and the ski area development, but once included a variety of large and small game animals. Bison were roaming the Blue River valley into the mid-nineteenth century, as reported by the explorer Fremont, among others (Gilliland 1980; Walter 1976).

As one would suspect from the elevation and vegetation patterns, the site area experiences typically montane climatic conditions with long, cold winters and short, cool summers. Precipitation approaches 30 inches annually, much in the form of snow, but also in frequent summer rainstorms. Annual temperatures average just above the freezing mark. A pollen column from the Carter Gulch site was analyzed (Weber 1982), but preservation was poor and the only inference made concerning paleoclimates here was that conditions were generally forested in the past.

The Tenmile Range is an asymmetrical anticline mainly composed of Precambrian gneisses, migmatites and schists, and Quaternary glacial drift. The glacial deposits underlying the site area do not include cobbles suitable for use as tool stone. Local geology had a great bearing on variation of the archaeological content within the site area. The loess mantle mentioned above is not uniform across the site area, being thicker in the western portion of the site. An abundance of till cobbles and pebbles litters the eastern half of the site, suggesting the loess has been removed through erosion there, or was deposited at a differential rate according to the local topography. Rodents have concentrated their activities where loess deposition has been greatest, but generally such disturbance is very localized. A charcoal lens at a depth of 0-5 cm across the site provides physical evidence for a forest fire in this area; local histories suggest an 1880 date for this deposit of charcoal and stained earth (Gilliland 1980:49). Finally, freeze-thaw processes have disturbed the remains to a minor extent. Disturbed profiles were observed in only a few test units, leaving features and most artifact levels relatively intact.

METHODS

Although excavation of 5ST161 was conducted in two phases, excavation methods did not differ. Initially, a resurvey of the site area was conducted to locate any materials exposed since 1980: all visible surface remains were collected when the site was first discovered (Metcalf 1980). All surficial lithics were point plotted relative to a wooden stake

which served as the primary site datum. Ten 2 m x 2 m test squares and two unit extensions totaling 2.5 m^2 were excavated; thus, 42.5 m^2 in formal units were opened.

Test squares were distributed to cover all parts of the site area. Units were located in areas of apparent soil depth where surface concentrations of flakes were present, or where ski area construction activities were planned. Initially excavation was by arbitrary 10 cm thick levels below a 5 cm level removed at the surface. Unusually clear natural stratigraphy was present, however, and most subsequent test squares were dug in natural levels. Most dirt was screened through ¼" hardware cloth but areas of special interest were sifted through finer mesh screen.

Five pollen samples taken at 10 cm intervals in test square F (Figure 2) were analyzed (Weber 1982). Also, four soil samples for flotation of organic remains were collected within and adjacent to two features. Both pollen and flotation samples were processed at the Center for Western Studies in Flagstaff, Arizona (ibid.). Three samples of charcoal for radiocarbon dating were collected from the two features and sent to Beta-Analytic, Inc. in Coral Gables, Florida for analysis.

In addition to formal 2 m x 2 m units, shovel testing was conducted at 5 m intervals along axes measuring 0°, 40°, 145°, and 180° from the primary datum; 44 such tests 30-40 cm in diameter were dug. These shovel tests were dug in natural levels with all fill screened through ¼" hardware cloth. Three shovel tests also were dug south of Feature 1 in test square D, and two others were dug 35 m west and 38 m southwest of the primary datum on the crest of a low morainal ridge. Laboratory analyses included an edge wear analysis on lithic tools using a 5X and 30X magnification hand lens and an Olympus SZ Dissecting Zoom binocular microscope at 30X, in addition to the necessary washing, cataloguing and drafting.

SITE DESCRIPTION AND FEATURES

As mentioned above, the Carter Gulch site covers some 7,037 m^2 on the west side of the creek. Surface indications are limited to a very sparse scatter of chert, chalcedony and obsidian flakes and tools; no ground stone has been recovered thus far. The open and wet nature of the local environment precludes the preservation of non-lithic artifacts; for example, no bone was found to supplement the stone tool evidence (projectile points, bifacial knives, etc.) for a hunting emphasis. A small corner-notched projectile point of light gray chert (Figure 3a) found with the surface scatter provides the sole evidence for a late Prehistoric occupation at the site, thought to date between ca. 1550-650 BP (AD 400-1300; Black 1982a:71, 81). Obsidian, recovered in abundance from subsurface levels, appears to date to the earlier of two Archaic period occupations.

