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PALEOINDIAN MOBILITY AND UTILIZATION OF NIOBRARA OR SMOKY HILL JASPER ON THE SOUTHERN PLAINS

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A number of Paleoindian projectile points manufactured from Niobrara jasper have been documented from western Oklahoma. These specimens represent a small percentage of identified Paleoindian artifacts from the area, but their occurrence provides some information relevant to the study of Paleoindian land use, mobility, and interaction in the region. Clovis, Folsom, Midland, and Plainview points of Niobrara are described here and mention is made of Archaic and Late Prehistoric utilization of Niobrara in the western Oklahoma region. Niobrara jasper Paleoindian points occur in limited frequency, and its rare occurrence as debitage or in early tool samples indicates that southwestern Oklahoma is on the periphery of the region where this tool stone was intensively used.

Niobrara jasper, Graham jasper (Wedel 1986), Niobrarite (Wright 1985), Republican River chert (Stanford 1974), Republican River jasper (Holen 1983), or Smoky Hill jasper (Banks 1990:96) is a distinctive material derived from the Smoky Hill member of the uppermost Niobrara Formation of Cretaceous age in northwestern Kansas (Banks 1990; Merriam 1963; Wedel 1986; Wright 1985) and western Nebraska (Figure 1). Various descriptions of this silicified chalk material are available in the literature and will not be reiterated here (e.g., Holen 1983:44-47; O'Brien 1984:42; Wedel 1986:28-30).

Identification of specimens discussed in this paper are based solely on macroscopic inspection and direct comparison with materials derived from source areas in northwestern Kansas. This material is distinctive enough that macroscopic identification does not appreciably limit the confidence which can be placed in the identifications. Also, it can be noted that no similar material of adequate size and quality for large projectile point production is known to occur naturally in the western Oklahoma region or in the areas to the west which are drained by streams crossing western Oklahoma.

A distinctive characteristic of many Paleoindian assemblages is the utilization of exotic or foreign high quality lithic materials

(Ellis and Lothrop 1989; Goodyear 1989; Hayden 1982; Wheat 1971). Often entire Paleoindian assemblages, including debitage, are dominated by raw material which was derived from sources 100 km or more from the find site (e.g., Hester 1972; Hofman et al. 1990; Hofman and Todd 1990; Knudson 1983; Leonhardy and Anderson 1966; Meltzer 1989:Table 2.2; Wheat 1972). In these cases it is commonly assumed that the materials were acquired directly from the source by the site occupants (Meltzer 1989:24,30). In cases where only a small percentage of an assemblage's tools are manufactured from an exotic material and the material is also rare in the production debris, it is considered plausible that these unusual items were derived from trade between relatively territorial but interacting mobile groups (Hayden 1982).

This distinction between direct and indirect acquisition is, however, extremely problematic and there is no *a priori* reason to assume that direct quarry acquisition of a material will guarantee its dominance in an assemblage especially if other quality lithic sources have subsequently been visited and the materials incorporated into the assemblage (Meltzer 1989:24-25). For highly mobile groups operating over large regions, it can be predicted that there would not be a steady supply of lithics from any given source and that the

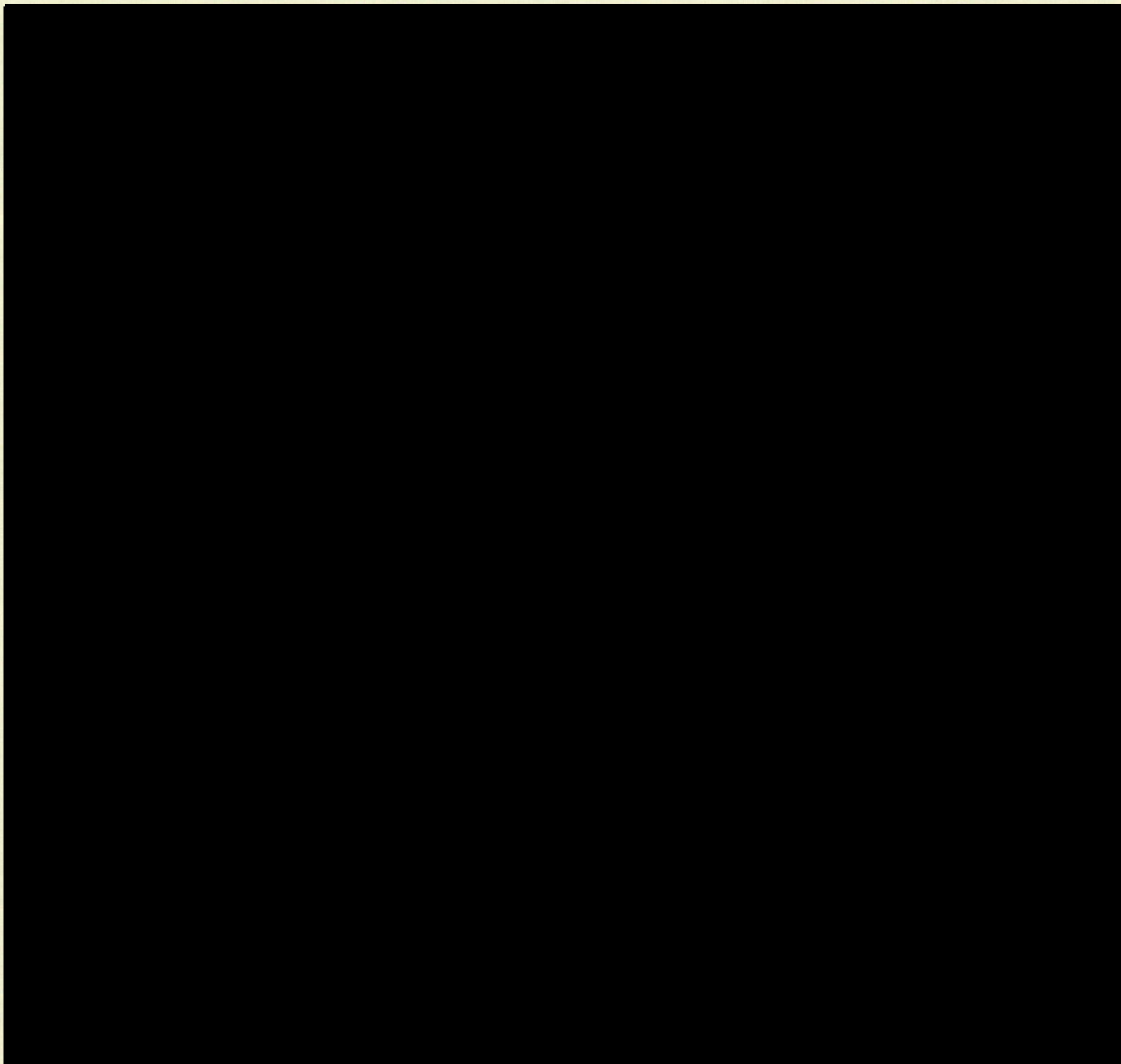


Figure 1. Location of the Niobrara formation in Kansas and artifact find spots in Oklahoma.

supply of tools of any particular source could become severely or almost totally depleted before a subsequent visit to that source was made. Tools may be intensively curated and recycled when made of quality exotic stone, often because such stone was selected for manufacture of highly curated tool forms.

