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ARCHAEOLOGICAL INVESTIGATIONS AT THE WILBUR THOMAS SHELTER, CARR, COLORADO

Assembled and Edited by

DAVID A. BRETERNITZ

ABSTRACT

The Wilbur Thomas Shelter, located near Carr, Colorado, contains evidence of a series of six occupations: Cody Complex, Mountain Complex, Lower Level McKean Complex, Upper Level McKean Complex, Woodland Complex, and Historic occupation. The various authors discuss the following topics: the stratigraphic profile, physical properties of the stratigraphic profile, features, tool analysis, projectile point provenience, ceramics, relationships to other sites, and site utilization and ethnographic analogy.

INTRODUCTION

by

DAVID A. BRETERNITZ

LOCATION AND BACKGROUND

The Wilbur Thomas Shelter, designated as 5WL45 in the University of Colorado Museum Archaeological Survey, was brought to our attention by Charles E. Nelson and Bruce Stewart. It is located in the SW¼ of Section 5, Township 10 North, Range 67 West, four miles southwest of the town of Carr, on the Spring Creek Ranch of Mr. Wilbur Thomas. Permission to excavate was kindly granted by Mr. Thomas.

This report was written by members of a graduate seminar in archaeology on the basis of the excavations by the class personnel during the spring of 1969 and previous testing by Nelson and Stewart during the summer of 1968. The various papers have been edited and appear under the authorship of the particular students. In addition, three other students participated in the seminar but because of duplication of subject matter and/or lengthy reports it was impossible to include them in this publication. Those student papers, as well

as all other excavation records and recovered materials, are on file at the University of Colorado Museum and consist of the following: Daniel W. Martin, "Regional Physiography"; Larry V. Nordby, "The Stratigraphy of the Wilbur Thomas Shelter"; and Esther P. Hammer, "Lithic Analysis of the Wilbur Thomas Shelter." In addition, the raw data for Miller's paper on physical properties and Hammer's analysis of the lithic detritus are also on file.

Dr. James B. Benedict accompanied the group much of the time and, with Bryon Olson, describes the stratigraphic profile of grids 2S/2E and 2S/4E. Stephen Zeiler and Douglas Scott also participated in the excavations. Jil Nilson, George McLellan, and Jerome Rose helped in the field mapping of the final site map and final backfilling.

All the material recovered and all records of the initial excavation by Nelson and Stewart, with the consultation of Ruthann Knudson, were kindly turned over to the University of Colorado for final analysis.

EXCAVATION PROCEDURE

The baseline used by Nelson and Stewart was reestablished and, essentially, a system of 2-meter grid squares was staked out (Fig. 1). The students used a variety of excavation techniques and controls as an experiment to determine which methodology would produce the maximum information. All grids were completely screened through quarter-inch mesh, but some grids were cleared solely by trowel work and others were hand-shoveled until features were encountered. Students kept individual notes and did all the recording.

Grids for excavation were selected on the basis of information provided by Nelson and Stewart and in order to leave a sizeable portion of the site undisturbed.

A dry-laid rock wall outside the cave to the northwest was also tested, but the absence of prehistoric material suggests that this feature is of recent origin (see Figs. 1-2).

All excavation units were completely backfilled.

THE STRATIGRAPHIC PROFILE OF GRID SQUARES 2S/2E AND 2S/4E

by

JAMES B. BENEDICT AND BRYON OLSON

INTRODUCTION

Figure 3 illustrates the stratigraphy along the northwest walls of grid squares 2S/2E and 2S/4E. The profile has been divided into stratigraphic units which are described below. Soil color is derived from Munsell (1954).

DESCRIPTION OF UNITS

Unit 1. Dark brown (10YR3/3) to very dark brown (10YR2/3 dung

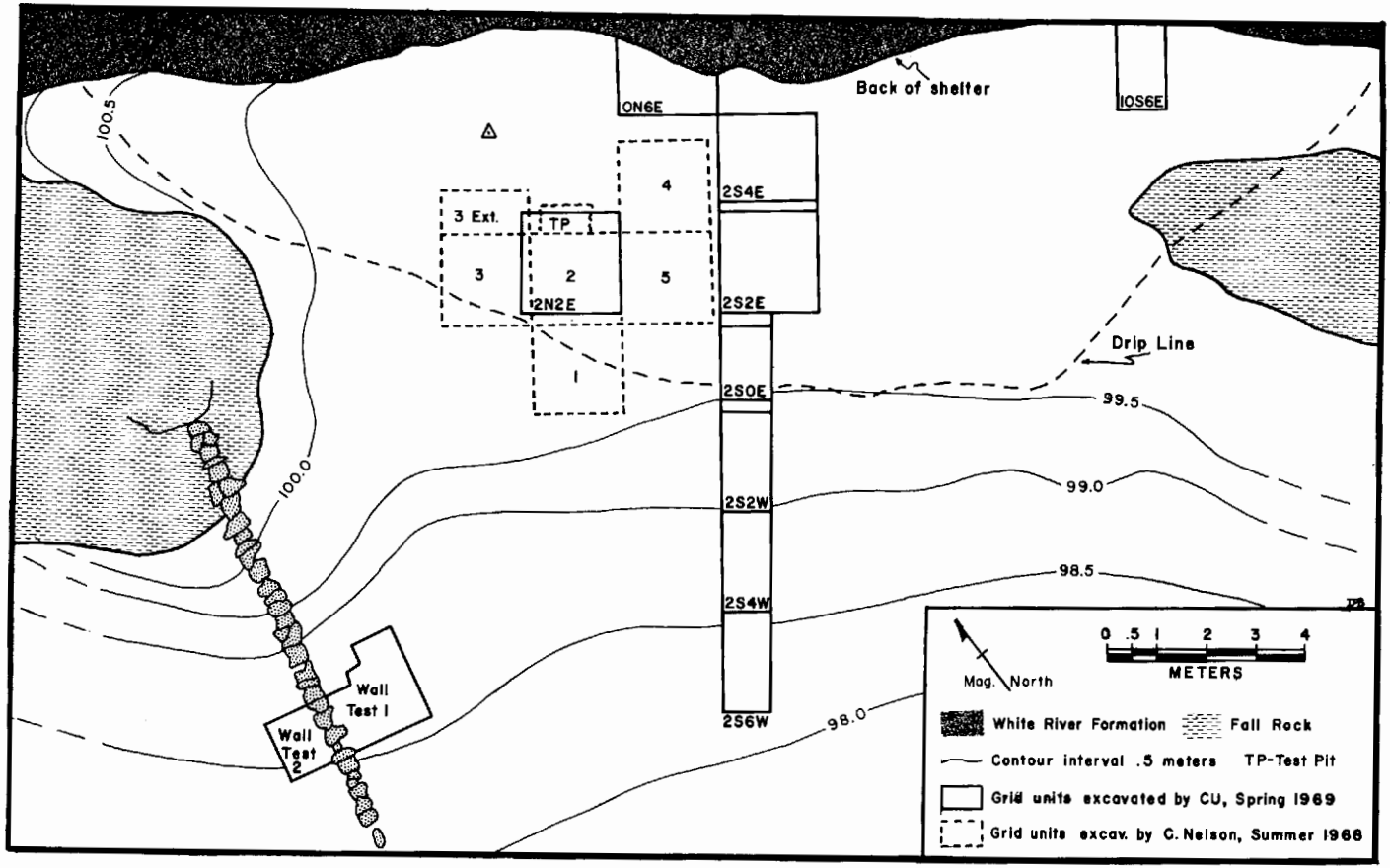


FIGURE 1. Site map of Wilbur Thomas Shelter.

FIGURE 2. Wilbur Thomas Shelter, looking from the west.

layer, divisible into a loose upper unit and a compacted lower unit. Contains fine gravel derived from roof fall.

Unit 2. Brown (10YR4/3-5/3) indurated sandy clay loam. Vertically jointed, with scattered flecks of charcoal. Dries to pale brown (10YR6/3).

Unit 3A. Lens of dark yellowish brown (10YR4/4) sandy loam, essentially free of gravel. Firm and structureless, with scattered charcoal.

Unit 3B. Dark yellowish brown (10YR4/4) loamy sand, grading to a sandy loam near the rear of the shelter. Very gravelly and stony, with moderately developed blocky structure and scattered charcoal. More compact than overlying and underlying units.

Unit 3C. Lens of very dark brown (10YR2/3) sandy loam, probably an extension of Unit 3D.

Unit 3D. Very dark brown (10YR2/3) to dark brown (10YR3/3) loamy sand, grading into a sandy loam near the back wall of the shelter. Very gravelly and stony. Structureless to weakly blocky. Looser than Unit 3B, particularly in areas of rodent disturbance. The irregular lower boundary of this unit is a result of tunneling by rodents.

Unit 3E. Lens of brown (10YR4/3) sandy loam. Structureless, with disseminated charcoal. Differs from overlying and underlying material only in color.

Unit 3F. Discontinuous very dark grayish brown (10YR3/2) to dark brown (10YR3/3) sandy loam. Structureless, with abundant charcoal.

Unit 4A. Lens of brown (10YR5/3) gravelly sandy loam. Weak subhorizontal stratification suggests deposition by slopewash. Scattered charcoal. Weakly blocky structure.

Unit 4B. Discontinuous brown (10YR4/3-5/3) sandy clay loam. Firmer than underlying and overlying horizons, with relatively little gravel, but numerous blocks of decomposed sandstone. Moderately well developed blocky structure. Contains disseminated charcoal.

Unit 4C. Brown (10YR4/3) to pale brown (10YR6/3) stony, gravelly, sandy loam. Color variation is a result of varying charcoal content. Moderate blocky structure. Contains blocks of decomposed sandstone.

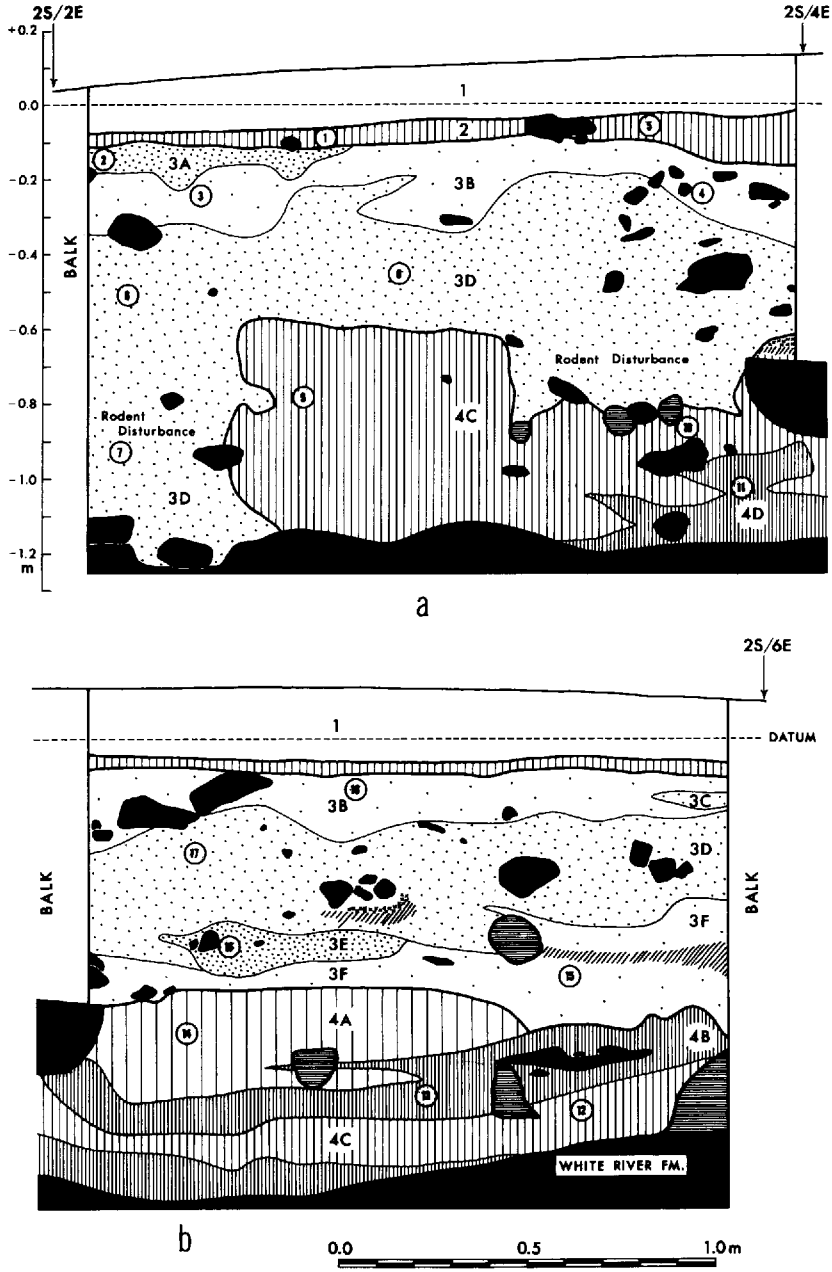


FIGURE 3. Stratigraphic profile along northwest wall of grid squares 2S/2E and 2S/4E. a, 2S/2E; to 2S/4E; b, 2S/4E to 2S/6E which fits on right edge of a. Unit descriptions given in Benedict text. Circled numbers indicate location of soil samples discussed in Miller paper. (Drafted by James B. Benedict and Bryon Olson.)

Unit 4D. Discontinuous very dark brown (10YR2/2) to very dark grayish brown (10YR3/2) gravelly sandy loam. Weakly blocky structure. Not as compact as horizon above.

OTHER UNITS SHOWN ON PROFILE

Horizontal cross-hatching. Krotovina, filled with loose dark grayish brown to dark brown soil, seed husks, manure, etc.

Small X's. Charcoal concentration.

Diagonal cross-hatching. Oxidized zone. Colors range from yellowish red (5YR4/6) to dark brown (7.5YR4/2-3/2).

Solid black. Stones and sandstone bedrock.

COMMENTS

The sediments consist of colluvial and slopewash material derived from small fans that have developed beneath gaps in the conglomerate on both sides of the shelter. Roof fall material occurs throughout the sequence, without appreciable variation in quantity from unit to unit along the profile line. There is a marked increase in the percentage of sandstone fragments and a decrease in the percentage of conglomerate fragments toward the back wall of the shelter.

A major break in deposition seems to separate Units 3 and 4, which are possibly related to the Woodland and Archaic occupations, respectively, at the site. Perhaps these two units could be correlated with deposition of the post-Piney Creek and Piney Creek formations in the Denver area (see Hunt 1954; Scott 1963).

Much of the irregularity of horizon boundaries results from extreme rodent disturbances at the site. Rodent burrows filled with cow manure penetrate to the base of the deposit, making mixing of cultural material likely.

PHYSICAL PROPERTIES OF THE NORTHWEST WALL OF GRID SQUARES 2S/2E AND 2S/4E

by

C. DAN MILLER

INTRODUCTION

This report is a short discussion of the physical properties of the northwest wall of grid squares 2S/2E and 2S/4E at the Wilbur Thomas Shelter. Color, pH, amount of carbonate, and particle size were determined for eighteen soil samples collected from the stratigraphic section shown in Figure 3. Textural changes and pH variations are discussed and interpreted.

PROCEDURE

Color was determined for each soil sample with a standard Munsell color chart. Values are recorded in Table 1.