Both Archaic occupations are represented by buried lithic concentrations adjacent to probable hearths, and both occur in the same stratigraphic soil level. Because most of the eastern half of the site area has experienced more erosion than the western half (sheet wash is one

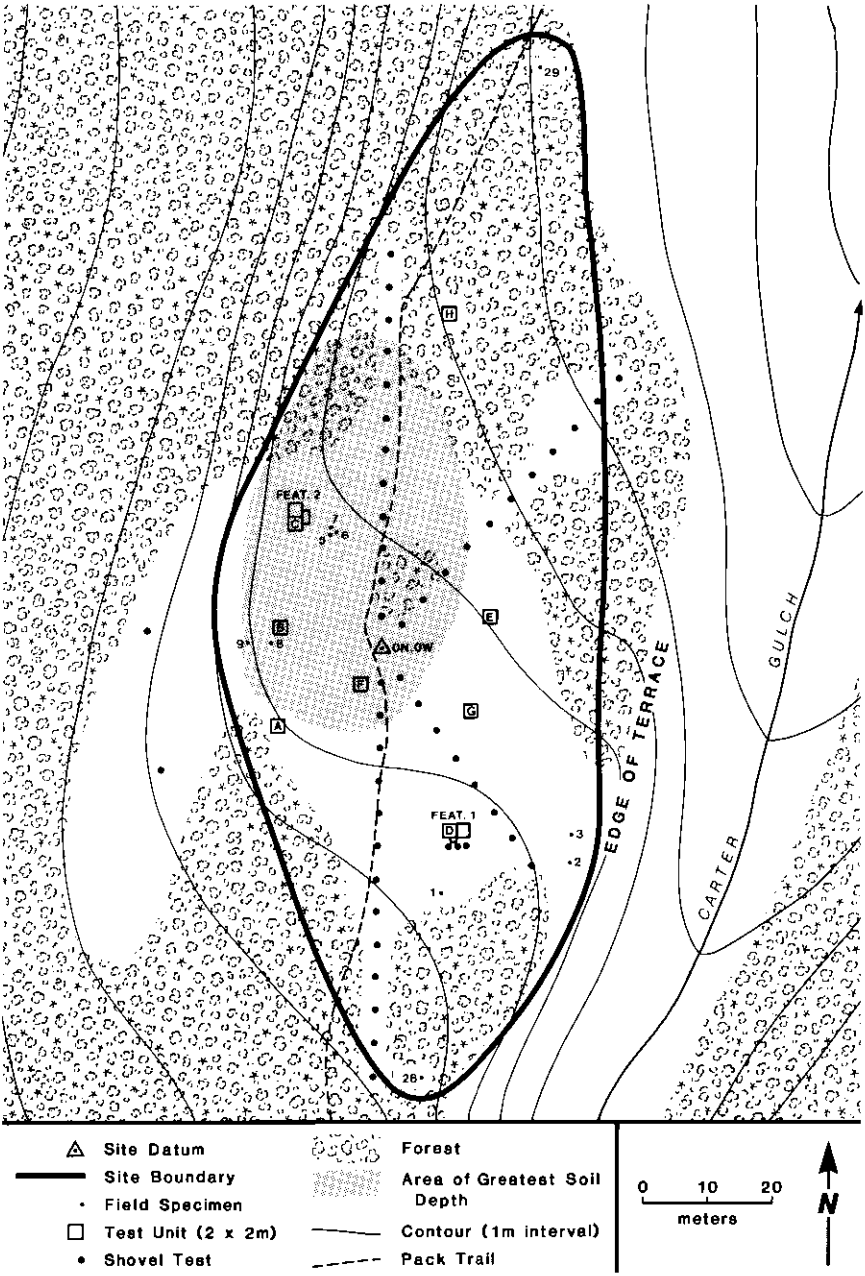


FIGURE 2. Site map, site 5ST161.