In western Oklahoma it may be assumed that the Niobrara jasper artifacts represent the activities of groups who moved through the region generally from the north, northeast, or northwest. Other lithic sources they may have utilized after they left the Niobrara source area include Alibates from the central Texas

Panhandle and Florence from northcentral Oklahoma and central Kansas. These materials, especially Alibates, are well represented in the Paleoindian artifacts from western Oklahoma.

The technological range in occurrence of Niobrara jasper in Oklahoma Paleoindian assemblages cannot be directly assessed because no discrete Paleoindian assemblages have been excavated which contain Niobrara pieces. Our assessment of the importance and source (trade or direct acquisition) of Niobrara in the assemblages of Southern Plains Paleoindians must therefore be based on the relative frequency of this material among the diagnostic

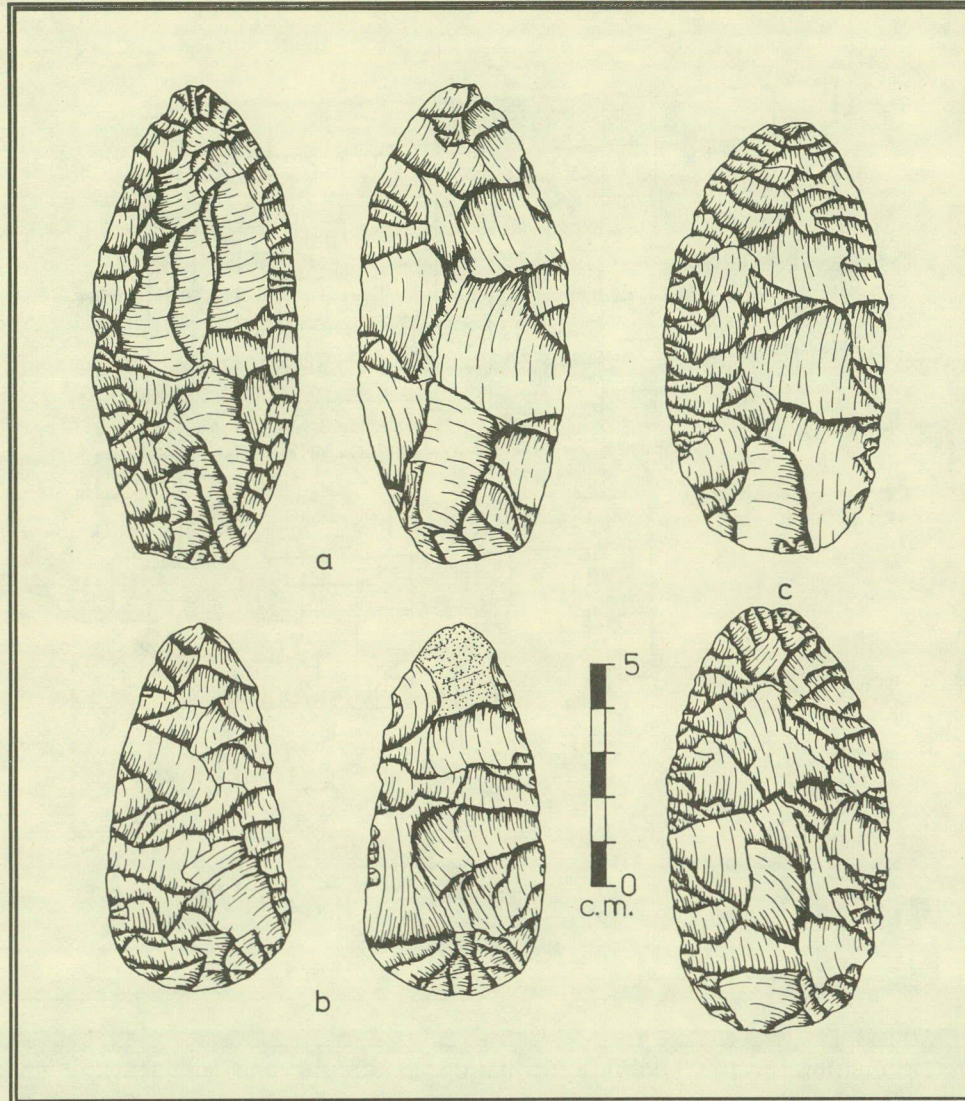


Figure 2. Niobrara jasper bifacial preforms from western Oklahoma.

artifacts recorded at a regional and locality level rather than within specific assemblages. Except for a few distinctive tool or debris types such as graters, spurred end scrapers, channel flakes, and fluted point preforms, the assessment of Paleoindian use of Niobrara jasper in Oklahoma is limited to projectile points. Projectile points are, therefore, the focus of this paper.

Niobrara jasper is relatively rare as lithic debitage on prehistoric sites in western Oklahoma and was most commonly imported as finished tools or blanks. Examples of large bifacial preforms from northern Caddo and

southern Blaine counties include specimens from Cedar Canyon, Caddo County (Specimen CC-336) (Figure 2a); Eichelberger Canyon, Blaine County (Specimen EC-135) (Figure 2b); and Caddo County (Specimen C-1) (Figure 2c). These specimens are probably of Paleoindian or Archaic derivation (metric information on these and other illustrated artifacts is provided in Table 1). Large flakes and flake tools of Niobrara have been found in Oklahoma which cannot unequivocally be assigned to specific cultural complexes (Figure 3c-f). One of these (Figure 3d), from 34OK11, is probably late prehistoric or protohistoric in age based on the site collection. Others are possibly of

Paleoindian origin. These include a large flake tool from a bifacial core (Specimen C-288) from Cedar Canyon, Caddo County (Figure 3c), and a flake tool from a bifacial core (Specimen F-3) from Farra Canyon, Blaine County (Figure 3f). A spurred endscraper from Bear Creek in Custer County (Figure 3g) is undoubtedly Paleoindian, but assignment to a specific complex is not feasible. A small corner-tang knife of Niobrara from Caddo County (34CD70) (Hofman 1971:109), and a larger specimen from Blaine County are also illustrated (Figure 3a-b). These specimens and others from western Oklahoma (e.g., Dale 1976) are presumed to be of Archaic affiliation. The thick endscraper (Specimen CC-664) is of uncertain age but is comparable to pieces from Paleoindian and protohistoric assemblages (Figure 3c).