The pH of each sample was measured in water with a Beckman model G

pH meter. Twenty grams of soil was combined with 20 grams of distilled water in a paper cup. The mixture was stirred and allowed to settle before the measurement was taken. The Truog soil reaction colorimetric method was also used to determine pH values of the samples. Values obtained by both methods agree well and are listed in Table 1.

In order to determine if high alkaline pH values were due to the presence of calcium carbonate ($CaCO_3$), each sample was tested with dilute hydrochloric acid. If calcium carbonate were present it would combine with hydrochloric acid giving off carbon dioxide, resulting in "fizzing" on the surface of the sample. Results of this test were negative for all samples (Table 1), indicating the absence of $CaCO_3$. High pH values must be explained in some other way.

TABLE 1. Physical Properties of 18 Soil Samples from the Northwest Wall of Grid Squares 2S/2E and 2S/4E

Soil No.	Amount Carbonate[a]	pH: Measured with Beckman (G)	pH: Truog Soil Reaction	Soil Color (Munsell)
1	N	8.88	8.25	10YR4/3
2	N	7.11	7.00	10YR4/4
3	N	4.32	4.50	10YR4/4
4	N	5.78	6.00	10YR4/4
5	N	6.87	7.00	10YR4/3
6	N	3.78	4.00	10YR2/3
7	N	3.75	4.00	10YR2/3
8	N	4.06	4.00	10YR2/3
9	N	3.50	3.75	10YR3/3-4/3
10	N	3.77	4.00	10YR3/3-4/3
11	N	4.22	4.00	10YR2/2
12	N	5.91	6.00	10YR6/3
13	N	6.00	6.00	10YR5/3
14	N	5.81	5.75	10YR5/3
15	N	6.08	6.25	10YR3/2
16	N	5.75	5.75	10YR3/3
17	N	4.85	4.75	10YR3/3
18	N	7.00	7.00	10YR4/3

[a]Degree of effervescence: N = none.

Particle size (percentage of sand, silt, and clay) was determined for the samples using the hydrometer method. This method is based on the varying settling velocities of different size fractions. The amount of material in suspension at any one time affects the density of the fluid. As sediment slowly settles out the changes in density of the fluid are measured with a hydrometer. Percentages of sand, silt, and clay are presented in Table 2. Textural names used by Benedict in his discussion of stratigraphy were determined from a standard geologic triangular diagram of sand, silt, and clay.

DISCUSSION

The major source of sand, silt, and clay comprising the samples was derived from disintegration of the sandstone facies of the Oligocene White River

Formation which crops out at the lower back wall of the rock shelter. Sample compositions are locally modified by disintegrated rock-fall material, dilution or disturbance by rodent holes, and the nearby presence of disintegrating or disintegrated sandstone boulders derived from the back wall. Variations in the clay percentage may be due in part to translocation of clay within the profile caused by leaching, especially near the "outside" of the cross section which would receive more moisture than the area toward the back.

Observed pH variations within the cross section are very difficult to explain. Values range from 8.88 to 3.50, a variation which is impossible in soil profiles formed by geological processes. Analysis of Table 1 and the location of the soil samples shown in Figure 3 reveals two major trends: a tendency for pH to go from basic to acidic from east to west at depth, and from basic to acidic from the surface to the bottom. These trends, along with the extreme pH variation, need to be explained.

TABLE 2. Textural Analysis of the 18 Soil Samples

Soil No.	Particle Size	Distribution (%)	Soil No.	Particle Size	Distribution (%)
1	2μ = 25.0	Clay = 25.0	10	2μ = 18.3	Clay = 18.3
	50μ = 44.2	Silt = 19.2		50μ = 38.3	Silt = 20.0
		Sand = 55.8			Sand = 61.7
2	2μ = 15.0	Clay = 15.0	11	2μ = 16.2	Clay = 16.2
	50μ = 34.0	Silt = 19.0		50μ = 25.8	Silt = 9.6
		Sand = 66.0			Sand = 74.2
3	2μ = 5.0	Clay = 5.0	12	2μ = 14.0	Clay = 14.0
	50μ = 13.4	Silt = 8.4		50μ = 19.8	Silt = 5.8
		Sand = 86.6			Sand = 80.2
4	2μ = 7.0	Clay = 7.0	13	2μ = 22.0	Clay = 22.0
	50μ = 19.7	Silt = 12.7		50μ = 49.0	Silt = 27.0
		Sand = 80.3			Sand = 51.0
5	2μ = 16.6	Clay = 16.6	14	2μ = 18.0	Clay = 18.0
	50μ = 29.7	Silt = 13.1		50μ = 34.0	Silt = 16.0
		Sand = 70.3			Sand = 66.0
6	2μ = 8.0	Clay = 8.0	15	2μ = 12.8	Clay = 12.8
	50μ = 18.4	Silt = 10.4		50μ = 23.6	Silt = 10.8
		Sand = 81.6			Sand = 76.4
7	2μ = 9.0	Clay = 9.0	16	2μ = 13.6	Clay = 13.6
	50μ = 20.8	Silt = 11.8		50μ = 21.0	Silt = 7.4
		Sand = 79.2			Sand = 79.0
8	2μ = 7.5	Clay = 7.5	17	2μ = 12.4	Clay = 12.4
	50μ = 17.7	Silt = 10.2		50μ = 22.8	Silt = 10.4
		Sand = 82.3			Sand = 77.2
9	2μ = 13.0	Clay = 13.0	18	2μ = 13.0	Clay = 13.0
	50μ = 26.6	Silt = 13.6		50μ = 23.6	Silt = 10.6
		Sand = 73.4			Sand = 76.4

Processes which might produce alkaline (high pH) conditions in sediments are:

1. Ashes from burned wood commonly contain Na_2O and K_2O which react with water to form the strong bases NaOH and KOH. Samples collected

near fire pits or containing ashes would therefore have anomalously high pH values.

$$\underset{\text{orthoclase}}{2KAlSi_3O_8} + 3H_2O = \underset{\text{clay}}{H_4Al_2Si_2O_9} + 2K^+ + 30H^-$$

In this reaction silica, potassium, and hydroxyl ion are released in solution. Hydroxyl ion can raise the pH to a value of 8 or 9. Hydrolysis occurs only when water is present and would be most intense near the front of the shelter. This situation explains two extremely high pH values at the surface. Most pH values near the back of the shelter are more normal.

2. Clay mineral hydrolysis occurs when clay releases its cations in exchange for hydrogen and releases hydroxyl ion in the process.

Any or all of the above processes may be operating in the profile and help explain the lateral variation in pH.

Processes which may produce acid (low pH) conditions in sediments are:

1. The presence of human or animal excreta may alter the pH. Human feces have a pH of 4.6 to 8.4, while the pH of human urine varies from 4.8 to 8.4. Animal excreta probably falls within similar limits. It does not appear that the presence of excreta itself could significantly alter the pH, but it might affect pH after decay (see below).

2. Decomposition of animal organic matter can occur in two ways. Anerobic decomposition (without oxygen) produces ammonia, a strong base, but this situation is unlikely at the site due to the porous nature of the soil. Aerobic decomposition (with oxygen) is more likely and produces large quantities of carbon dioxide which combine with water to produce carbonic acid. Buckman and Brady (1967:360) state that organic decay and microbial activity produce sulfuric acid and nitric acid. The presence of any of the three acids would significantly lower the pH. Discovery of bones, teeth, and other animal material from the trench west of the cross section suggests the presence at one time of animal organic matter. The release and migration of organic acids to the east could help explain the vertical and horizontal pH gradient observed.

3. Decayed bones may release phosphorous which can combine with water to form phosphoric acid. One tenth normal phosphoric acid has a pH of 1.5, which is another source of low pH.

Any or all of the above processes may be operating to produce acid pH values in the cross section soil samples.

CONCLUSIONS

Textural relationships observed are relatively easy to interpret, while pH variation is anomalous and difficult to explain. Study of future pH relationships would be aided by detailed grid sampling coupled with pH measurements, elemental analysis for the amounts and types of soluble ions present, and macroscopic examination for organic matter, bone, ashes, or other foreign material.

FEATURES RECORDED

by

DAVID A. BRETERNITZ

Table 3 summarizes the characteristics, dimensions, and location of 28 features recorded during the 1969 excavations.

Feature 4 in grid square 2S/4E is a series of nine hearths and pits (Fig. 5), whose primary importance is the sequential information which they provide, even though the time interval involved is obviously relatively short. Hearth A is earlier than B and C; B is earlier than C; Feature 3 is earlier than F; and E and F are earlier than I.

Features B and C are basin-shaped hearths with heavily charcoal-flecked black fill. The edge of Hearth B is heavily burnt, hard, and red in color. Hearths D, E, G, and H are also basin-shaped and filled with black charcoal-flecked earth. E is not a pit but rather a 4-cm. thick ash layer, probably associated with Hearth F.

Burned rocks occur in Pits C and I, and a milling stone comes from Pit C. Hearth A contained 6 small stone flakes; B, 17 flakes and 3 utilized flakes; C, 15 flakes and 1 retouched flake; and H had 1 flake in the fill.

FIGURE 4. Feature 2 in grid square 2N/2E. North arrow is 25 cm. long.

No radiocarbon dates are available from any of the features. A supposed carbon sample for the lowest unit in 2S/4E was submitted to Isotopes, Inc., but no date was obtainable as they estimated that only about 15 percent of the material collected originally was actually carbon (J. B. Benedict, pers. comm., 19 May 1969).

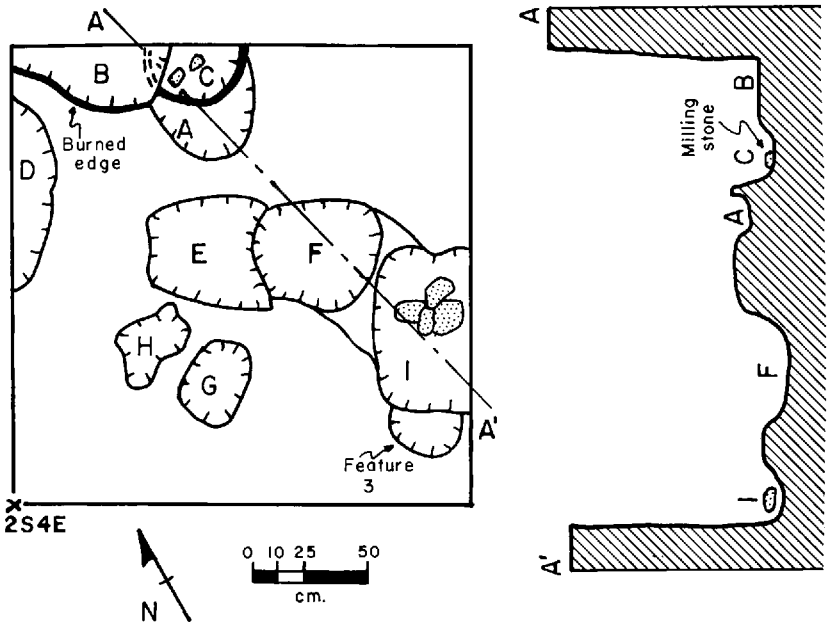


FIGURE 5. Plan and profile of grid square 2S/4E, hearth level at 80 to 82 cm.

TABLE 3. Features from University of Colorodo Excavation, Spring 1968

Grid Square	Feature No.	Description	Depth from Surface (cm.)	Dimensions (cm.)	Depth (cm.)	Associated Artifacts	C-14 Sample
2N/2E	1	Hearth area with charcoal concentration. Most removed as part of test pit extension of Grid 2 in summer 1968.	34	?	8		
	2	Rock-lined basin-shaped firepit. Vertical slabs outline pit, with flat-lying slabs in bottom. Fill of dark black, charcoal-flecked dark soil. See Fig. 4.	93	76×61	13		
	3	Unlined basin-shaped hearth with small, fire-blacked rocks at bottom which rest on a 2.5- to 3.0 cm. thick layer of black earth and charcoal flecks. Essentially same level as Feature 2.	96	50×37	10.5		
2S/2E	1	Firehearth consisting of red and black lens resting on large stone.	75	19 diam.	7		
	2	Rock-filled hearth with soft, black fill.	85	43 diam.	15		
	3	Pile of burned stones associated with charcoal and burned earth. No apparent hearth shapes.	97	49×48	13		
	4	Circular rock-lined hearth; racks fire-blackened. Bottom on bedrock, at 133 cm.	108	60 diam.	25		X
	5	Rimmed and slab-lined hearth resting on sterile.	115	75 diam.	18		
	6	Firebasin filled with burned rocks and little charcoal. Extends into sterile.	130	65×55	14		
	7	Pile of stones on sterile which overlies thin lens of charcoal and ash.	133	32×23	25		
2S/4E	1	Unlined, irregularly ovoid hearth. Filled with fire-blackened earth and fine gravel.	20	63×47	15		
	2	Circular fire hearth filled with small fire-burned stones, black earth, and white ash.	71	32×25	7	1 small corner-notched and 1 Duncan proj. pt.	

TABLE 3. Continued.

	3	Ill-defined basin-shaped, charcoal-flecked fine sand fill. Possible hearth.	79	38×17	9	Corner-notched proj. pt.	X
	4	Hearth and pit level at 80- to 82-cm. depth. Total of 9 pits. See Fig. 5 and text.	See Fig. 5				
	5	Unlined basin-shaped hearth with burned, reddish edge. Charcoal-flecked black sandy fill.	105	29×19	5		
	6	Circular unlined hearth with charcoal concentration.	107	39 diam.	11	Chips	
	7	Unlined basin-shaped hearth with black charcoal-flecked fill and some burnt rock.	115	46×23	8		X
	8	Unlined basin-shaped hearth filled with black charcoal-flecked earth and some rocks.	102	49×36	4		X
	9	Unlined basin-shaped hearth; brown-black, charcoal-flecked earth fill with some burnt rock on bottom.	115	40×19	22		
10S/6E	1	Unlined rock-filled firepit.	33	31 diam.	14		

TOOL ANALYSIS

by

ROGER LUEBBERS

INTRODUCTION

The purpose of this report is really twofold: to determine a method of operation for each tool on the basis of wear patterns or marks, and to correlate tool use with regional cultural sequences. Grady (report to follow) discusses regional ties primarily using projectile points, noting the unique character of the Wilbur Thomas Shelter. Associations or parallels to Mummy Cave, Signal Butte, Magic Mountain, Hell Gap, Pine Spring, and the McKean Site provide the settings for the comparative study of tools found at Wilbur Thomas Shelter. The arguments appearing here follow and for the most part support the framework set up by Grady. Projectile points included for illustration were not examined for wear, however, but rather were selected for discussion to expand and more completely describe additional components within each complex. The following presentation is offered merely as a preliminary classification of materials into cultural complexes as they exist in the literature, hopefully with appropriate modifications to follow a more extensive excavation in the future.

The techniques used to establish a use or method of operation typical of any given tool were developed by Semenov (1964). A 20× to 50× binocular scope proved adequate as wear marks were either obvious or nonexistent. Rubbing or polishing was adopted as a basic criterion of wear on a siliceous stone, this varying in degree of shine, shape, and size. In addition, particular concern directed toward chipping and abrasion aided in detecting resharpening, hafting, and use marks. Unfortunately, the lack of a high power microscope hampered determination of very minute yet conclusive evidence of short-term usage, a very important aspect of many early man activities. [Editor's Note: In E. P. Hammer's analysis, it was determined that only 2.7% of the recovered lithic material are tools, the other 97.3% lithics being chipping detritus and discarded cores.]