explanation, based on local site topography), little loess is present there and artifacts are both sparsely distributed and confined to upper soil horizons. Where the Archaic components are preserved, they are situated in the lower portions of the loess deposit, on top of the glacial till surface. In areas of deeper soil, the loess-till sequence can be differentiated into eight natural soil strata (Figure 4), although individual test units did not exhibit more than five of these. Most commonly, four soil levels were observed (Levels 1, 2, 4, and 7 in Figure 4) with both Archaic occupations found mainly in the lower portions of the third level. All 49 shovel tests failed to yield cultural material, suggesting that overall artifact density on the site is fairly low.

A Late Archaic period activity area is present in the southern site area around test unit D. Excavation of 8.5 m^2 in this area revealed a thin, basin-shaped lens of charcoal interpreted as a hearth (Feature 1; Figure 5), and associated chert and chalcedony artifacts, mainly at a depth of 15-20 cm. Lithic remains were not abundant, numbering only seven items. Included are three chalcedony retouch flakes, two chert interior flakes, a utilized white chert flake, and a dendritic white chalcedony biface tip (Figure 3d). Chronological data are limited to a radiocarbon date from Feature 1 of 1,940 $\pm$ 90 BP (Beta-3019), corrected to 1,953 $\pm$ 97 BP (3 BC; Damon et al. 1974:355, 365). Functionally, the biface tip and utilized flake would suggest processing of faunal resources took place here, but analysis of one flotation sample from the soil matrix of Feature 1 (Weber 1982) also yielded 83 burned seeds of the mustard family (Cruciferae). Thus, the Late Archaic occupation here has left evidence of a camp site where tool finishing/maintenance, and processing of both floral and faunal resources may have occurred. Evidence for utilization of faunal resources is less clear-cut than for floral material, however.

Fifty-five meters to the northwest of the Late Archaic period activity area in the vicinity of unit C (Figure 2), another hearth-lithic concentration association was located. Excavation of 10 m^2 in three test units revealed an Early Archaic period hearth associated with abundant lithic artifacts, especially obsidian. The hearth (Feature 2; Figure 6) is cobble-lined and yielded two radiocarbon dates averaging 5,138 $\pm$ 62 BP (5,000 $\pm$ 100 BP [Beta 3020] and 5,230 $\pm$ 80 BP [Beta 3021]), corrected to 5,929 $\pm$ 123 BP (3,979 BC; Damon et al. 1974:361, 365). Analysis of three flotation samples from soil in and just above the feature also revealed 146 burned seeds of the mustard family (Cruciferae), 15 burned seeds and seed fragments identified as false buckwheat (*Eriogonum*), two uncharred sedge seeds (*Carex*), and a tiny retouch flake. As noted above, obsidian was recovered in abundance here, numbering 108 flakes and tools; also found were nine chalcedony flakes and a heat-treated chert projectile point fragment (Figure 3c). An obsidian bifacial knife edge fragment (Figure 3e) found in test unit G 20 m north of the Late Archaic activity area is thought to be related to the Early Archaic occupation.

Functionally, the Early Archaic component greatly resembles the Late

Archaic component. Lithic artifacts such as a projectile point, bifacial knife and utilized flakes suggest faunal procurement and processing, while flotation data provide strong evidence for plant utilization. Chronologically, the radiocarbon dates support the interpretation of the side-notched point as an Early Archaic form. One such well-known named type is the Hawken style found both north (Frison et al. 1976) and west (Holmer 1978) of Colorado, with similar points known from the mountains (cf. Benedict 1981:104; Gooding 1981:24). Thus, the evidence indicates that the Carter Gulch site was occupied as a short-term camp at least three times, in the Early Archaic, Late Archaic and Late Prehistoric periods. Lithic and macrofaunal evidence suggests tool manufacture and maintenance, and processing of both floral and faunal resources, were primary site activities.