NIORRARA JASPER PALEOINDIAN POINTS FROM OKLAHOMA

Figure 1 illustrates the location of Niobrara source areas in Kansas and the locations of Niobrara Paleoindian points which have been documented in Oklahoma. These include 1 Clovis (Wallis 1984:16; Wyckoff and Spivey 1984), 3 Folsom (Hofman 1988a:Figure 2e; Hofman and Wyckoff 1987:Figure 1e), 2

Midland, and 2 Plainview specimens (Figure 4). Descriptive information pertaining to these specimens is presented in Table 2.

The Clovis specimen from Roger Mills County (14RM29) has been reworked on the blade edges and has a slightly broken tip (C-1 locality) (Figure 4a). The Caddo County Folsom point is nearly complete with a broken ear and snapped tip (Figure 4b). The specimen is completely bifacially flaked and exhibits a pot-lid thermal fracture on one face. The Caddo County Midland point (C-1 locality) is completely bifacially worked and had apparently been reworked at least once before the tip was last broken (Figure 4f).

The Plainview points are from 34CD199 (Figure 4g) and 34CD304 (Figure 4h), Caddo County. Both have impact damage on their distal ends and one (Figure 4g) has a bending fracture across the base which was probably also caused by impact. This specimen may have been repointed after a previous break which would account for the blade angle. Both of these Plainviews are completely bifacially flaked.

The Harper County Folsom point (34HP1) has a snap fracture across the blade which removed the tip (Figure 4d). The point does

Table 1
Summary information on selected Niobrara artifacts from Oklahoma.

| Figure Number | Artifact Type | Provenience (county) | Length (cm) | Width | Thickness | Weight (gm) |
|---------------|--------------------|----------------------|-------------|-------|-----------|-------------|
| 2a | biface | Caddo | 10.69 | 4.33 | -- | 50.9 |
| 2b | biface | Blaine | 8.26 | 3.82 | -- | 25.03 |
| 2c | biface | Caddo | 9.66 | 4.69 | -- | -- |
| 3a | corner-tang knife | Blaine | (7.32) | 5.21 | .95 | -- |
| 3b | corner-tang knife | Caddo (CD70) | (3.5) | 2.7 | .6 | -- |
| 3c | flake tool | Caddo | 9.53 | 5.0 | 7.82 | 37.53 |
| 3d | flake | Oklahoma (Ok11) | 9.54 | 7.42 | 1.57 | 94.0 |
| 3e | endscraper | Caddo | 5.77 | 3.89 | 1.32 | 28.25 |
| 3f | flake tool | Blaine | 4.24 | 3.44 | .51 | 6.95 |
| 3g | spurred endscraper | Custer | 3.12 | 2.16 | .51 | 4.75 |

Measurements in parentheses are on broken specimens.

not appear to have been reworked and it exhibits no remnant flake blank surface. The 34JK7 Folsom is complete, but given its size and the relatively abrupt tip it may previously have been broken and reworked (Figure 4c).

of projectile points from large flakes, flake tools, or preforms of secondary form or desirability (Hofman 1988b). This would be expected in a region lacking good sources of high quality stone for tool manufacture.

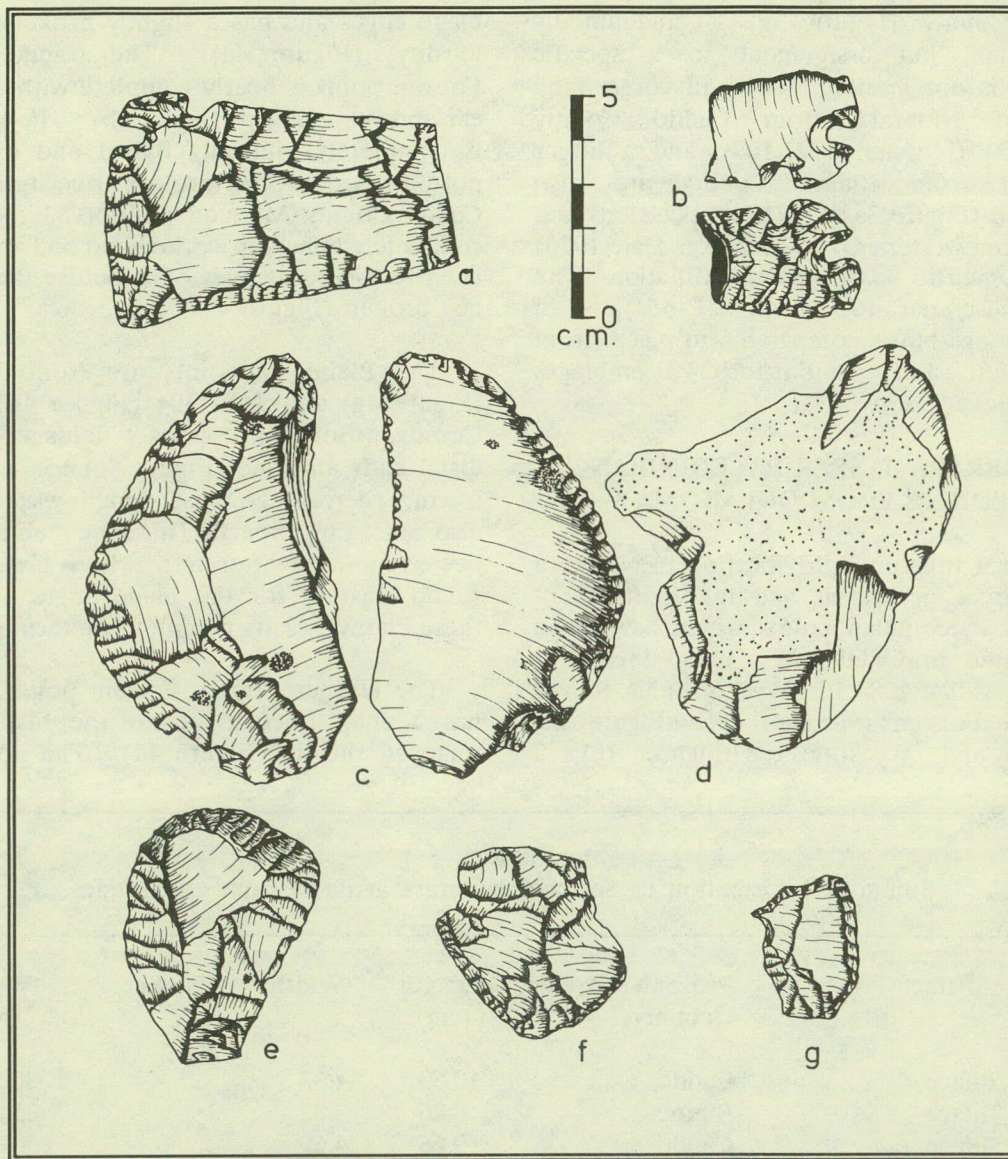


Figure 3. Selected Niobrara jasper artifacts from western Oklahoma.