CODY COMPLEX

ARTIFACT DESCRIPTIONS

Projectile Point

Figure 6a. Stem: parallel-sided, square shoulders; fragmentary. Base: straight. Edge flaking: unknown. Cross section: biconvex.

Knife

Figure 6b. Primary flaking: unifacial, converging; cortex intact. Secondary edge flaking: unifacial, fine, confined to single edge. Cross section: plano-convex. Wear patterns: pronounced lateral polish along entire working edge.

DISCUSSION

Only two stone artifacts representing big game hunting traditions were uncovered, their location being immediately above bedrock. Enough diagnostic features remain for the projectile point to be assigned to the Scottsbluff II variety. Unfortunately, even with the presence of a very finely made unifacial knife, which in itself is highly suggestive of the Paleo-Indian, two specimens are insufficient evidence to conclude that big game hunting did in fact take place during the occupation of the Wilbur Thomas Shelter's earliest level. Indeed, the presence of the Scottsbluff point may be the result of

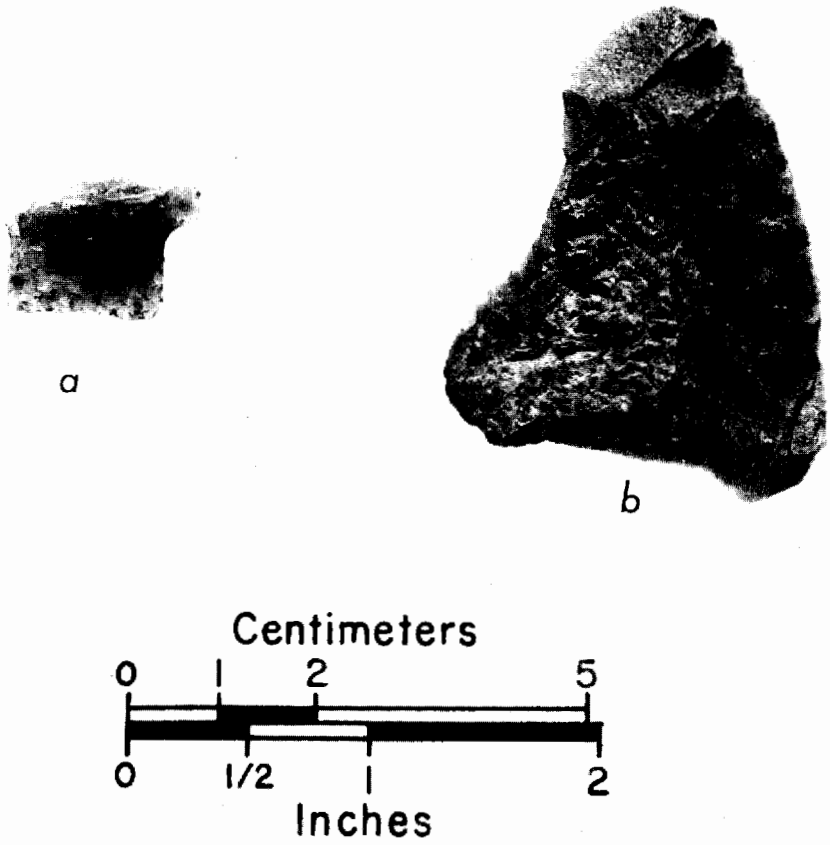


FIGURE 6. Cody Complex artifacts. a, Scottsbluff II projectile point; b, knife.

some fortuitous circumstances occurring at a later date.

MOUNTAIN COMPLEX

Artifact Descriptions

Projectile Points

Figure 7a-d. Stem: expanding-constricting, rounded, shallow lateral notches. Base: convex. Edge flaking: converging parallel. Cross section: bi-convex.

Figure 7e. Stem: parallel sides. Base: fractured, no retouch. Edge flaking: converging, parallel. Cross section: bi-convex. Tip: blunt.

Scrapers

Figure 7g-h. Primary flaking: unifacial. Secondary edge flaking: unifacial; very fine at high angle, predominately right or left edge. Cross section: plano-convex. Wear patterns: very slight abrasion along entire working edge.

Knives

Figure 7i. Primary flaking: unifacial; rough, converging. Secondary edge flaking: very fine, unifacial; restricted to entire single edge. Cross section: roughly plano-convex. Wear patterns: generalized polish on high points along entire worked edge. No chipping from use.

Figure 7j. Primary flaking: bifacial; converging, butt fracture. Secondary edge flaking: unifacial; pressure flaking along entire curvature. Cross section: plano-convex. Wear patterns: slight abrasion and chipping at tip only.

Figure 7k. Primary flaking: unifacial;

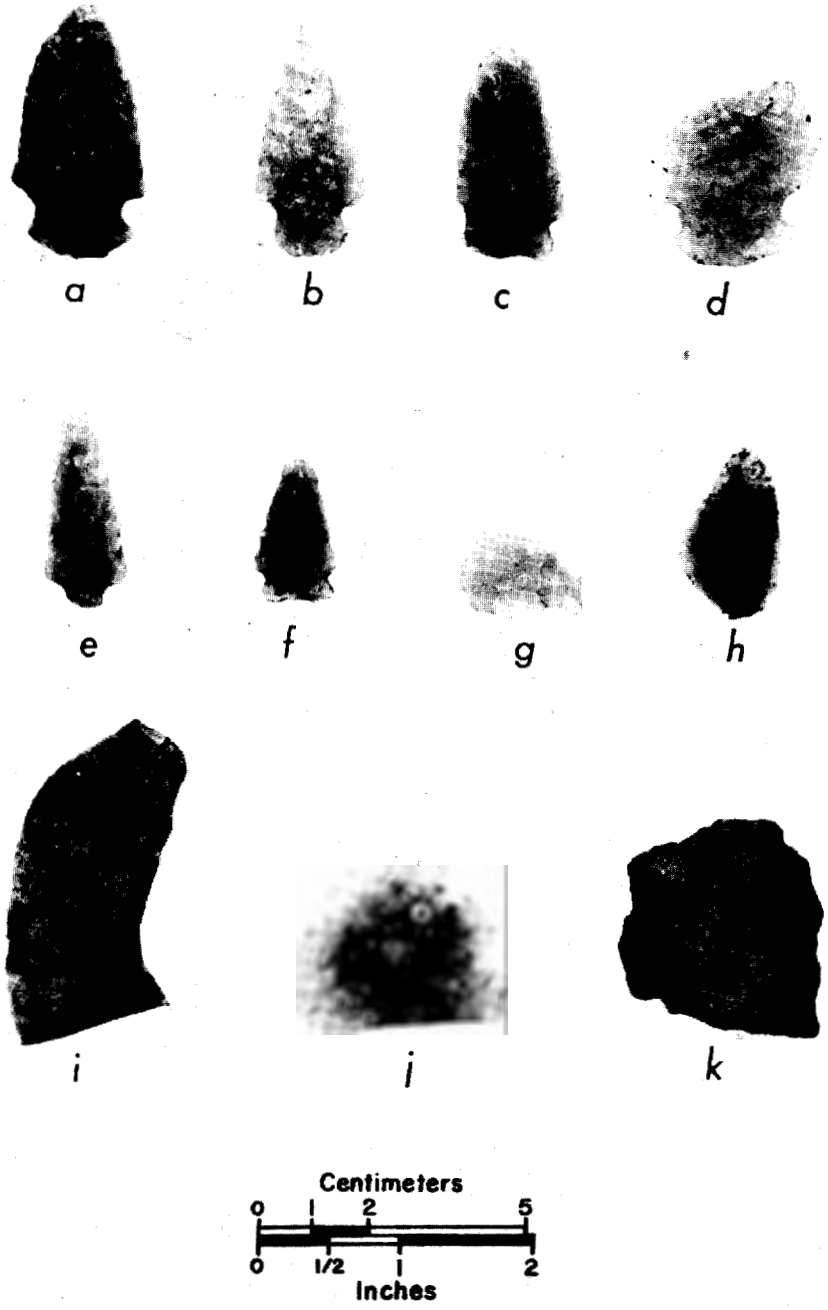


FIGURE 7. Mountain Complex artifacts. a-f, projectile points; g-h, scrapers; i-k, knives.

rough converging, asymmetric. Secondary edge flaking: none. Cross section: plano-convex. Wear patterns: none; this specimen may be a side-scraper.

DISCUSSION

Close similarities between the lower level at Magic Mountain (Irwin-Williams and Irwin 1966) and Sorenson IV (Husted 1969) on the one hand and the Wilbur Thomas Shelter on the other do indeed exist, as Grady claims. Figure 7 (a and d) corresponds very closely to Sorenson IV points (Husted 1969: Plate 9l). Figure 7b-c, however, has no counterpart and must be considered very much unlike even the closest parallels in the Apex Complex at Magic Mountain. Yet the parallel sides and oval cross section of the base and stem do not conform to artifacts associated with this complex at the Wilbur Thomas Shelter.

Further correspondence is noteworthy. The diagnostic low, longitudinal ridge in MM45 and MM49 at Magic Mountain appears in scrapers from Wilbur Thomas (Fig. 7g-h), the latter also being very similar to a Sorenson IV end scraper (Husted 1969: Plate 10p). Wear patterns on these specimens are not sufficiently developed to allow a determination of their method of operation, however, so that any functional correlation to Magic Mountain or the Sorenson Site is not possible.

Three specimens (Fig. 7i-k) do not have counterparts in the literature reviewed for this time period. Figure 7i exhibits polish along the entire lateral edge, but no rounding occurs. A cutting motion such as might be required to dress an animal carcass would, after prolonged use, create just such a polish. Yet, since no such wear has been observed nor are equivalent forms encountered in the Mountain Complex, one possible explanation for the location of this find is that it is a holdover from the big game tradition mentioned earlier. To be sure, no other example of this knife form occurs at Wilbur Thomas Shelter.

Bifacial knives, whether asymmetric or symmetric, such as Figure 7j, do occur, however, throughout the cultural sequence at the shelter, even though parallels are not illustrated in the literature cited. Yet, as use marks and the sample size of these particular specimens are limited, a functional determination remains inconclusive.

McKEAN COMPLEX, LOWER LEVEL

ARTIFACT DESCRIPTIONS

Projectile Points

Figure 8a. Stem: contracting. Base: concave. Edge flaking: converging. Cross section: medium bi-convex.

Figure 8b-f. Stem: parallel, pronounced length. Base: concave, deep notch. Edge flaking: slight to extensive surface retouch; fine to coarse. Cross section: thin to medium bi-convex.

Scrapers

Figure 8g, n. Primary flaking: unifacial; converging; cortex intact. Secondary edge flaking: rough and slight. Cross section: plano-convex. Wear patterns: slight to moderate chipping at front tip and one of either sides; no polish or abrasion.

Figure 8k-m. Primary flaking: unifacial; converging. Secondary edge flaking: unifacial; abrupt high angle at working edge. Cross section: rectangular to plano-convex, respectively. Wear patterns: slight rounding and polish at very select portion of working edge; no chipping or abrasion.

Gravers

Figure 8h. Primary flaking: unifacial; converging. Secondary edge flaking: unifacial; extensive at tip and along one-half length of specimen. Cross section: plano-convex. Wear patterns: ventral and dorsal chipping at tip; slight abrasion; no polish.

Figure 8j. Primary flaking: bifacially irregular flake; cortex intact. Secondary edge flaking: predominately unifacial with slight retouch on reverse face of cutting edge. Single cutting edge in effect, suggests chisel. Cross section: irregular. Wear patterns: abrasive wear at high points along working edge.

Knives

Figure 8i. Primary flaking: bifacial; converging; asymmetric. Secondary edge flaking: bifacial along right edge only. Cross section: plano-convex. Wear patterns: heavy abrasion and chipping from tip backward.

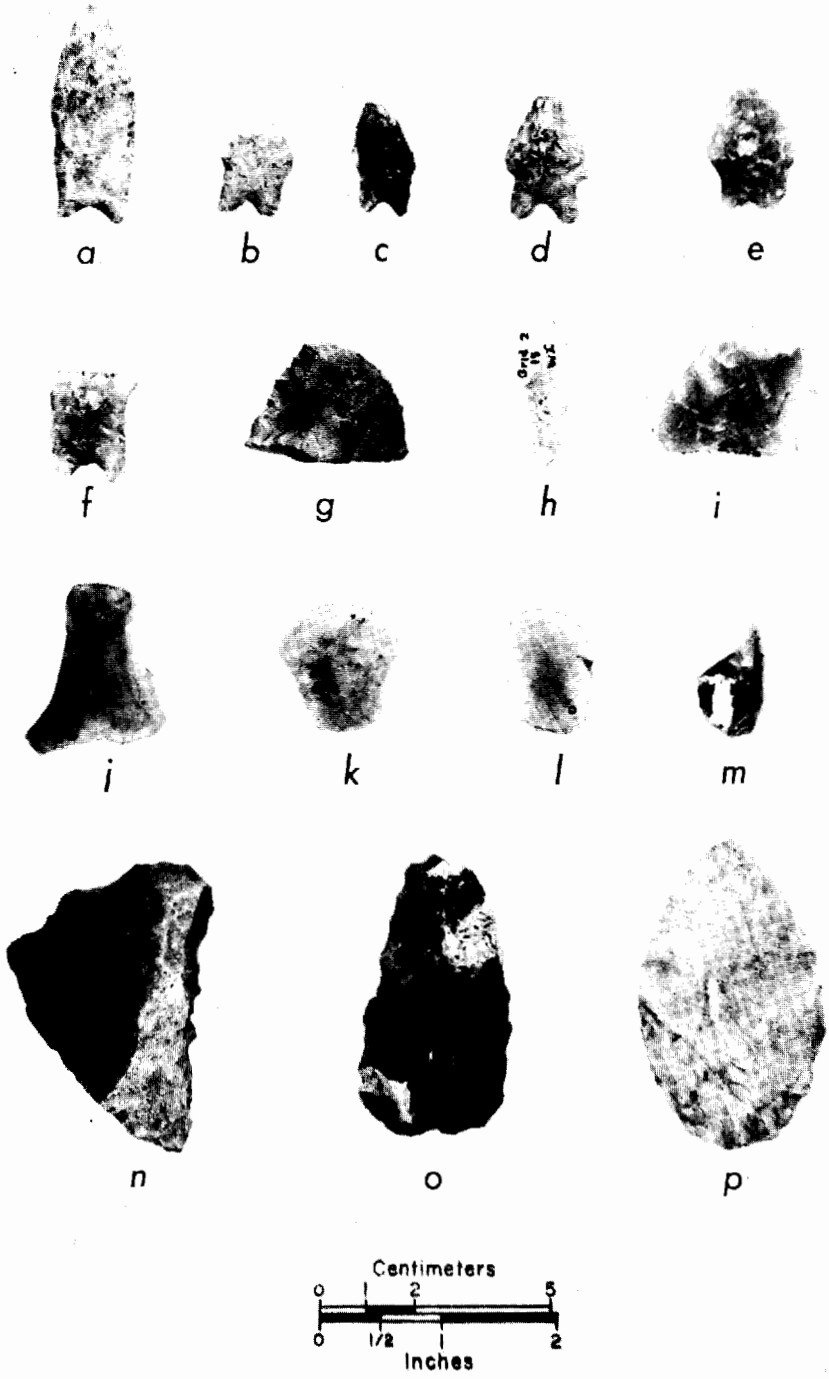


FIGURE 8. Lower level McKean Complex artifacts. a-f, projectile points; g, k-n, scrapers; h, j, gravers; i, p, knives; o, chopper.