Material Culture: The artifact assemblage from the Carter Gulch site is entirely limited to chipped stone tools (Table 1) and debitage. Obsidian composes the bulk of items with 118 of 158 (75%) artifacts made of that material. Next is chalcedony (26 artifacts or 16%), then chert (13 artifacts or 8%) and quartzite (one flake, 0.6%). Seven flakes (4%) showed evidence of heat-treatment, with gray and brown chert almost exclusively subjected to thermal alteration. Several flakes, particular-

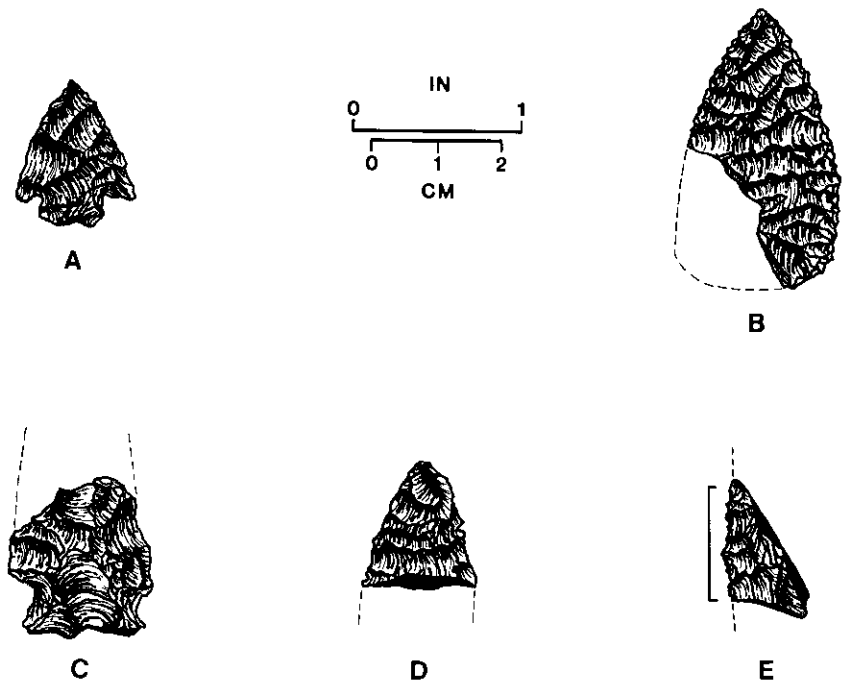


FIGURE 3. Lithic tools from 5ST161.

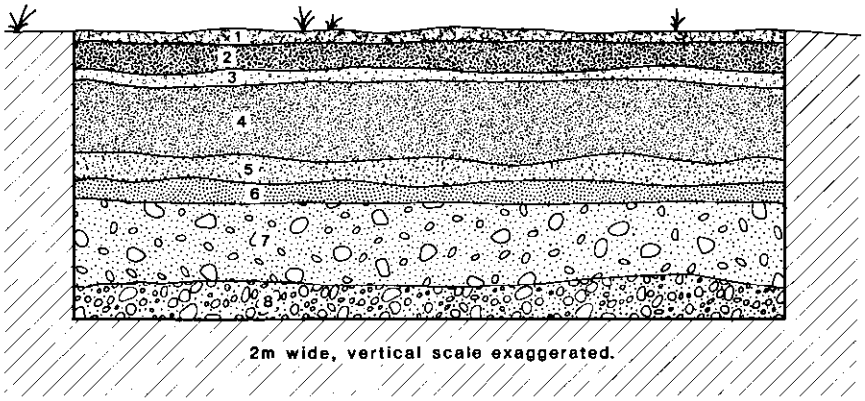
ly from the ground surface and likely related to the Late Prehistoric component, are made of a grayish white chalcedony commonly found in the Middle Park area (Gooding 1981:19; Jones 1979:41-50, 64-66; Lischka and Black 1979:46-47). Similar material also was heavily represented at the Porcupine Peak site (Marcotte n.d., Morris personal communication). The overwhelming predominance of small interior flakes in the assemblage points toward tool finishing and maintenance as major site activities.