The Cedar Creek, 34WA6, Midland point tip is the only specimen in this group which exhibits a remnant flake blank surface (Figure 4e). This is a fairly common attribute for Midland, Plainview, and Folsom points from the region and apparently reflects the manufacture

Classification of the 34WA6 specimen as Midland is tentative as it lacks the base and could represent a Plainview. The marginal flaking and morphology of this specimen, however, are more typical of Midland points.

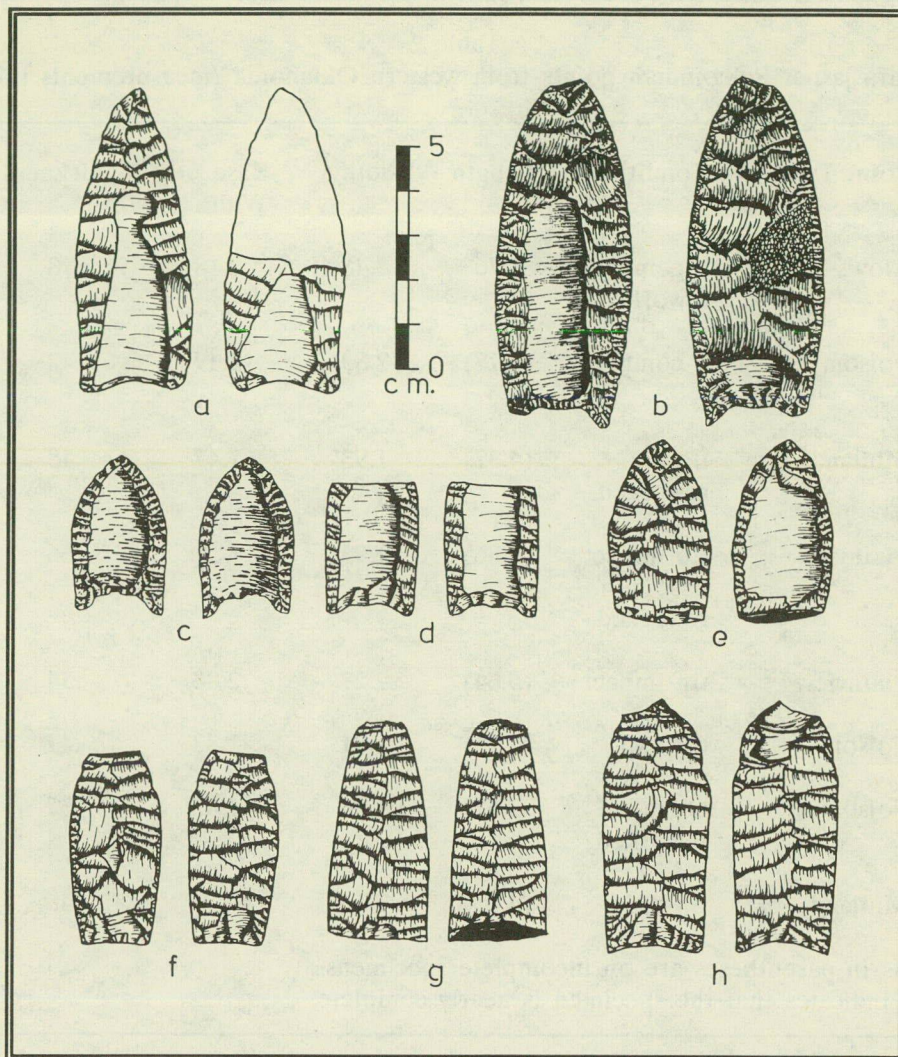


Figure 4. Paleoindian projectile points of Niobrara jasper from western Kansas.

DISCUSSION

In order to gain some perspective on the relative frequency of utilization of Niobrara by Paleoindian groups in western Oklahoma, the relative frequencies of all lithic raw materials represented by Paleoindian projectile points from one locality in west central Oklahoma is considered. White Canyon is located in Caddo County and a few brief papers have been published pertaining to the archaeology of this small drainage basin (Hofman 1974, 1980a, 1980b).

Table 3 provides a summary of Paleoindian

points and fragments from White Canyon. A total of 46 specimens is represented with only 2 (4.3%) being made from Niobrara jasper. These specimens are both good examples of the Plainview type (Figure 4g-h), of which there are 24 specimens documented from White Canyon. The Niobrara specimens represent 8.3% of the Plainview points from White Canyon, whereas Alibates specimens comprise 54% of the Plainview sample.

At the Plainview site in Hale County, Texas, 2 of the 33 specimens (6%) are thought to be Niobrara jasper based on a recent inspection of the collection (see also, Knudson 1983:15,

Table 2
Niobrara jasper Paleoindian points from western Oklahoma (measurements in cm).

| Site | Point Type | Condition | Length | Width | Base Width | Thickness | Flute Thick. |
|------------|------------|------------------------------|--------|-------|------------|-----------|--------------|
| 34RM29 | Clovis | n complete reworked | 6.76 | 2.48 | 2.18 | .78 | - |
| 34CD (C-1) | Folsom | n complete | (7.77) | 2.85 | 2.17 | .42 | .27 |
| 34CD (C-1) | Midland | tip bkn reworked | (4.32) | 1.93 | 1.47 | .48 | - |
| 34CD199 | Plainview | tip impact base bkn reworked | (4.86) | 1.93 | -- | .66 | - |
| 34CD304 | Plainview | tip impact | (5.64) | 2.27 | 2.00 | .54 | - |
| 34HP1 | Folsom | tip bkn | (2.95) | 1.91 | 1.83 | .41 | .30 |
| 34JK7 | Folsom | complete reworked? | 3.52 | 1.96 | 1.82 | .37 | .30 |
| 34WA6 | Midland | tip only | (4.05) | 2.16 | -- | .46 | - |

Measurements in parentheses are on incomplete specimens. "n complete" indicates that the specimen is nearly complete.

Figures 12f, 13c). At Plainview only 6 (18.2%) of the 33 reported pieces are made from Alibates (Knudson 1983:15). Central Texas chert from the Edwards formation is the predominant type at Plainview, but is represented by only 3 (12.5%) of the Plainview points from White Canyon.

The White Canyon sample indicates that Niobrara is only a minor lithic type used by the Paleoindians in west central Oklahoma where approximately 50% of the specimens are made from Alibates flint with its primary source area over 250 km west of White Canyon. For the Paleoindian projectile point sample as a whole, Edwards chert, with source areas in central Texas about 300 km to the south, is represented by nearly one-fourth of the

specimens from White Canyon.

The Oklahoma sample of Niobrara jasper Paleoindian points is fairly evenly distributed as to types, considering the small sample size which is now available. Documentation of the several Folsom specimens is perhaps due to a fairly systematic effort during the past several years to record Folsom specimens from the area (Hofman 1986, 1987a).