Figure 8p. Primary flaking: bifacial; converging. Secondary edge flaking: slight retouch along entire outline. Cross section: plano-convex; thin. Wear patterns: none.

Chopper

Figure 8o. Primary flaking: bifacial; converging. Secondary edge flaking: none. Cross section: thick bi-convex. Wear patterns: limited chipping, abrasion and polish to right edge near proximal end. Battering and scraping motion inferred.

DISCUSSION

The McKean site is divided into upper and lower levels; a radiocarbon date of 3287 ± 600 years B.P. comes from the late level (Mulloy 1954:432). The collection of projectile points from Wilbur Thomas Shelter corresponds very closely to Mulloy's typological categories, which are markedly absent for this time period at Magic Mountain despite contemporaneity of the three occupations.

The comparison between the Wilbur Thomas Shelter and the McKean Site is as follows for the lower levels: The long lanceolate blades with slight constricting concave bases (Fig. 8a) are identical as are also the typical highly stylized parallel-sided stems with deeply notched bases (Mulloy 1966:444-453). Plano-convex, snub-nosed end scrapers (Fig. 8k-m) and the ovoid to triangular knives or scrapers are also present in both sites, as are spokeshaves, which are not illustrated here. Accompanying both tool inventories is a rather large and important range of small, irregular shaped tools which received little if any retouch in preparation for use. These tools invariably are unifacial flakes exhibiting very slight use patterns on select portions of the working edges.

McKEAN COMPLEX, UPPER LEVEL

ARTIFACT DESCRIPTIONS

Projectile Points

Figure 9a. Stem: contracting; pronounced corner notching. Base: straight; grinding very apparent. Edge flaking: very fine secondary retouch along edge only. Cross section: thin bi-convex.

Figure 9b. Stem: slightly expanding with deep, narrow corner notch. Base: straight. Edge flaking: general pressure flaking over entire surface. Cross section: thin plano-convex.

Figure 9c. Stem: greatly expanding to form pronounced lateral notch. Base: notched. Edge flaking: diagonal converging; fine retouch at edge only. Cross section: medium plano-convex.

Figure 9d-f. Stem: none; unnotched. Base: convex. Edge flaking: fine retouch along entire outline. Cross section: plano- to bi-convex.

Graver/Scrapers

Figure 9g, l. Primary flaking: unifacial; parallel to irregular. Secondary edge flaking: restricted to select working edge only; Figure 9g is multi-purpose tool. Wear patterns: slight chipping and edge polish, results in dulling. Cross section: irregular.

Figure 9k. Primary flaking: unifacial; initial flake removal only. Secondary edge flaking: unifacial on dorsal side only; high angle along entire outline. Cross section: triangular. Wear patterns: general abrasion to blunt cutting edge and to sections of sides anterior to tip.

Perforators

Figure 9h-j. Primary flaking: unifacial; irregular. Secondary edge flaking: along tip only. Cross section: irregular. Wear patterns: slight chipping at tip and immediately posterior; shoulders of Figure 9h heavily chipped; lateral chipping of Figure 9j suggests use as awl or reciprocating drill.

Knives

Figure 10a-c. Primary flaking: bifacial and unifacial; bulb of percussion intact. Secondary edge flaking: slight pressure flaking confined to edge only; greater at right or left edge at tip. Cross section: plano- to bi-convex. Wear patterns: slight chipping either right or left edge immediately posterior to tip. No polish.

Figure 10d-e. Primary flaking: bifacial; converging. Secondary edge flaking: bifacial retouch limited to curvature resulting in slight serration. Cross section: roughly bi-convex. Wear patterns: none apparent.

Scrapers

Figure 10f-i. Primary flaking: unifacial;

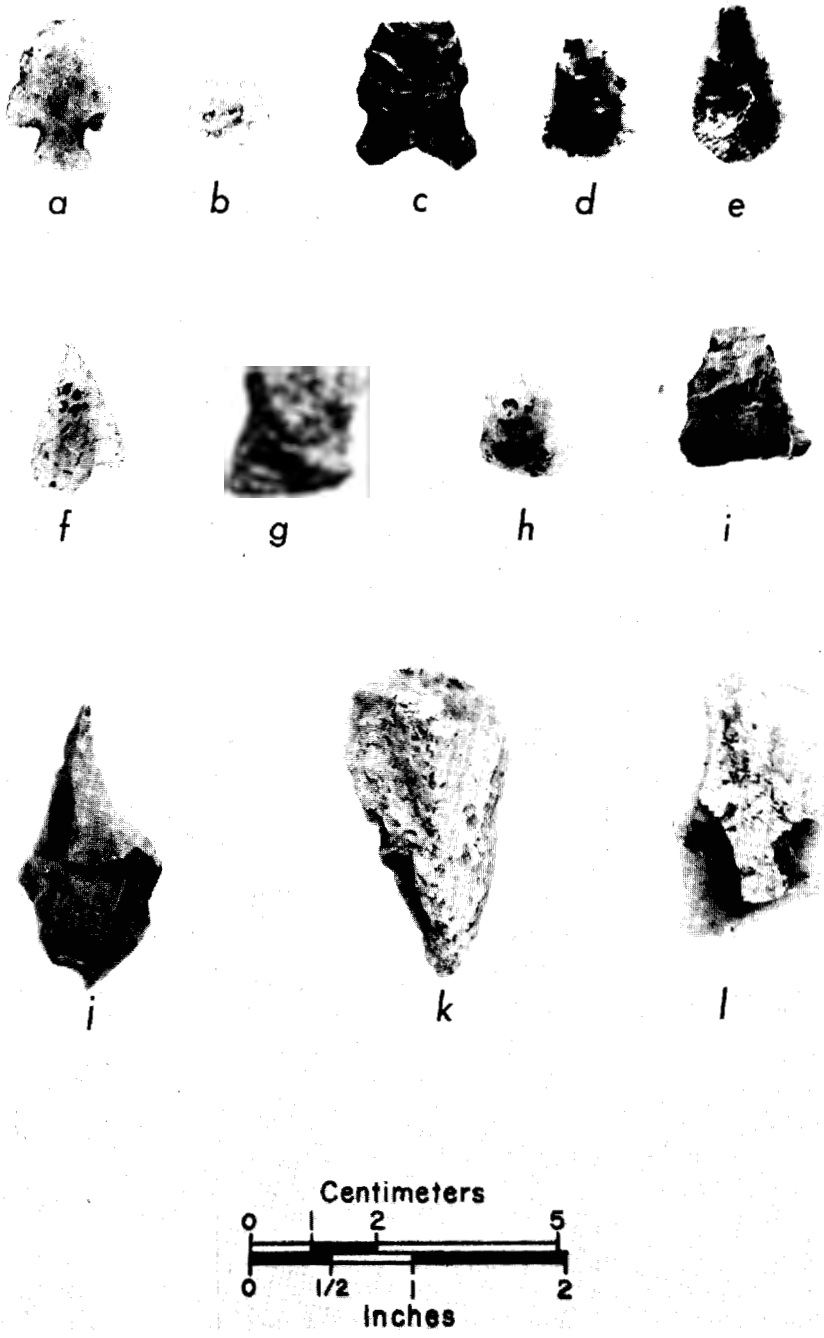


FIGURE 9. Upper level McKean Complex artifacts. a-f, projectile points; g, k-l, graver/scrapers; h-j, perforators.

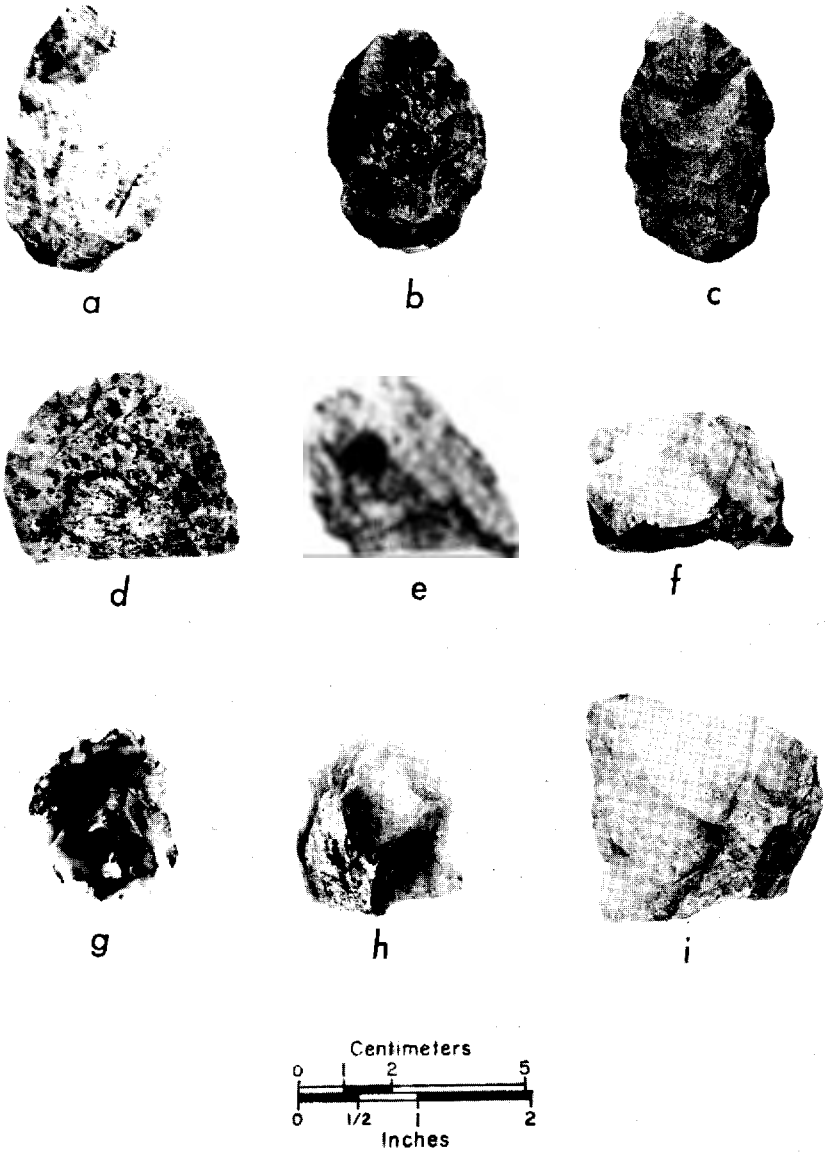


FIGURE 10. Upper level McKean Complex artifacts. a-e, knives; f-i, scrapers.

irregular, converging; cortex intact. Secondary edge flaking: unifacial; confined to select segment of working edge. Cross section: irregular plano-convex. Wear patterns: abrasion, polish and use-chipping occurs on dorsal face. Some evidence of resharpening.

DISCUSSION

Comparisons between the stone complex of upper level McKean and the Wilbur Thomas Shelter are as follows: the projectile point types again correspond very closely, although a large range of characteristics is not available because many are

badly broken. Most typical, however, is the triangular unnotched point (Fig. 9d-f). Of special significance, Figure 9c holds membership in the McKean complex as a variant of the Hanna Point (Wedel 1964:283). Plano-convex, snub-nosed end scrapers with retouched or plain backs, ovoid to triangular bilaterally flaked knives, and a "complex of retouched flakes" compare very closely to those of the McKean type site (Mulloy 1966:455). Figure 9g, l and Figure 10i illustrate very well the complex of retouched flakes and their general simplicity. Nonetheless, while these often tend to be very irregular both in configuration and thickness, the retouch and wear patterns on these tools indicate a very specialized manufacture and application. To this extent further expansion of the craftsman's tool kit concept is evident, for a wide variety of specialized scrapers, gravers, perforators, drills, and awls increase in number from lower to upper McKean, and in fact continue to increase well into Woodland times.

Manos are also found in association with McKean tool types, but metates are absent. Figure 13d possesses multifaceted faces indicating a reciprocating or back-and-forth grinding motion. Slight pitting at one or both ends was also observed.

Some difficulty in assessing the McKean typology at the Wilbur Thomas Shelter results from the fact that Woodland-type projectile points were found in lower McKean levels, below upper McKean types which were also intermixed, although to a lesser degree. Intermixing can only be explained at this time in terms of a later intrusion, a probability on the basis of the cultural-geologic stratigraphy. Selective use of the protected area within the shelter can be attested by the vertical and horizontal distribution of hearths and their absence beyond the overhang, plus the fact that stratigraphic disturbance is also very pronounced inside the shelter. Thus, the mano cited above and a number of fragmentary projectile points, although occurring suspiciously out of context, represent cultures active later than the levels from which they were excavated.

WOODLAND COMPLEX

Artifact Descriptions

Projectile Points

Figure 11a-h. Stem: slight to moderate expanding stem with deep corner or basal notch. Base: convex to straight. Edge flaking: pronounced along converging sides with moderate to no serration; no grinding. Cross section: thin plano- or bi-convex.

Figure 11i. Stem: greatly expanding, parallel side notches. Base: concave. Cross section: moderate plano-convex.

Figure 11j. Shape: triangular, unnotched. Base: straight. Cross section: plano-convex.

Snub-Nose End Scrapers

Figure 11k-o, r, u-v. Primary flaking: unifacial; converging. Secondary edge flaking: unifacial; high, abrupt angles. Cross section: rectangular (Fig. 11k) to plano-convex. Wear patterns: pronounced rounding, polish, and chipping to front cutting edge; dorsal face. Wear on thin specimens (Fig. 11l-m) confined to select section of working edge.

Gravers

Figure 11s, x. Primary flaking: unifacial, converging. Secondary edge flaking: slight to moderate retouch of working edge only. Cross section: irregular. Wear patterns: slight rounding of edge; no chipping or polish.

Perforator

Figure 11p. Primary flaking: unifacial; converging. Secondary edge flaking: sufficient to affect point. Cross section: plano-convex. Wear patterns: heavy chipping along shoulders; slight polish.

Drill(?)

Figure 11t. Misplaced in laboratory after photography.