As obsidian was prevalent at 5ST161, clearly the Early Archaic occupants were in contact with other groups who had access to obsidian outcrops, or had visited outcrops themselves. The closest well-known source of obsidian to this area is at Cochetopa Dome in northwestern Saguache County, 150 km to the southwest (Cassells 1978:43). That source recently has been subjected to trace element analysis in Idaho (Stiger personal communication). However, other obsidian sources in the San Juan Mountains (Baker et al. 1980:54-56; Burns 1981), western Utah (Nelson and Holmes 1979), northwest New Mexico (Baker and Winter 1981), western Wyoming (Burns 1982, Frison 1978:227), the eastern Rabbit Ears Range (Spock 1928), and the Upper Arkansas Valley (Guthrie 1981)—or other as yet unidentified sources—may have been the origin of the obsidian at 5ST161. Functional preferences in raw material types also may have been practiced by the Early Archaic inhabitants here. Discovery of a chert projectile point fragment and obsidian knife fragment (Figure 3c and e) associated with the Early Archaic component leads to a hypothesis that microcrystalline materials were preferred as procurement implements while obsidian was favored in tools used to process faunal resources. More work is needed to test whether the hypothesis is correct, or whether that phenomenon is a result of an incomplete lithic tool sample.

DISCUSSION

Information from the Carter Gulch site has widened the known subsistence base of Archaic period groups in the Colorado mountains. Macrofloral and palynological evidence from other high altitude sites (e.g., Gasser 1981; Scott 1981a, 1981b, 1981c; Scott and Seward 1981) suggests utilization of prickly pear cactus, beeplant, sagebrush, bulrush, ricegrass, and wheat-grass by hunter-gatherer groups. At Piedra Pass (Scott and Seward 1981), burned and partially burned seeds of tansy mustard, pigweed, strawberry blite, huckleberry, wild onion, buckbrush, currant, groundcherry, and tufted hairgrass were recovered, but their presence could not be definitively ascribed to cultural activity. An even wider range of charred seeds was recovered from four undated sites, 5GR619-622, particularly including goosefoot, cheno-ams, speedwell, stargrass, huckleberry, clover, honeysuckle, mint and mallow (Klesert and Seward 1982).

Discovery of seeds of the mustard family from both Early and Late Archaic period contexts at the Carter Gulch site compliments the tenuous findings from Piedra Pass, where tansy mustard (*Descurainia*



HORIZON	LEVEL	DESCRIPTION
O	1	Nongravelly dark brown to dark grey silt, recent charcoal, forest duff and decaying organic matter with sparse artifacts.
A1	2	Slightly gravelly medium brown silt with patches of recent charcoal and sparse artifacts.
E	3	Gravelly light brown silt loam (leached E horizon).
B2	4	Gravelly to stony reddish-brown silt loam with artifacts (locally abundant in lower portions).
B3	5	Gravelly to stony light reddish-brown silt with artifacts.
C1	6	Gravelly to stony purplish-gray silty clay with sparse artifacts.
C2	7	Very gravelly to cobbly tan clay, culturally sterile.
C3	8	Extremely gravelly to bouldery grayish-brown heavy sandy loam, slightly weathered glacial till, culturally sterile.

FIGURE 4. Site 5ST161, composite profile of soil units.