If the entire available Folsom sample from Oklahoma is considered, however, the percentage of Niobrara specimens is quite small. At present, 163 Folsom points and preforms are recorded from Oklahoma and only 3 of these (1.8%) are of Niobrara jasper. Approximately 70% (n=101 of 146 specimens

with lithic type information) of the Oklahoma Folsoms and preforms are made from Edwards chert. Edwards is also the predominant lithic material for Folsom samples from western Texas and eastern New Mexico (Hester 1962, 1972; Hofman 1990a, 1990b; Hofman et al. 1990; Hofman and Todd 1990; Johnson 1987). No Niobrara Folsom preforms or channel flakes have been documented in the area to date. The bifacial preforms in Figure 2 are not attributable to a specific Paleoindian or other complex.

Niobrara artifacts are reported from some Archaic and Late Prehistoric sites in northwestern Oklahoma and the Oklahoma panhandle (Dale 1976; Hofman 1987b; Lintz 1976, 1978; Schneider 1969:166). A few of these sites have yielded significant percentages of Niobrara tools and debris (e.g., Drass and Turner 1989:67, Table 9, Appendix A). Brown (1983:139, Figure 1d) reports Niobrara in the form of large bifacial knives from burials at Spiro Mounds on the Arkansas River in extreme eastern Oklahoma. Corner-tang knives manufactured from Niobrara jasper are fairly common in western Oklahoma (Dale 1976:10;

Hofman 1971:109), and a number of unreported Niobrara specimens have been found in the Washita, Caddo, and Blaine county area (Figure 3a-b). The age of these specimens has not been documented, but they are assumed to be Archaic.

To the north and west of the Niobrara jasper source area Paleoindian artifacts of this material are also documented (Myers 1987; Stanford 1974:35, 1975:34, 1978:93). The relative importance of Niobrara compared to Flat Top chalcedony, Spanish Diggings, or others used by Paleoindians in the Nebraska and Colorado area has not been reported. Lithic assemblages from the Red Smoke, Lime Creek, and Allen sites in the Medicine Creek valley of southwest Frontier County, Nebraska, are all dominated by the locally abundant Niobrara jasper (Davis 1962; Holder and Wike 1949; Bamforth 1990). The Paleoindian quarry at the Tim Adrian site in Norton County, Kansas, represents an important source area for early use of Niobrara jasper (O'Brien 1984). Investigation of the distribution of Niobrara jasper to the north and west of its source areas remains an important problem for investigation.

Table 3
Crosstabulation of Paleoindian projectile points from White Canyon,
Caddo County, Oklahoma, by raw material.

| Point Type | LITHIC MATERIAL: | | | | | | Total |
|-------------|------------------|-----------|-----------|-----------|----------|-------------|-------|
| | Alibates | Edwards | Florence* | Quartzite | Niobrara | Fossil-wood | |
| Clovis | 1 | - | - | - | - | - | 1 |
| Folsom | 2 | 1 | - | - | - | - | 3 |
| Plainview | 13 | 3 | 3 | 3 | 2 | - | 24 |
| Agate Basin | 1 | - | - | - | - | 1 | 2 |
| Hell Gap | 1 | 1 | 1 | - | - | - | 3 |
| Cody+ | 1 | 2 | - | - | - | 1 | 4 |
| Allen | 2 | 2 | - | 1 | - | - | 5 |
| Dalton | 1 | 1 | - | - | - | - | 2 |
| Brazos/S.P. | 1 | 1 | - | - | - | - | 2 |
| Totals: | 23(50%) | 11(23.9%) | 4(8.7%) | 4(8.7%) | 2(4.3%) | 2(4.3%) | 46 |

*Florence as used here includes the nearby Neva chert.

+Cody specimens include Scottsbluff and Firstview points.

Brazos/S.P. includes San Patrice and Brazos Fishtail specimens.

The occurrence of this material at sites to the east of the source area has been documented during late Prehistoric times (Holen 1983; Reynolds 1990), and it is the predominant material at the Clovis age Diskau site in northeastern Kansas (Schmits 1987:69).

NIOBRARA JASPER AND PALEOINDIAN MOBILITY ON THE SOUTHERN PLAINS

Recent documentation of the relative frequencies of lithic raw materials for Clovis and Folsom projectile points from the Oklahoma portion of the Southern Plains has demonstrated the relatively rare occurrence of specimens manufactured from Niobrara jasper (Hofman 1987; Hofman and Wyckoff n.d.). There is no obvious *a priori* reason why this should be the case; other materials such as Edwards chert which have equally distant sources are well represented in the Oklahoma sample of fluted points. It is important to note that the Oklahoma Panhandle, the portion of the study area closest to Niobrara jasper sources, has produced no documented Paleoindian projectile points of this material. A dramatic decrease in the occurrence of Edwards chert fluted points in the Oklahoma Panhandle area has also been noted in relation to areas further south (Hofman 1990b; Hofman and Wyckoff n.d.).

The rare occurrence of Niobrara as debitage in early samples and the limited proportion of Paleoindian points from western Oklahoma which are manufactured from this material may reflect either acquisition of Niobrara by intergroup contacts, or direct quarry visits. The similar end result of both types of acquisition on the archaeological record and the problems in distinguishing between them has been discussed by Meltzer (1989:30) who states, "The unfortunate bottom line is that there do not seem to be clear cut rules for sorting direct from indirect acquisition in any deterministic fashion."

If direct quarry visits were made where substantial retooling occurred, we would then expect these mobile groups to transport cores and preforms for future use. This would

eventually result in a broad array of Niobrara tool types and debris classes at sites subsequently visited by such groups. This does not, at present, seem to be the case for Niobrara jasper in western Oklahoma during the Paleoindian period. This suggests that either the southwestern Oklahoma area was beyond the uselife of Niobrara pieces in these assemblages, or that these assemblages never included more than a relatively small percentage of Niobrara. Either explanation is plausible and equally difficult to prove.

The Niobrara pieces could reflect occasional movement or forays into the Southern Plains by groups from further north, or interaction between groups using these different areas. Also plausible is that extremely wide-ranging groups used the entire region, though perhaps different groups with differing emphasis, and the lithic raw material frequencies reflect embedded and logistical exploitation and factors such as the number of use and retooling events after quarry visits, the pattern of movement in relation to lithic sources, situational needs for curation and recycling, and the change in these factors through time.

In contrast to Niobrara, Edwards chert from central Texas is well represented in Paleoindian assemblages in western Oklahoma as a variety of tool forms and as debris (Leonhardy and Anderson 1966; Hofman 1990a, 1990c). This is also true of sites in the Texas panhandle region (Johnson 1987; Hofman et al. 1989) and eastern New Mexico (Hester 1962, 1972; Hofman 1990b).