Specialized Scrapers

Figure 11q, w; 12a, c-d, h. Primary flaking: predominantly unifacial with slight bifacial flake removal. Secondary edge flaking: unifacial only; confined to select cutting edge areas. Cross section: irregular to plano-convex. Wear patterns: very slight to heavy polish, abrasion and

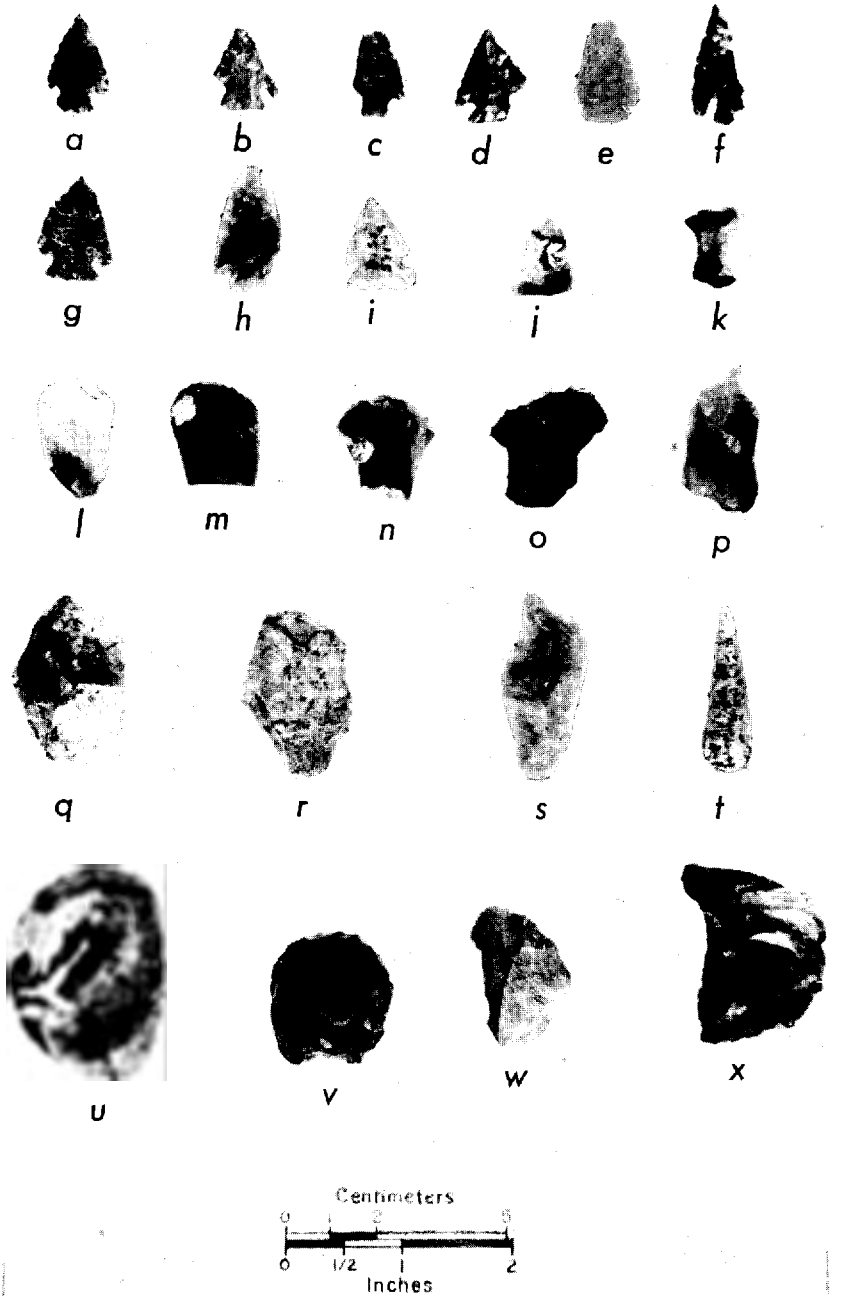


FIGURE 11. Woodland Complex artifacts. a-j, projectile points; k-o, r, u-v, snub-nosed end scrapers; p, perforator; q, w, specialized scrapers; s, x, gravers; t, drill(?).

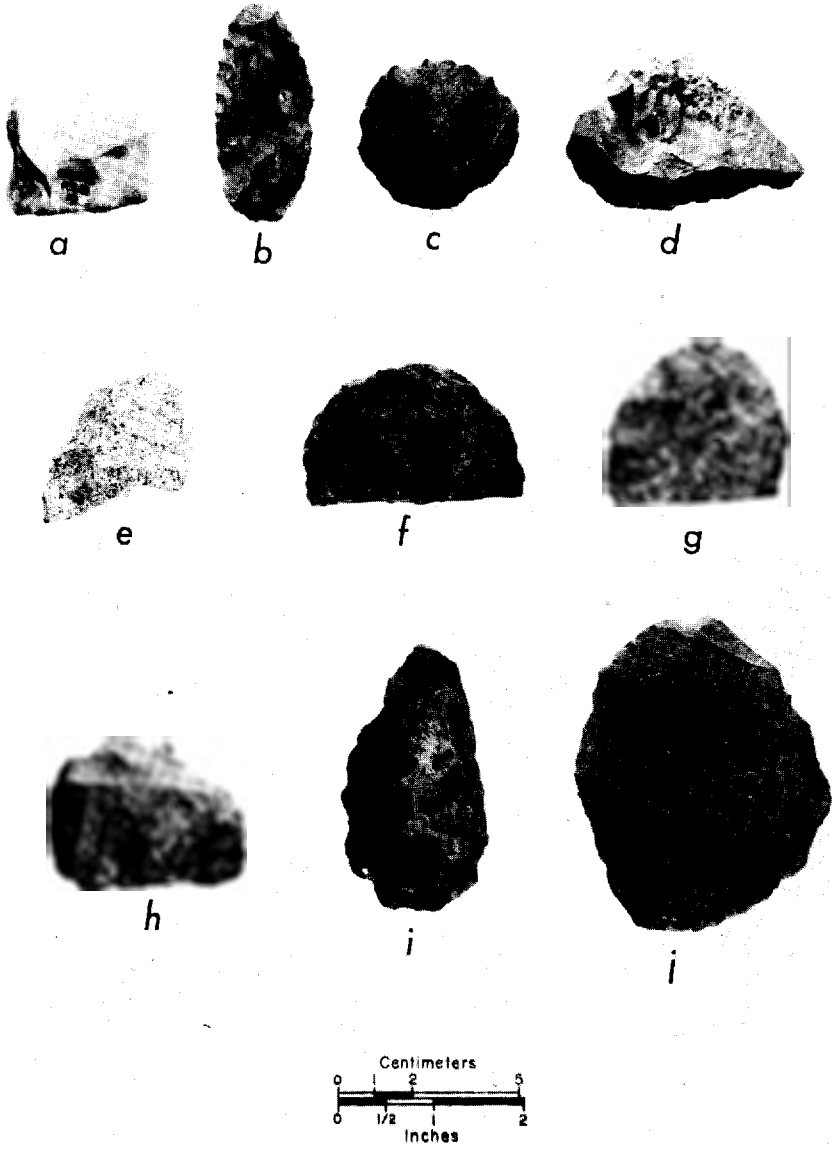


FIGURE 12. Woodland Complex artifacts. a, c-d, h, specialized scrapers; b, e-g, knives; i-j, cores.

chipping to working edge. Figure 12d exhibits pronounced polish effected by the user's hand.

Knives

Figure 12b. Primary flaking: bifacial. Secondary edge flaking: complete over entire surface; reworking of left edge. Cross section: bi-convex. Wear patterns: slight polish to left edge at tip suggests reworking was an attempt to resharpen.

Figure 12e. Primary flaking: bifacial; asymmetric. Secondary edge flaking: slight and rough. Cross section: roughly bi-convex. Wear patterns: heavy chipping and abrasion on obverse side; no polish or rounding of edge.

Figure 12f-g. Primary flaking: bifacial; converging. Secondary edge flaking: fine to moderate retouch. Cross section: plano-convex. Wear patterns: pronounced polish with slight chipping at select anterior points.

Chopping Cores

Figure 12i-j. Primary flaking: unifacial; roughly converging. Secondary edge flaking: bifacial and unifacial, respectively; coarse percussion flaking. Cross section: roughly plano-convex. Wear patterns: none apparent.

DISCUSSION

The resemblances between Magic Mountain Woodland-type projectile points and the Wilbur Thomas Shelter compare no more favorably perhaps than any other Woodland horizon located in the Rocky Mountain foothills. Stems are slight to moderately expanding with shallow to deep and narrow corner-notching. Bases are either convex or straight. Special note is called to Figure 11i and MM38 (Irwin-Williams and Irwin 1966:92), an uncommon variation in either site. Sharrock has unearthed this so-called "Desert Side-Notch" style at the Pine Spring occupation level 3, which has been dated from the ceramic finds at A.D. 950-1200, either a very late Woodland or a protohistoric complex (Sharrock 1966:Fig. 42a). The presence of these point types has been identified with the late Woodland entity termed the Franktown Focus (Withers 1954:2). Projectile points or blade/knives which resemble Figure 11i are not uncommon in Woodland occupations along the east front of the Rockies elsewhere in eastern Colorado (see Nelson 1969:Fig. 10).

Aside from a comparative treatment of the projectile points in the Woodland tradition, other components in the lithic inventory remain diagnostically inconclusive. In noticing an increase in tool size and an apparent revitalization of skinning and butchering as well as generalized forms from A.D. 1-500, Mulloy infers a reemphasis on hunting and gathering at the expense of an agricultural way of life. To be sure, the Wilbur Thomas Shelter does produce such a trend in tool size, while retaining a small but continuous inventory of manos possibly as early as late McKean. In light of this, the Plains agricultural tradition seems to have failed to exert demonstrable influence upon the high plains/foothill margin. This situation is also recognized and discussed by Wood (1967).

No unique form of mano (Fig. 13) can be assigned to a particular cultural level. Either the rounded, flat face mano (Fig. 13b-c, e) or the round, long variety appears from McKean levels to the surface. Furthermore, because the former type is commonly associated with hearths and is fire-blackened, its condition suggests a secondary use resulting in stratigraphic intrusion. Wear patterns as well as wear itself indicate two motions involved in operation: a reciprocating back-and-forth motion for the long ovoid type, and a circular grinding motion on the flat, rounded variety.

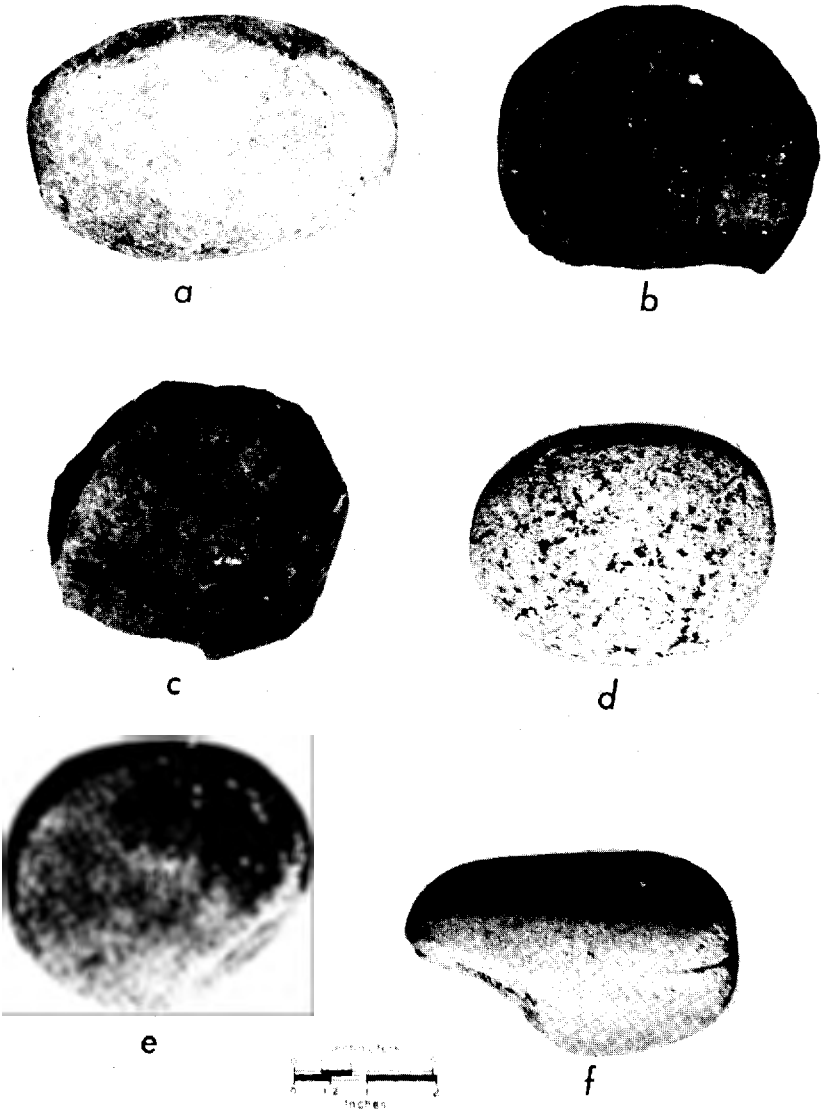


FIGURE 13. Manos. a, d, f, bifacial, ovoid to triangular in cross section; b-c, e, bifacial, flat to plano-convex in cross section; fire-blackened.

SUMMARY

If our development and understanding of the cultural sequence at Wilbur Thomas Shelter is correct, no long-term interruption in the shelter's occupation occurred. However, occupation by culturally identical or associated peoples

throughout any given expanse of time seems highly unlikely. Two types of trends present themselves along the time continuum suggesting a generalized characteristic around which peoples in the region developed, through either external or internal requirements, or both. The first is a developmental emphasis beginning just prior to the Mountain Complex of a specialized though simplified type of scraper. This trend can be traced well into the Woodland and perhaps into historic times.

Secondly, an increase in tool size is associated concomitantly with a revitalization of older styles, as mentioned earlier.

The first trend suggests an increasing involvement not only with material used in tool and weapon manufacture, but also an increase in craftsmanship. This trend does not imply that all tools were made very finely and expertly, but rather that the efficiency of certain tools used to manufacture other implements increased and that specific job and survival requirements led to an expanded inventory. Because stone sources in the area are abundantly plentiful and of very good quality, no change in the selection of materials is evident at the shelter. Nonetheless, greater exploitation and a greater commitment to the region, plus any advantageous change in the ecology, may well involve greater use of wood, other fibrous plants, and bone as tools and implements.

In particular, a long tradition of asymmetric but sometimes symmetrically worked knives/scrapers (Fig. 10d-e) beginning in the McKean exemplifies a type of continuity reflected in both the form and function of the implement. And, like the increase in specialized scrapers (Figs. 9g, i; 10i; 11w; 12a, d), the numerical increase of asymmetric knives climaxes during the Woodland. Based on their size, these tools quite conceivably could be operated by hand, but just as reasonable is the suggestion that they were hafted. No marks on the tools argue either case, however.

The fact that tools developed in size and in a style long past need not be explained as a "re-emphasis on hunting and gathering" as Mulloy claims. Instead, a seasonal occupation of the Plains or a longer semi-annual habitation of that zone affected by the foothills climate may well have been possible by an expanding technological adaptation to both the montane and the fringe Plains ecologies. Consistent with such an adaptation to two varied surroundings, dual requirements were imposed on the tool technology and on their way of life. Woodworking elements such as the specialized scrapers and gravers mentioned earlier, butchering and killing tools, and milling stones each represent answers to such requirements. In this vein, one senses a dual complicity, as Grady suggests, with a forested and high plateau type of environment and a Plains type. The emphasis then becomes a revitalization not at the expense of but rather as a result of contacts and diffusion which in turn were to expand the tool inventory and provide greater variety in a way of life closely related to a foothills environment. And yet, due to its nature as a rock shelter and because the evidence does not indicate a full-time, year-round occupation of the site, any conclusions concerning a way of life at the Wilbur Thomas Shelter must be pieced together at the regional and not the local level.

PROJECTILE POINT PROVENIENCE

by

JORN ZIMMERMANN

Figure 14 shows the main types of points which were recovered from the excavations. Descriptions of the projectile point types are then given. Table 4 depicts the relationships between the types and the depth locations. Ranges of depths indicated for individual specimens result from two situations: first, some points were recovered in screening operations while excavating general levels, and second, some points were recovered during testing in the summer of 1968 for which provenience information is lacking.

Side-notched. Number: one. Depth: 15 cm. Dimensions: 2.1 by 0.6 by 0.3 cm. Material: chalcedony.

Corner-notched A. Number: fourteen. Depth: 3 to 77 cm. Dimensions: 2.2 to 1.3 by 0.2 cm. to 2.5 by 1.7 to 0.3 cm. Materials: chalcedony, chert, moss agate.