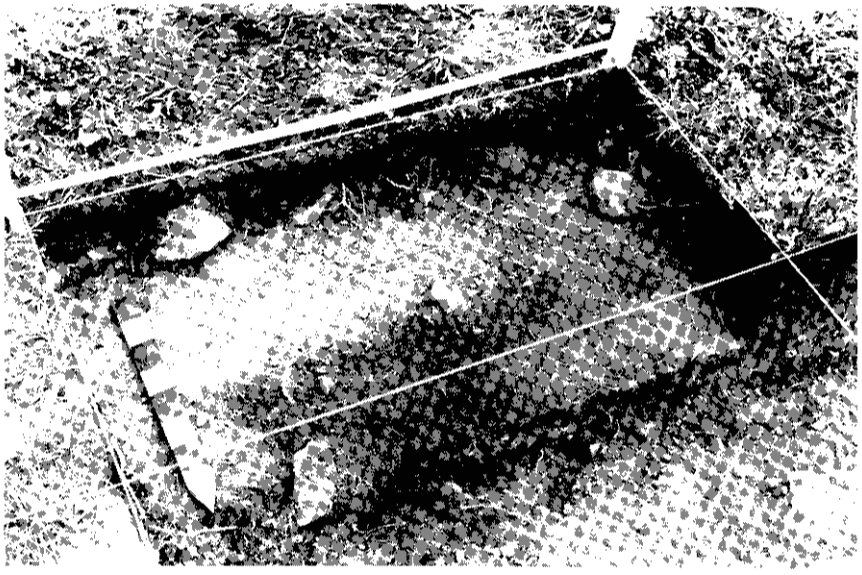


FIGURE 5. View south-southwest of test square D-SE extension at a depth of .32 m bd. Feature 1, charcoal lens, is clearly visible in the lower portion of the photograph. Scale on north arrow is 5 cm.

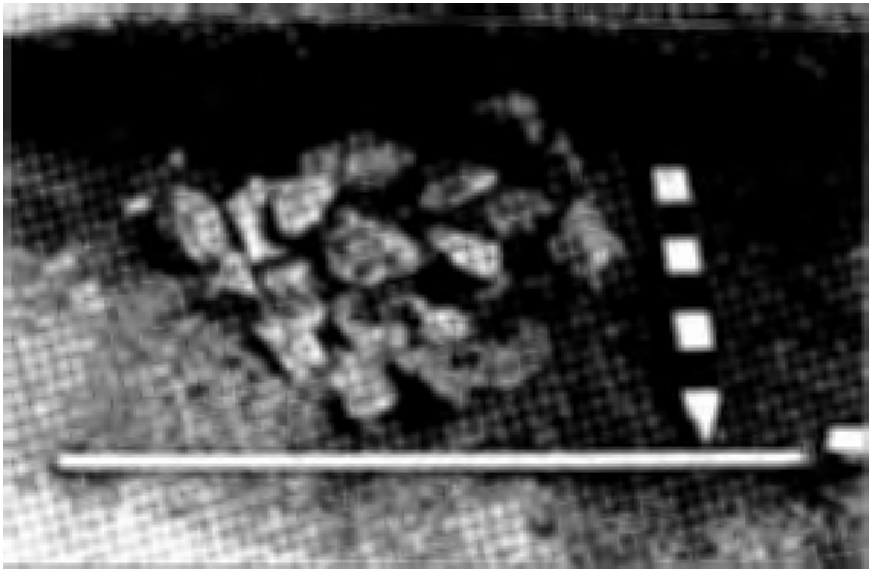


FIGURE 6. South view of Feature 2 hearth radio-carbon dated at 5,929 ± 123 years BP. Scale on north arrow is 5 cm.

spp.) was one genus of the Cruciferae identified (Scott and Seward 1981). Young shoots of tansy mustard can be used as a potherb, and the Indians ground the seeds into a meal called pinole that "was cooked into a mush, made into bread, or used to thicken soup" (Harrington 1967:308). Use of false buckwheat (*Eriogonum* spp.) has not been reported in the Colorado mountains, but ethnographic information indicates it was used by Hopi women as a menstruational medicine and to expedite childbirth (Weber 1982:141; Whiting 1950), and by the Western Shoshoni to ameliorate stomach disorders (Steward 1938:311).

The presence of charred mustard seeds in Early and Late Archaic hearths of different styles at Carter Gulch supports the findings of Hand and Gooding (1981) at Vail Pass, where no functional or chronological correlation was detected among the five defined hearth types. Hearth morphology has been used as a chronological indicator to a very limited extent on the Colorado Plateau (e.g., Schroedl 1980), but thus far has not been successfully applied in chronological or functional analyses of mountain sites in Colorado.