There is an obvious need for more refined distributional information of raw materials in early assemblages in order that patterns of raw material use, transport, and discard may be defined. Then evaluation of models concerning direct and indirect acquisition can be more realistically evaluated, and the pattern of distribution or fall-off curve (whether abrupt or gradual) for Niobrara south of its source area can be documented.

SUMMARY

Eight Paleoindian projectile points documented from western Oklahoma are manufactured from Niobrara jasper. These points occur at distances ranging from about 200 to 450 km from key Kansas source areas for this material. Clovis, Folsom, Midland, and Plainview specimens are represented, but diagnostic Paleoindian tool forms or lithic debris of Niobrara are extremely rare in the region. This suggests that, unlike Edwards chert from central Texas, the Niobrara material was carried in primarily as completed artifacts or late-stage reduction pieces and that Niobrara comprised only a minor portion of most transported Paleoindian assemblages in the area.

It is probable that the limited occurrence of Niobrara jasper Paleoindian pieces in western Oklahoma, as compared to those made from Alibates and Edwards chert, has considerable significance for study of the mobility patterns and interactions of Southern Plains Paleoindians. While there is good reason to expect that these early hunter-gatherers were not highly territorial, given the probably low regional population and mobile game, it is very possible that their movement patterns were somewhat redundant. During specific time periods, such as Folsom, we might expect the mobility and spatial patterning of activities to vary somewhat from other time periods, such as Clovis, due to changes in climate, vegetation, key prey species, and hunting tactics. Further documentation of lithic resource use on a regional scale should enhance our appreciation of these problems. Documenting the markedly different utilization of Niobrara jasper as compared to Alibates and Edwards chert, and the changing emphasis on use of these materials through time, is a small step toward a more complete understanding of these early Plains hunter-gatherers.

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TEST EXCAVATIONS AT LOVER'S LEAP, 14MY361, A MULTICOMPONENT ROCKSHELTER ALONG THE VERDIGRIS RIVER IN SOUTHEAST KANSAS

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Test excavations were conducted at the Lover's Leap site (14MY461), a southeast facing rockshelter along the Verdigris River in extreme southeast Kansas. A total of four 1x1 m test pits were excavated and quantities of lithic, ceramic, botanical, and faunal artifacts were recovered. These materials indicate the presence of Late Archaic, Early Ceramic (Cuesta and/or Greenwood), and Middle Ceramic (Pomona variant) occupations.

The Lover's Leap site, 14MY361, is located
[REDACTED]
[REDACTED]
[REDACTED] (Figures 1 and 2). Test excavations were conducted by a four person crew over a period of two days in the spring of 1985. Testing consisted of manual excavation of four 1x1 m pits to help discern the vertical and horizontal extent of subsurface deposits.

ENVIRONMENT

Montgomery County has a typical continental climate characterized by large daily and annual variations in temperatures. Winters are cold because of the frequent fronts of polar air. Summers are long and provide a long growing season while spring and fall are generally short. Precipitation is greatest in late spring and early summer. Severe thunderstorms occur occasionally but are local in extent and brief. The site occurs in the Niotaze-Darnell soil complex which occurs on slopes of 8-20%. Niotaze soils are characterized by a dark brown cobbly fine sandy loam surface layer with an underlying brown friable cobbly fine mottled sandy loam. The subsoil is a yellowish red, silty clay with the lowermost portion being a yellowish brown, silty clay loam (Fleming and Campbell 1980). At 14MY361 this complex

occurs with sandstone outcrops.

FIELD METHODS

A site datum, consisting of a piece of white PVC pipe, was established near the base of the cliff face that contains the rockshelter. A site grid was established according to magnetic north. The four test pits were dug as two 1x2 m units. Thus, test pits 1 and 2 form one 1x2 m unit and test pits 3 and 4 form another. These 1x2 m units were dug in arbitrary 10 cm levels with the highest corner of each selected as the beginning level. As a result, test pit 1 had levels 5-14, test pit 2 had levels 1-9, and test pits 3 and 4 had levels 1-5. Level 14 in test pit 1 consisted of an auger hole extending from 130-165 cm below surface. All deposits were dry screened through quarter-inch hardware cloth. Figures 3 and 4 show profiles of the test pits. Test pits 3 and 4 were placed on a relatively flat ground surface while test pits 1 and 2 were placed on the steep slope near the entrance to the rockshelter.

RESULTS

Testing resulted in recovery of a large quantity of lithic, ceramic, and faunal data. The following summarizes materials recovered from the surface and test pits.