Corner-notched B unserrated. Number: six. Depth: surface to 31 cm. Dimensions: 2.0 to 1.5 by 0.2 cm. Materials: chalcedony, chert.

Corner-notched B serrated. Number: three. Depth. 25 to 50 cm. Dimensions: 1.8 to ? by 0.2 cm. to 2.2 by ? to 0.4 cm. Materials: chert, quartzite, jasper.

Duncan-Hanna. Number: nine. Depth: 31 to 77 cm. Dimensions: 2.6 to 1.8 by 0.4 to 2.8 by 2.0 to 0.6 cm. Materials: chalcedony, chert, jasper, quartzite.

McKean. Number: one. Depth: 48 cm. Dimensions: 5.0 by 2.0 by 0.6 cm. Material: quartzite.

Large corner-notched. Number: ten. Depth: 56 cm. to bedrock. Dimensions: 2.7 to 1.5 by 0.6 to 5.0 by 2.5 to 0.7 cm. One broken point was 3.2 cm. wide. Materials: chalcedony, chert, quartzite.

Scottsbluff II?. Number: one. Depth: more than 120 cm. Dimensions: base width 1.7 cm. Material: chalcedony.

Despite some mixing there appear to be four levels. The first level, surface to 30 cm., contains primarily small corner-notched B type points, a few of the corner-notched A type, and a side-notched point. In the second level, 30 to 50 cm., corner-notched B becomes much smaller in number and serrated. The majority of the points seem to be almost equally divided between corner-notched A and Duncan-Hanna, with one McKean point. This level also has the largest number of fragments and half the total blanks or preforms (3). Level 3, 50 to 80 cm., again has almost the same number of corner-notched A points and Duncan-Hanna points. There are no corner-notched B or McKean points, but the first large corner-notched points appear. There are no points between 80 and 100 cm. The fourth level, 100 cm. to bedrock, contains only the large corner-notched points and the Scottsbluff base.

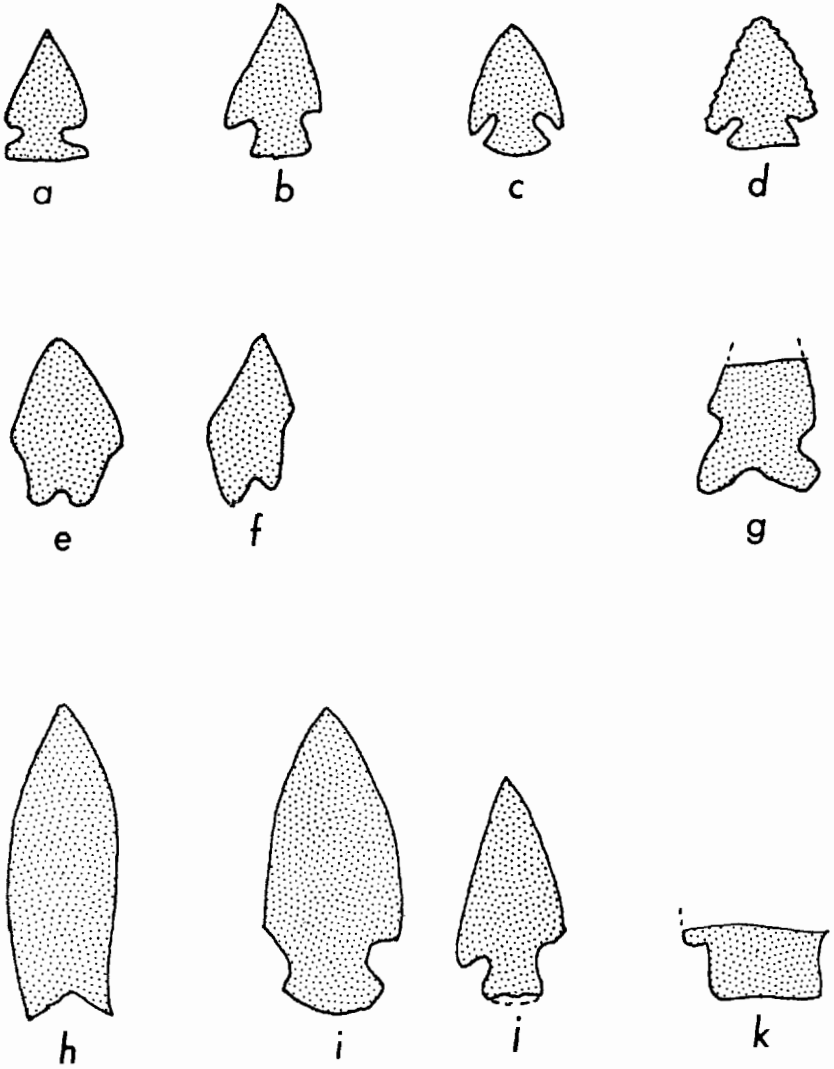
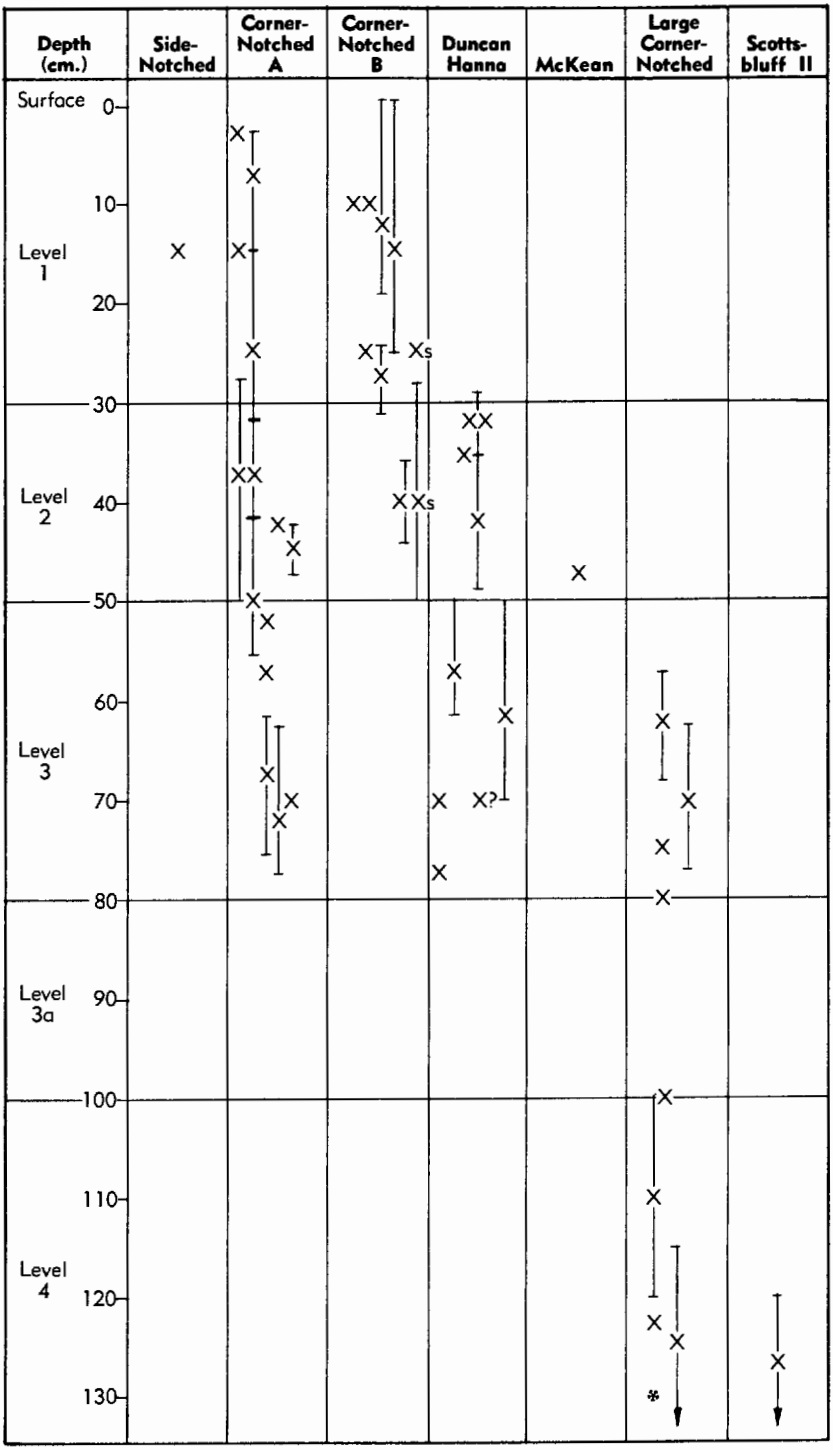


FIGURE 14. Projectile points. a, side-notched; b, corner-notched A; c, corner-notched B unserrated; d, corner-notched B serrated; e-g, Duncan-Hanna; h, McKean; i-j, large corner-notched; k, Scottsbluff II?.

TABLE 4. Projectile Points According to Depth and Type.[a]



[a]Each X indicates the location of a projectile point. Some were found within a depth range, indicated by horizontal bars; other X marks without a depth range indicate the exact depth of the projectile.

Xs = Serrated projectile.

* = Projectile found in wall.

CERAMICS

by

DAVID A. GILLIO

INTRODUCTION

Only two potsherds were recovered during excavation. Both sherds are best identified as being Plains Woodland. The following description is guided mainly by Wheeler's (1952) check list for Plains ceramic analysis.

DESCRIPTION

Paste: Texture and temper were observed using a 30 power monocular microscope equipped with an ocular scale. Aplastics are quartz sand ranging in size from coarse to very coarse on the Wentworth scale (Shepard 1956:118). Temper in the larger sherd (Fig. 15) ranges from 5 to 10 μ in the longest dimensions; the smaller sherd's temper ranges from 15 to 20 μ. Most grains are sharply angular.

The paste is not very friable. There are thin laminations parallel to the surfaces as well as a major lamination along which appears a fracture line. The major laminae are approximately equal in thickness and, particularly in the small sherd, mark the transition zone of color between interior and exterior surfaces. This same feature is reported for some Uhl site pottery (Wood 1967: 138), where it is taken as an indication that pot modeling was by a piece-building technique using patches (p. 141).

Exterior surfaces differ in color from interior surfaces in both specimens and also differ in color from the core in the one instance where a fresh break

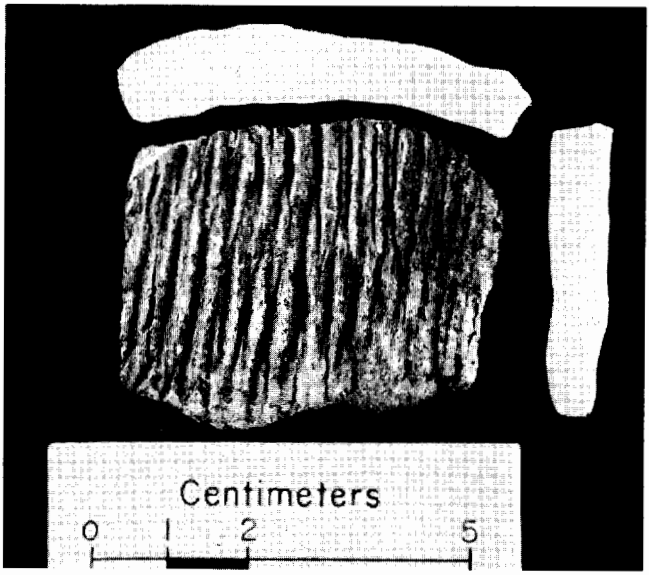


FIGURE 15. Woodland potsherd from Wilbur Thomas Shelter.

was observed (large sherd). All color readings were obtained by direct comparison with a Munsell Soil Color card in light from a north window. The exterior surface of the larger sherd was encrusted with carbon which was largely removed before the color determination was made.

	Large Sherd	Small Sherd
Exterior	2.5 YR4/0	10 YR5/1
Core	7.5 YR2/0	
Interior	10 R5/3	10 R6/3

Sherds were tested for hardness using a mineral kit. On the Moh scale, both have a hardness between 2 and 3.

Surface Treatment: Exterior surfaces are marked by a cord-wrapped paddle technique. The twist of the cord is not distinguishable but there is a suggestion that it may have been two-ply. The cord impressions exceed 1 mm. in depth and have a maximum width ranging from 2.5 mm. on the small sherd to 3.0 mm. on the larger one. Cord marks are roughly parallel and closely spaced (ca. three per centimeter). It is not possible to state the direction of the markings or the area represented by the sample since both sherds are from the body and give no orientation clues. Thickness is quite irregular but extremes of both pieces are included in the range from 5 to 8 mm.

The interior surface of the smaller sherd seems untreated other than by smoothing by an anvil. The larger sherd's interior is marked by a series of anvil depressions (Matson 1963:490) as well as scratch marks visible to the unaided eye. The texture of both surfaces is medium fine.

Provenience: The larger sherd was recovered from grid 2S/4E at a depth below datum of from 18 to 29 cm. The smaller sherd, also from 2S/4E, came from a depth below datum of between 39 and 49 cm.

CONCLUSIONS

Comparison of these sherds with similar ones from nearby Colorado sites permits one generalization. Pottery from Happy Hollow Rock Shelter (Steege 1968), the Uhl Site (Wood 1967), and Van Bibber Creek (Nelson 1969) all seem to be closely related to the Wilbur Thomas material and tend to confirm the general evaluation. Based on the sherds themselves and the associated lithic artifacts, this material can be assigned to some portion of the Woodland period.

THE WILBUR THOMAS SHELTER AND ITS RELATIONSHIP TO OTHER SITES IN THE ROCKY MOUNTAINS AND THE PLAINS

by

JAMES GRADY

INTRODUCTION

The Wilbur Thomas Shelter is one of the few sites with a fairly long stratigraphic sequence that has been found in the region. Five occupation levels have been defined at the site: Cody Complex, Mountain Complex, McKean Complex, Woodland Complex, and Historic period. Each of these will be discussed in turn, and their relationships with other sites and complexes will be compared. (EDITOR'S NOTE: Luebbers divided the McKean Complex into Lower and Upper levels in his paper.)

CODY COMPLEX

The Cody Complex at Hell Gap has a mean date of 6640 B.C. (Willey 1966:47) and the Cody material at Olsen-Chubbuck dates to around 8200 B.C. (see Breternitz 1969:115). However, only one broken base of a Scottsbluff projectile point was recovered at Wilbur Thomas and this could have been carried in at a later date. Similar material was recovered in Zone D at Magic Mountain which is thought to represent collecting activity of the post-Cody occupants (Irwin-Williams and Irwin 1966:85). It is obvious that no valid conclusions can be drawn from a sample this small, other than to note its presence.

MOUNTAIN COMPLEX

Jesse Jennings has stated: "The Desert Culture was also dominant in the Plateau area during this time. In the High Plains sites like Birdshead, Pictograph II, Laramie and Ash Hollow caves and open sites—Signal Butte McKean I and perhaps the upper levels of Angustora, and others—represent an eastward extension of the Desert Archaic during the 5000-3000 B.C. time period" (1964:153).

This view has prevailed in the thinking of workers in the Western Plains because the concept offers a tempting and plausible explanation for the apparent lack of sites during what has been described as the "Altithermal hiatus." What happened to the Paleo-Indian big game hunters? What happened to the vast herds of animals these people used as sources of food? If, as Jennings states, the climatic conditions changed enough to dessicate the plains to the extent of driving off the herd animals, then the Paleo-Indian would have had to follow the retreating herds or radically change his way of life. The appearance of grinding stones has been thought to indicate the latter idea.