Although the palynological analysis at the Carter Gulch site was limited by poor preservation (Weber 1982:133), more favorable microenvironments for pollen preservation potentially exist within the site area should further work take place there. One line of evidence regarding paleoenvironmental reconstruction has been followed. The corrected Early Archaic date of 5,929 $\pm$ 123 BP from Feature 2 provides a maximum date for loess deposition in the western portion of the site area. Butzer (1971:198-199) indicates that loess can be deposited during times of glacial fluctuations. If the climatic sequence outlined in Benedict (1981:115-119) is accurate, then loess at the Carter Gulch site may have begun to be deposited following the Triple Lakes advances between 5,000 and 3,000 years ago. That a loess unit also overlies Feature 1 dated at 1,953 $\pm$ 97 years BP shows that further deposition may have occurred following the Audubon and/or Arapahoe Peak advances of Neoglaciation. Benedict (1981) describes several episodes of Holocene loess deposition in the Front Range west of Boulder, Colorado.

In addition to providing information on functional preferences in raw lithic materials, the Early Archaic artifact assemblage also includes evidence of heat-treatment of a light brown chert. Irwin-Williams and Irwin (1966-60) found numerous heat-treated artifacts of a "fine yellow chert" in Zones E and F of the Magic Mountain site, i.e., in an Early Archaic context. Black (1982b) noted a statistically significant trend in heat-treatment of yellow to brown cherts in the Cottonwood Pass area of central Colorado, some associated with Early Archaic diagnostic artifacts. Thus, the heat-treated brown chert side-notched point fragment from Carter Gulch (Figure 3c) associated with a date of 5,929 $\pm$ 123 BP supports these other data. Eventually it may be possible to use this lithic material as a horizon marker if a distinct source for the chert can be found. Whether or not the Early Archaic occupation of the site represents part of an Altithermal mountain refuge population (cf. Benedict 1979, 1981:113) awaits further definition of the effect(s) of the warming trend on groups in areas adjacent to the Colorado mountains.

The Late Archaic information from the Carter Gulch site adds to the growing body of evidence for relatively intense occupation of the Summit County area at that time. In addition to numerous surface finds of diagnostic Late Archaic projectile points, Gooding (1981) reports a substantial Late Archaic occupation at the Vail Pass site (5ST85), where 15 of 30 dated hearths yielded radiocarbon dates between 2,860 ± 80 (Tx-2648) and 1,730 ± 100 years BP (WSU-1748; both are uncorrected dates). Another important Late Archaic site in Summit County is the Porcupine Peak site (5ST98; Marcotte n.d.; Morris personal communication; Morris and Marcotte 1975) on the Snake River. There, distinctive corner-notched projectiles with serrated blades have been found, and several Late Archaic radiocarbon dates received. However, the subsistence information from Feature 1 at Carter Gulch is an important addition to our understanding of Late Archaic adaptive strategies in the high country.

CONCLUSIONS

Test excavations at the Carter Gulch site, 5ST161, southwest of Breckenridge in Summit County, Colorado revealed evidence of three prehistoric occupations. The site area was utilized as a short-term camp at least during the Early Archaic, Late Archaic and Late Prehistoric periods. Lithic assemblage data suggest that procurement and processing of faunal resources occurred during all three occupations, while macrofossil evidence from two features indicates that plants of the mustard family and false buckwheat were also utilized—mustard during both Archaic occupations. Tool finishing and manufacturing were other important activities at the site, with obsidian comprising over 90% of the raw material used by the Early Archaic occupants. Poor pollen preservation prevented definitive paleoenvironmental assessments, but radiocarbon samples provided maximum ages for at least two episodes of loess deposition at the site. Different radiocarbon age determinations on two hearths of different construction yielded similar macrofossil data, supporting previous evidence for a lack of correspondence between hearth morphology and function. These data together make the Carter Gulch site a valuable source of information on prehistoric subsistence and lithic technology in the Colorado mountains.

ACKNOWLEDGMENTS

Work at the Carter Gulch site was made possible through funds provided by the Aspen Ski Corporation, through a contract with Metcalf-Zier Archaeologists, Inc. Thanks go to the U.S. Forest Service personnel in Frisco, Breckenridge Ski Area manager Jim Gill, and principal investigator Michael Metcalf for their cooperation, support and advice. This manuscript benefitted from critical readings by Michael D. Metcalf.

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