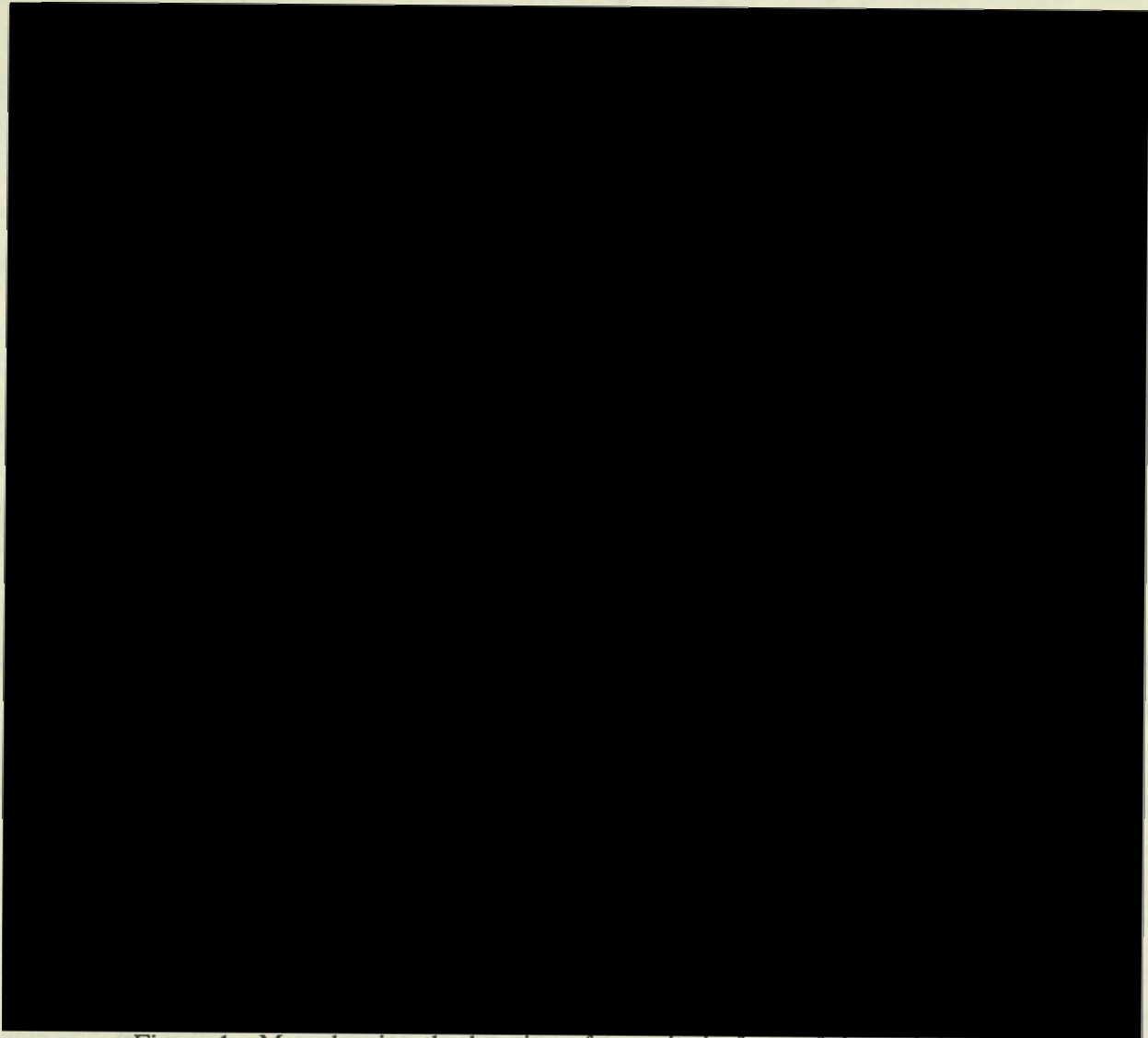


Figure 1. Map showing the location of test pits in front of the rockshelter.

Lithic Assemblage

The excavated lithic assemblage consists of a total of 352 items of which 59 (16.8%) are tools, 56 (15.9%) are shatter, and 237 (67.3%) are flakes (Tables 1 and 2). The debitage, consisting of 56 (19.1%) shatter and 237 flakes (80.9%), is composed almost entirely of interior flakes with no cortex (Table 1). Flakes consist of 16 (6.8%) primary, 27 (11.4%) secondary, and 194 (81.8%) interior. This corresponds with the formal tools which also have a low occurrence of cortex.

For the total flake assemblage, 175 (73.8%)

have a length of less than 2 cm along the axis of force and 110 (46.4%) exhibit evidence of having been heated. The occurrence of lipping for the total flake assemblage is 17 (7.2%) which suggests a low occurrence of soft hammer percussion.

Tools consist of both chipped and ground stone (Table 2). Chipped stone tools include dart/spear points (Figure 5), arrowpoints (Figure 6), graters/perforators, knives, scrapers, resharpening flakes, retouch flakes, utilized flakes, denticulates, and notches. Ground stone tools include metate fragments, pitted or nutting stones, grooved abraders, hammerstones,

and unidentifiable ground stone.

Examination of tool edge angles suggests spatial and stratigraphic differences in site activity areas. Tool edge angles were measured to the nearest 5° with the aid of a goniometer. Using Wilmsen's model for tool edge angles (1968a, 1968b, 1970), tools with edge angles of 40° or less are inferred to have functioned as cutting implements, tools with edge angles of greater than 40 but less than 65° are inferred to have functioned in a number of tasks: primarily skinning, hide preparation, plant/fiber shredding, and bone or horn cutting. Tools with edge angles greater than 65° would be best suited for wood and bone working, skin softening, and heavy plant/fiber shredding.

Tools from the middle levels in test pit 1 are almost entirely generalized tools, best suited for skinning and scraping activities, while tools from the lowest levels include forms best suited for wood/bone working and plant shredding activities. In contrast, tools from the upper levels in test pit 2 are best suited for cutting and wood/bone/plant processing activities, while tools from the middle and lower levels are suitable for a number of tasks.

Tools from the upper levels of test pits 3 and 4 are best suited for cutting and wood/bone/plant processing tasks, while the lower levels in test pit 3 did not contain any tools and the lower levels of test pit 4 have more generalized tool edge angles. There is a discernible spatial separation between dart/spear points and arrowpoints. All 6 dart/spear points were recovered from test pits 1 and 2, located near the opening of the rockshelter, while 8 of the 10 arrowpoints were recovered from test pits 3 and 4. The two arrowpoints from test

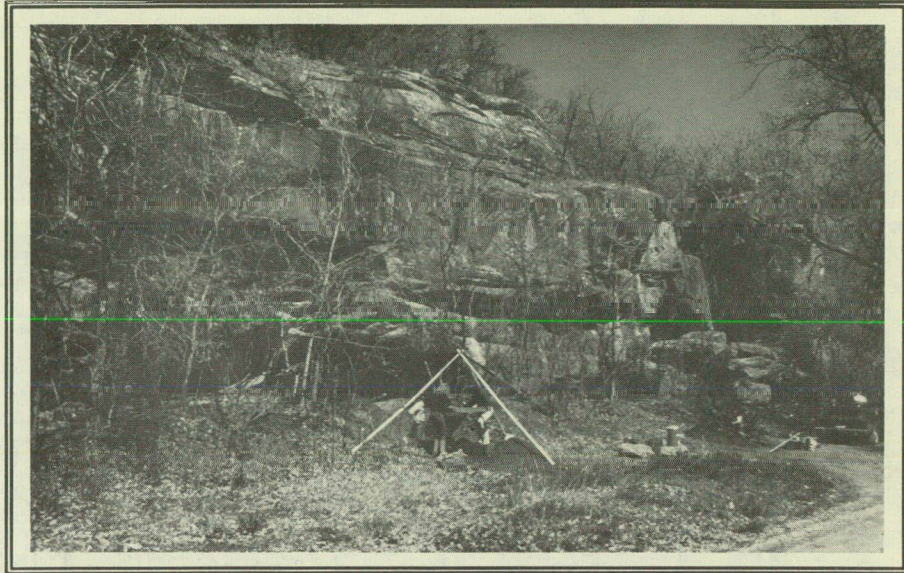


Figure 2. Photograph of the rockshelter looking northeast.

pits 1 and 2 were recovered from levels 8 and 9, respectively. The absence of arrowpoints from the lower levels in test pits 1 and 2 suggests the presence of a Late Archaic occupation.

Ceramic Assemblage

A small ceramic assemblage consists of 2 body sherds from the surface and 18 body sherds and 3 rim sherds from the test pits (Table 3). Nineteen (90%) of the 21 excavated sherds were recovered from test pits 3 and 4. Exterior surface treatment consists of cordmarked (n=12, 57%), floated/smoothed (n=7, 33%), and trailed (n=1, 5%). One specimen has an exfoliated exterior. Interiors are smoothed (n=18, 86%) or scraped (n=3, 14%).