Recently, Olson (1969:30) has indicated that between 5500 and 4000 B.C. ". . . it appears that the entire region—plains, foothills, and mountains—was abandoned with the onset of the Altithermal."

In any case, the appearance of the McKean Complex has been used to

identify, both in time and space, the reoccupation of the Plains and the beginning of the Plains Archaic Period (Wedel 1961:250).

Recent work at three sites seems to modify the abandonment concept. Mummy Cave spans the Altithermal hiatus and is characterized by a series of side-notched projectile points starting at Layer 16 (5680 ± 170 B.C.) and continuing through the appearance of the McKean Complex at Layer 30 (Wedel *et al.* 1968:184-185). Layers 21 through 28 have points identified as types found in the mountain regions of the area, while the side-notched types are thought to be similar to material from Simonson and Logan Creek. It is thought that these layers span the Altithermal of the Plains (Wedel *et al.* 1968:184-185).

Possibly the best defined example of the Mountain Complex is the Sorenson Site in the Big Horn Canyon of Wyoming. Sorenson IV is of greatest use to us as it closely matches the Magic Mountain Site near Denver and is well dated at 3525 ± 190 B.C. (Husted 1969:15). Husted has distinguished two branches in the period that separates the Paleo-Indian from the so-called Archaic. These branches are the Plains branch and the Mountain branch.

Husted views the Plains branch as including Agate Basin, Alberta, Cody, MacHaffie, and leading into Signal Butte. The Mountain branch includes Magnus I, which Husted sees as being derived from the Agate Basin Complex, Sorenson II-Bottleneck Cave I, and Sorenson IV (Husted 1969:Fig. 33).

Layer 28 at Mummy Cave, the lower level at Magic Mountain, and Sorenson IV are equated as being a common manifestation of the Mountain branch. Side-notched, straight base group 4 projectile points from Sorenson IV are favorably compared with types MM4, MM18, MM19, and MM20 at Magic Mountain, and "the unique side-notched, convex base specimen compares favorably in form to Magic Mountain Types MM21 and MM22" (Husted 1969:88). The point types at Wilbur Thomas Shelter follow this same basic pattern, and a close resemblance between Magic Mountain types MM3, MM4, MM22, and the Wilbur Thomas material is noted.

Point types MM1 through MM4 are assigned to the Magic Mountain Complex and MM5 through MM23 to the Apex Complex (Irwin-Williams and Irwin 1966). On this basis Sorenson IV and the Mountain Complex at Wilbur Thomas include elements of both the Magic Mountain and Apex Complexes.

Examination of the Denver Museum of Natural History collection of Magic Mountain material collected by the Huschers, described as "Apex material," produced types described by the Irwins as MM3(Hap 41a), MM4 (Hap 156), MM5(Hap 105), MM6(Hap 89), MM18(Hap 246), and MM35(Hap 13a). No effort was made by the Huschers to categorize this material other than to describe it as "Apex" (Robert Ackerly, pers. comm.). Using the Magic Mountain report as a guide it was found that Magic Mountain, Apex, and Woodland materials were represented. The total appearance of the collection bears notable similarities to the material recovered at Wilbur Thomas.

Further similarities between these sites are noted. Fire pits with a fill of burnt stones similar to those found at Magic Mountain and Sorenson IV have also been found at Wilbur Thomas.

Husted's date of 3525 B.C. for Sorenson IV and his assumption of a date of 3500 B.C. for the lower level at Magic Mountain seem reasonable since the Irwins report a date of 2950 B.C. at the base of the Apex Complex, which follows the Magic Mountain Complex (Irwin-Williams and Irwin 1966:216). On this basis, it would be reasonable to assume a similar date for the Mountain Complex at Wilbur Thomas.

The lack of sites assignable to the Altithermal period of about 5000 to 3000 B.C. and the idea of the abandoned plains may be more of a gap in research than an actual lack of archaeological material.

THE McKEAN COMPLEX AND ITS VARIATIONS

As noted earlier, Mummy Cave represents over 9,000 years of occupation and it spans the so-called Altithermal hiatus of the High Plains. It ties in well with typical Plains sites of the so-called Archaic period. Layer 30, dated at 2470 ± 150 B.C., is comprised of McKean material; this material serves as a fossil index as it is well dated, widespread, and fairly restricted in time. The appearance of McKean material has been cited by several authors as indicative of the beginning of the Plains Archaic. Mulloy (1954:433) places this material at the beginning of his Early Middle Period. Wedel (1961:250) identifies the beginning of this same period as the Archaic and views it as being initiated by the appearance of the McKean point.

Gordon Willey states: "Not until around 3000 B.C. did a number of Plains Archaic site occupations appear. . . . The principle projectile point of these complexes, the McKean point, was a lanceolate with an indented base which in its outline, although not in its indifferent chipping, resembled earlier Big-Game Hunting points of the same Wyoming region" (1966:313).

The McKean point can be used for cross-dating because it is dated both by radiocarbon associations and by comparison with other sites.

Mulloy (1954:454) points out: "The particular sequence which seems closest to the McKean material and with which comparisons are most fruitful is Signal Butte I and II. Signal Butte I, pertaining to the Early Middle Period, correlates with McKean's lower level; Signal Butte II, of the Late Middle Period, with McKean's upper level." Mulloy's own radiocarbon date of 1337 ± 600 B.C. from Hearth 50 at Locality 1 corresponds well with three dates of 1590 ± 220, 1600 ± 250, and 1556 ± 220 B.C. from the Shoshone Basin, which he feels correspond very close culturally to the upper level at McKean.

Kulp, in "The Carbon 14 Method," reports a beginning date of 1490 ± 120 B.C. and a terminal date of 1000 ± 200 B.C. for the span of occupation at Signal Butte I. This dating would create conflict with the correlations proposed by Mulloy, but later dating from Lamont yields a date of 2600 ± 220 B.C. (L385D) for Bliss's reworked Signal Butte Ia. Signal Butte Ic is dated at 2220 ± 250 B.C. (L385D) (Lamont 1959:21).

Layer 30 at Mummy Cave, as noted earlier, has been identified as the point in time where "points of the well-known McKean type and its varieties appear in some numbers" (Wedel, *et al.* 1968:184-185). This layer is dated at 2470 ± 150 B.C.

On the basis of these dates, which cover a fairly large geographic ex-

panse, it is reasonable to assume that the corresponding McKean-Duncan-Hanna complex recovered at Wilbur Thomas Shelter also dates to this period. From the dates discussed, which occur about 2500 B.C., it becomes obvious that in all probability a new element entered the Plains. Husted and Mallory equate this element with the influx of Aztec-Tanoan speakers (Husted 1969:92).

THE WOODLAND COMPLEX

The presence of pottery announces the Woodland period on the Plains. In the Woodland materials at Wilbur Thomas two sherds identified as probably belonging to Wither's Parker Focus were retrieved. The Parker Focus is considered to be "related in some way to the Valley Focus of Nebraska" (Withers 1954:2). Withers further points out that projectile points range from medium to large size and are corner-notched, as are the Woodland points at Wilbur Thomas.

The Woodland projectile point types at Magic Mountain are described as types MM33 through MM38. In general form the material from Wilbur Thomas resembles these types. Zone A at the Van Bibber Creek Site contains pottery described as being of the Parker Focus (Nelson 1969:96). From this same zone projectile point types C, E, and F bear striking resemblances to the Woodland material at Wilbur Thomas. Zone A is dated at A.D. 900 ± 250 (Nelson 1969:85-106).

In general, so-called Woodland sites in eastern Colorado have produced at least fifteen dates which fall between A.D. 145 and A.D. 980 (Breternitz 1969:118-119).

A POSSIBLE UPPER REPUBLICAN MANIFESTATION

Several triangular, side-notched, straight-based projectile points similar to forms that have been identified as Upper Republican were recovered at the Wilbur Thomas Shelter. At Agate Bluff, some six miles from Wilbur Thomas, Upper Republican material was recovered (Irwin and Irwin 1957). However, no Upper Republican pottery was recovered at Wilbur Thomas, and side-notched and corner-notched projectile points do occur together in the Franktown Focus, which is considered a transitional time period between Woodland and Upper Republican in the Denver Basin (Withers 1954:2).

THE HISTORIC PERIOD

Historic material is represented by two copper or brass rings which come from the intermixed upper levels of the site.

CONCLUSIONS

In total, the site spans some 8,500 years of intermittent occupation and at no time does occupation resemble anything of a permanent nature. No burials have been found, pottery is scarce, worked bone is virtually absent, no beads or personal ornaments have been found, and no trace of agricultural or horticultural products have been recovered.

The site appears to be a shelter that offered protection from the elements

to a variety of hunting parties in a geographic setting which lies between the mountains and the plains.

SITE UTILIZATION AND ETHNOGRAPHIC ANALOGY

by

TERGE G. BIRKEDAL

INTRODUCTION

This paper is an attempt to reconstruct the way of life followed by the prehistoric inhabitants of the Wilbur Thomas Shelter. The main tool of research used for the cultural reconstruction will be ethnographic analogy.

In recent years, ethnographic analogy has become recognized more and more by archaeologists as a valuable technique for interpreting data from their excavations. Robert Ascher, one of the major proponents of ethnographic analogy, defines the method as follows: "In its most general sense interpreting by analogy is assaying any belief about non-observed behavior by referral to observed behavior which is thought to be relevant" (1961:317). In the "new analogy" described by Ascher it is no longer necessary to assume direct historical continuity between the archaeological culture and the more recent culture for which we have ethnographic data. With the "new analogy" we need only "seek analogies in cultures which manipulate similar environments in similar ways" (Ascher 1961:319). As Chang (1967:229) aptly states it, "one easily recognizes the same stage setting when an old play is staged at another theater."

Usually for any given archaeological situation there exist more analogies than can be utilized in the interpretation of the data (Ascher 1961:319). The difficult problem is to select from this wide range of possible ethnographic analogs the one which offers the "best solution."

USING THE SHOSHONI ANALOG

The Shoshoni, especially the Great Basin Shoshoni, have been chosen as the main cultural analog for the purposes of this paper. In addition, in order to close appropriate gaps in the reconstruction, other Indian groups such as the Ute, Apache, and various Plains tribes have been used for certain kinds of information. Although the Shoshoni inhabited a drier, more hostile area than the prehistoric peoples who lived at the Wilbur Thomas Shelter, there are some basic similarities betwen the two areas and cultures. Like the Shoshoni, the material culture of the Wilbur Thomas Shelter points to a simple hunting and gathering way of life. Furthermore, they were pedestrian hunters as were most of the Shoshoni in the Great Basin. The close proximity of the Wilbur Thomas Shelter to the Rocky Mountains provides a multitude of ecosystems for human exploitation (Wood 1967:14). First, there are the semi-arid short grass high plains of eastern Colorado, then the montane, subalpine, and alpine

environments. Similarly, in the Shoshoni country, especially in western Wyoming, we find a comparable situation. In the broad mountain valleys or basins of the region we find a semi-arid environment similar to the Western Plains except it contains more sagebrush and sparser concentrations of grass. Also, like Colorado, it contains montane, subalpine, and alpine environments in close proximity to each other. In addition to resembling the plains along the Colorado Front Range it provides cyclical abundance and scarcity in animal and plant life (Shimkin: 1947:245). In both areas we find warm summers and cold winters (Husted 1969:7; Wood 1967:24). Actually, the eastern sections of the Shoshoni country, like the basins in the Bighorn Mountains, are semi-detached holes of the Plains (Mulloy 1958:12).

Wilbur Thomas Shelter. Around 3500 B.C. a people who belonged to the Mountain Tradition began to utilize the Wilbur Thomas Shelter. These people came out of the Rocky Mountains and, according to Wedel (1961:251), they followed a way of life similar to the Gosiute or Shoshoni. Like the pedestrian Shoshoni these people were essentially hunters and gatherers, or foragers.

Because of the cyclical wanderings of these people the shelter probably was occupied only intermittently. The Eastern Shoshoni were continually moving in order to exploit different areas for game and plant foods (Murphy 1955:309). The shelter was probably occupied primarily during the summer months since this was the time when the buffalo massed in huge herds after the long winter months. The buffalo quickly got fat on the new summer pasturage and it was during these summer months that the Plains Indians had their great hunts (Johnson 1965:362). In addition to the buffalo there were numerous bands of roving pronghorn antelope on the High Plains (Wood 1967: 27) and also rodents, jack-rabbits, deer, and elk. The Wind River Shoshoni used to hunt both the mule deer and the jackrabbit during the summer in the wide basins of Wyoming (Shimkin 1947:275).

The shelter most likely served as a base camp for an extended family while on the summer hunt. It seems reasonable to assume that the basic social unit of these people was no larger than the extended family, as it was with the Great Basin Shoshoni (Stewart 1965:280). "Among all peoples, it is axiomatic that very small populations are unable to produce and maintain complex organizations of any kind" (Stewart 1965:280). Furthermore, the shelter provided at a maximum no more floor space than 150 square meters. Narroll (1962:588) suggests that the minimum space needed per individual in a shelter is about 10 square meters. Therefore, there would not have been room for more than twelve to fourteen people in the shelter, a reasonable number for an extended family.

Grinding stones point to the presence of women at the site, for their job was to process vegetable foods. These implements were probably for grinding dried berries from the late fall harvest and wild turnips gathered in early summer. Hunting itself argues for the presence of women at the shelter. It was the woman among the Plains Indian groups who prepared the skins and dried the strips of meat for the jerky and pemmican (Johnson 1965:353).

The site is an ideal campsite for the summer. About one-quarter of a mile east of the shelter is a small spring-fed stream. Only a few hundred yards

to the north is a large natural basin which probably contained some water after the summer rains. In addition, the overhang provided shade during a large part of the day and also protection from the sudden summer showers. Another factor which might have influenced the selection of this site would be its use as a quarry. Numerous nodules of chert, quartzite, chalcedony, jasper, and moss agate erode out of the cliff into which the shelter is cut. Here the hunters could have fashioned new tools, weapons, and projectile points needed for the summer hunt. The large amounts of chipping debris found at the site would argue for this tool-making activity.

Within the shelter itself, most activity took place toward the back of the shelter beyond the drip line where we find the thickest deposits of refuse and also the largest concentration of hearths. Since the hearths were built close to the back wall they would reflect heat better and give greater warmth and light to those sitting between the back wall and the fire.

Toward the end of the summer the people probably left the shelter laden down with meat dried for the winter. August and September saw the ripening of the numerous berries and other plant foodstuffs in the foothills less than a day's trek away, where they found chokecherries, serviceberries, wild plums, wild grapes, wild onions, wild potatoes, and wild strawberries to supplement their diets (Ramaley 1927:249). The Eastern Shoshoni usually gathered these same natural foods in July and August (Shimkin 1947:279). Also, small groups of families were probably heading into the higher mountains at this time to gather the blueberry, raspberry, bitterroot, and the all-important yamp root (wild carrot). As with the Eastern Shoshoni, the women probably did the gathering (Murphy 1955:308). The Utes of western Colorado followed this same pattern of winter preparation (Lowe 1924:201). It is highly probable that the prehistoric people of the shelter were making pemmican. This food consisted of dried slices of meat and venison mixed with melted fat, marrow, and a dry paste of crushed chokecherries. It was highly important on the Plains and every tribe made it in historic times (Lowie 1954:27). These various foods were then stored in caches or pits in the ground for winter.

Among the Eastern Shoshoni, while the women were gathering in the high mountains, the men hunted and fished nearby (Murphy 1955:309). Trout provided a welcome addition to the diet, as did bighorn sheep, elk, deer, beaver, and bear.

Winter Camp. In the fall the various families set up winter camp in the foothills along the Rocky Mountains. Both the Eastern Shoshoni and the Bannock of Idaho set up winter camps in the protected valleys of the foothills rather than in the open wind-swept basins (Murphy 1955:307, 319; Shimkin 1947:275). This practice was also probably followed by the prehistoric hunting and gathering people in eastern Colorado. During the winter the Western Plains become extremely cold and windy. In the foothills region, however, the winter months are warmer, there are less severe temperature changes, and diminished wind movements (Wood 1967:32). Also, "chinooks" (warm winds) in the winter months help lower the snow cover and provide a welcome relief from the winter cold. Another advantage to wintering in the foothills

was the game which comes down to the lower elevations during the winter. Such animals as elk, deer, antelope, and rabbit are driven out of higher elevations by snow during the winter months and were important sources of food to the Eastern Shoshoni (Murphy 1955:332). In the foothills there is water and, more important during the cold winter months, an adequate supply of firewood. Such foothill sites as LoDaiska and Magic Mountain would have been excellent wintering camps.

Among the Eastern Shoshoni the various family groups were dispersed but these camps were the stable centers of the settlement pattern (Murphy 1955:307, 332). During the winter these Colorado people could have utilized the small caves and rock shelters of the foothills region. But they may have also used wickiups or conical brush shelters with skins tied about them as did the Sheepeater Shoshoni (Trenhom and Carley 1964:24). Wedel (1961:253) believes that the prehistoric people of the Western Plains may have used brush shelters such as were used by the Great Basin Shoshoni. (These crude structures would not appear in archaeological remains and therefore can only be inferred by analogy.)

Sustenance Cycle. In the late spring the people would again head out to the Plains to hunt buffalo and antelope, and the cycle of sustenance would be repeated. This reconstruction is possibly too simplistic, as climatic fluctuations or droughts could vary the wandering pattern during some years. Also they may have made short hunting trips into the mountains and plains at other times than those mentioned. Shimkin (1947:266) found that the Wind River Shoshoni fished and also hunted elk in the summer. But the basic pattern of movement from plains to foothills to mountains and back to the foothills seems reasonable, considering the seasonal nature of hunting and gathering economies.

This hunting and gathering way of life probably characterized the prehistoric inhabitants of the Wilbur Thomas Shelter and the other peoples of the Middle Prehistoric Period living on the plains near the Colorado Rockies. Although there were changes in emphasis, the basic tool kit of these people and the other people who came into the area varied little until late Historic times. Wedel (1961:301) points out that the knives, scrapers, choppers, and awls found at historic sites on the plains do not vary significantly from those implements used over 6,000 years ago. In the Bighorn Canyon in northern Wyoming the basic hunting and gathering ways of life changed very little from the early prehistoric times up to the historic (Husted 1969:98). In some ways this persistence is also true of the Wilbur Thomas Shelter. The grinding stones, for example, are basically the same from the Middle Prehistoric Period through the Late Prehistoric Period. The hand stones are unshaped cobbles while the milling stones remain only flat sandstone slabs. Interestingly enough, they closely resemble types found in the Bighorn Canyon (Husted 1969:133).

Late Prehistoric Period. However, with the arrival of the Late Prehistoric Period there was a shift in emphasis in the Western and Northwestern Plains from gathering to a greater reliance on hunting (Wedel 1961:261). Also at this time came the introduction of the bow and arrow and cord-marked pottery. The latter trait, because it was generally rare in this area, probably caused no

basic change in the lifestyle of the people. However, the bow and arrow probably did have some effect on their culture. Rockwell (1956:41) points out that the Ute bow was deadly at 70 yards and it could be shot as rapidly as a revolver. This innovation would certainly have revolutionized their methods of hunting, in making them more efficient hunters; this probably led to the increased importance of hunting which appears in this later period. The smaller, corner-notched projectile points from the upper levels of the shelter probably reflect the shift from the use of the spear and atlatl to the bow and arrow. Also, the tool kit became more generalized with less specialized gravers and retouched flakes and more, larger knives and scrapers that were more efficient in butchering large game animals. At the Wilbur Thomas Shelter this shift in weapons and way of life took place sometime between A.D. 200 and A.D. 900. Possibly, the shelter was now being occupied for a longer period of time during the summer than before, because hunting on the plains with the new bow and arrow was more profitable.

According to Wedel (1961:103) these people may have lived very much like the Querechos, the Apache pedestrian hunters encountered on the Colorado high plains by the Coronado Expedition. These people had skin tents supported by poles and used large dogs to transport baggage and supplies on the travois. The dogs were also used to carry pack-saddles (Wedel 1961:304). Even the primitive Sheepeater Shoshoni used huge dogs which carried their skins, clothing, and provisions utilizing both the pack-saddle and the travois (Murphy 1955:309).

However, it does not appear that the Late Prehistoric peoples were totally plains-oriented. Grinding stones continue at the shelter into this period and actually increase in number, indicating the Indians were still processing plant foods, if only for making pemmican. In the foothills we still find numerous sites such as Willowbrook (Leach 1966), Van Bibber Creek (Nelson 1969), Graeber Cave (Nelson and Graeber 1966), Hall-Woodland Cave (Nelson 1967) and LoDaiska (Irwin and Irwin 1959), all associated with this period. Hall-Woodland Cave and Graeber Cave are so situated that the sun shines into them during most of the day during the winter, which would make them excellent wintering spots (Nelson and Graeber 1966:47; Nelson 1967:2). These sites could be indications that peoples were still following the old nomadic pattern and were still wintering in the foothills rather than out on the plains in such sites as the Wilbur Thomas Shelter. In addition, the mountains were still being frequented; both Woodland and Shoshonean pottery have been found in alpine areas near Nederland, South Park, and Rocky Mountain National Park (Nelson 1969:103-104).

Furthermore, there seems to be good evidence that Shoshonean people were coming into the area as early as A.D. 1000 (Wood 1967:644). Graeber Cave, dated around A.D. 1500, is definitely Shoshoni in cultural affiliation. Wood (1967:645) believes that the Intermountain Tradition or Shoshoni became dominant on the Colorado plains by the fifteenth century. About this time there were also possible Upper Republican influences appearing at the Wilbur Thomas Shelter, but these minor traits in projectile point types may only indicate contact with the peoples to the east. Besides, Athabascans were

probably in the area at this same time but it is impossible to distinguish them from the Intermountain Tradition (Wood 1967:646). Wood points out that these various peoples followed basically a similar way of life despite their different cultural backgrounds. "There seems to have been a convergence of adaptations by prehistoric inhabitants of the region regardless of their cultural background at a level of development which can only be explained by the unpredictable environment" (1967:652). Therefore it would seem highly plausible that the people living in the shelter were still basically hunters and gatherers utilizing the foothills, mountain, and plains environments but now with more emphasis on success at hunting due to the increased efficiency of the bow and arrow. In general, the nature of the Intermountain Tradition and the other cultures on the plains of Colorado argue for a way of life very similar to the pedestrian Shoshoni of the ethnographic accounts.

Hunting. The hunting techniques used by the people of the Western Plains and foothills of Colorado probably were very similar to those used by the Shoshoni groups. Shimkin (1947:268) points out that antelope are generally too swift to be caught except in surrounds or corrals. Therefore, these prehistoric people possibly organized communal hunts. The Gosiute Shoshoni built a V-shaped enclosure of brush into which they drove the antelope and then killed them at the apex (Lowie 1924:198). These same people drove deer and antelope over precipices where they shot or clubbed those still alive. On Bear River the Ute and Shoshoni usually built corrals of brush and rope into which the antelope were driven and killed with bow and arrow (Steward 1941:267). In the days before the bow and arrow the spear and the atlatl were the major weapons.

These communal hunts were also common for deer, rabbit, and buffalo. Buffalo are very wary and their keen hearing makes it very difficult to kill except in collective hunts (Shimkin 1947:266). In order to put up enough meat for the winter, bison hunting must have been necessarily collective. Before the Eastern Shoshoni had horses the people would surround a herd and close in on it. The buffalo rarely attempted to escape this human circle but merely moved around in the surround. The people could in this way kill a great number of buffalo (Lowie 1924:199). When a man went after buffalo alone he rarely got more than one animal. The Teton Sioux used a circle of fire around the herd so they could kill the animals more easily (Johnson 1965:357). They also used a V-shaped arrangement of stone piles and brush with the apex of the "V" at the edge of a cliff or ravine. When the herd was sighted a shaman in a calf-skin disguise placed himself between the herd and the mouth of the "V" and bleated like a calf to get the attention of the herd. When the herd entered the "V" they were stampeded by women and children, who stood along the brush and rock walls of the "V" waving blankets and shouting while the men drove the buffalo from behind. When the buffalo were run off the cliff those who did not die in the fall were clubbed to death; this technique yielded immense quantities of meat.

Communal rabbit hunts were common among the Great Basin Shoshoni who drove them into long, narrow nets where they were caught and clubbed to death (Lowie 1924:196). During most of the year, the prehistoric Indians

of the Colorado plains probably consisted only of small politically autonomous extended families or bands. At least this social patterning is true for the non-horse Shoshoni and particularly for the Sheepeaters (Murphy 1955:30). But the summer communal hunts necessitated cooperation among the various independent groups. The Shivits of the Great Basin used to get together like the other Shoshoni groups for communal rabbit and antelope hunts. The leadership of these hunts was based on personal merit as a clever hunter (Lowie 1924: 284). The limited powers of these leaders only lasted as long as the hunt.

After the summer ended, hunting again became more personal. Elk were hunted and tracked down by a single man (Shimkin 1947:268). Mountain sheep also were hunted individually with a few dogs which brought the animal to bay so the hunter could shoot it more easily (Steward 1941:267). This kind of hunting was common during the winter when groups were small and dispersed (Shimkin 1947:268). The Eastern Shoshoni and the Sheepeaters both used snowshoes in tracking animals during the winter (Shimkin 1947:268). Even the Arapaho and the Assiniboin tribes of the plains pursued buffalo and antelope on snowshoes (Lowie 1954:13). It would seem plausible to assume that the prehistoric people of snowy Colorado also had the snowshoe as an aid to winter hunting.

Individuals tracked antelope. They would use the disguise of an antelope skin and horns to creep up on an animal to shoot him. But it usually took many hours of tracking before the animal fell from the initial wound. Another hunting technique was a trap made by setting slanted spears on a known game trail. Blinds were used near watering places by the Ute and the Eastern Shoshoni in hunting buffalo and antelope. In addition, rodents, badgers, and other small game were hunted to supplement the diet.

Fish were not a staple on the plains but they did supplement the diet. Generally, they were caught in spring and fall. The Cree used the weir, the spear, and the scoop net. Sometimes fish were shot with arrows (Lowie 1954: 17).

Tanning. After animals were killed they were skinned and butchered. The Wilbur Thomas Shelter has produced numerous scrapers and knives which could have been used in this important activity. Although tanning methods vary among tribal groups they follow basically the procedure described by Johnson (1965:353) for the Teton Sioux. The fresh skins were staked out on the ground with the hair down. A short elk antler was used to scrape off all the tissue and fat from the inner surface of the skin. The scraper handles are either of antler or wood and about a foot long. A number of snub-nosed scrapers which could easily have been hafted to a similar handle have been found at the Wilbur Thomas Shelter. If the hide was to be used for a robe, blanket, or bedding the hair was left on the skin. When the hair was to be removed the skin was soaked and the hair scraped off with deer ribs or leg bones. The latter are generally serrated at the working end. A small fragment of a long bone has been found at the shelter which shows one end worked and possibly used at this stage of skin preparation. After the hair had been removed, the skin was submerged in water or buried for a few days in damp earth until it was ready for tanning. Tanning involved working natural oils

into the skin, usually animal brains. The skin was then allowed to dry in the sun. Next, the hide was pulled back and forth over a limb to work in the natural oils and break down the internal fibers. Sometimes a rough-edged stone was used in this process. A number of handstones found at the Wilbur Thomas Shelter exhibit roughening or pecking on the edges. It is possible that one of their uses was in the tanning process described above. Finally, the skin was put on a tripod and smoked over the fire to give it a lighter color.

Clothing. The clothing of these people was probably very simple, resembling that of the historic Great Basin Shoshoni. The men wore only a buckskin breechclout and the women a small apron (Stewart 1965:279). Nearly universal among the Shoshoni was the very warm rabbit skin blanket which was used in winter or as a sleeping blanket. The Utes also used elk skin and deer skin for blankets (Lowie 1924:216). Sandals or moccasins were worn and the Shoshoni wrapped bark and fur around them for winter use.

Cooking. Meat from the hunt was prepared in a variety of ways. It could be boiled, cooked on the coals, or broiled on a stick rack over the fire (Rockwell 1956:44). For example, the Western Shoshoni first scorched a rat in the fire and then entrails and all were boiled in a pot (Steward 1941:271). Rabbits were cooked in much the same way. Stone boiling was also common among the Shoshoni and the Plains Indians. Fire-heated stones were put in a ceramic or skin container until the water boiled and cooked the meat. In a number of hearths at the Wilbur Thomas Shelter we found fire-blackened, broken pieces of hand stones and cobbles which were probably used in stone boiling. Buffalo was dried in strips and pounded into mush and then stored in sacks for winter use (Murphy 1955:307). The Spanish of the Coronado Expedition saw the Querechos do much the same thing with their meat (Wedel 1961:307). Another possible use for the roughened edges on the hand stones found at the shelter would be to pound this dry meat. The Plains Indian women also used a stone hammer to pound meat for pemmican (Johnson 1965:353).

The numerous grinding stones found throughout the various levels of the Wilbur Thomas Shelter point to a heavy dependence on plant foods besides meat. Two of the most important were the serviceberry and chokecherry. The Utes dried the chokecherries and serviceberries and then ground them up on milling stones (Rockwell 1956:44). These were often formed into small cakes which were then stored in skin bags for the winter (Lowie 1924:201). In addition, these two berries were used to make pemmican. The major use of the milling stones and the hand stones found at the site was for grinding berries, but there is no reason why the hand stones could not have been used in a multitude of activities. Some of the hand stone faces show indications of pecking in order to create a more effective grinding surface. Most of these hand stones seem to have been used in a back-and-forth motion. The unshaped milling stones and hand stones used by the Great Basin Shoshoni are very similar to those found at the Wilbur Thomas Shelter (Lowie 1924:204).

Later Occupation. In the later historic period, the shelter was used occasionally by Arapaho, Cheyenne, or other equestrian nomadic groups which passed by the region. They are evidenced by such European trade goods as two copper rings and a cartridge casing.

CONCLUSIONS

Throughout most of its history the shelter was occupied by simple nomadic, pedestrian hunting and gathering peoples. They utilized the site mainly during the summer months when hunting was most productive on the Colorado high plains. In the late summer and early fall they returned to the nearby foothills of the Rocky Mountains where they gathered the harvest of natural plant foods which were so important to their sustenance. In the foothills they were protected from the winter storms which ravage the plains and they could find the necessary game and firewood to survive the winter. In the spring they again set out for the summer hunts on the plains. Except for an increased dependence on hunting during the Late Prehistoric Period they held to their ancient pattern of cyclical nomadism.

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