Temper consists of grog (n=8, 38%), shell (n=7, 33%), limestone (n=1, 5%), no temper (n=4, 19%), and indeterminate (n=1, 5%). Two sherds recovered from the surface were tempered with crushed shell. The 2 sherds from test pit 1 were tempered with crushed shell and grog and were recovered from levels 8 and 12, respectively. For the 2 sherds from test pit 2, 1 was tempered with crushed limestone (level 14) and 1 had no temper

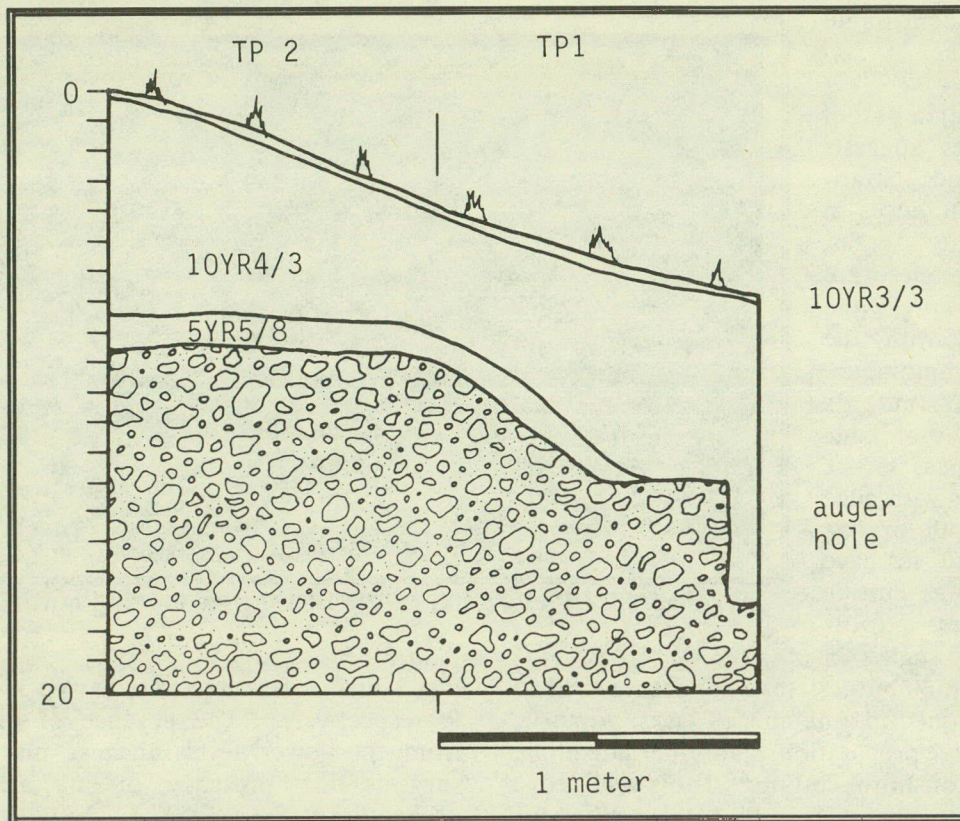


Figure 3. Profile of the east wall of test pits 1 and 2.

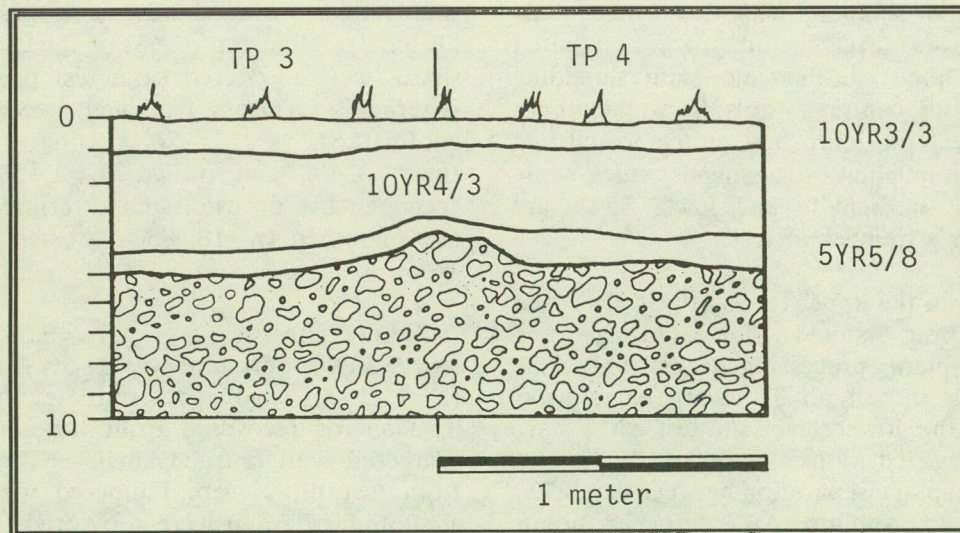


Figure 4. Profile of the north wall of test pits 3 and 4.

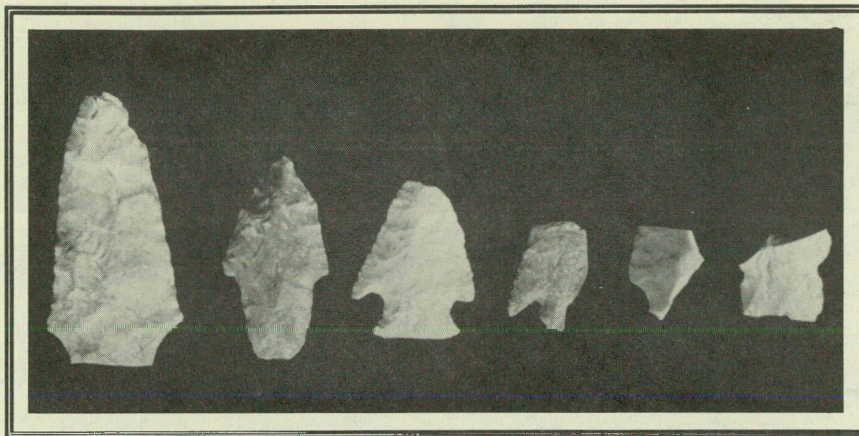


Figure 5. Dart/spear points recovered from test pits.

(level 5). All 4 sherds from test pits 1 and 2 have floated/smoothed exteriors while the 16 sherds from test pits 3 and 4 are predominately cordmarked (n=12, 75%). For test pits 3 and 4 the shell and non-tempered sherds are from the upper levels while the grog-tempered sherds are confined to the lower levels.

Based on ceramics and projectile points, at least three components are represented at the site. The earliest occupation, which is concentrated near the rockshelter opening, is believed to be an as yet undefined Late Archaic component dating sometime between 2000 BC and AD 400. This component was followed by a possible Cuesta or Greenwood phase occupation, which is also concentrated near the rockshelter opening. The Cuesta or Greenwood phase component would date sometime between AD 400 and 1000 (Marshall 1972:225-230; Reynolds 1982, 1984; Witty 1982:213). Because of the small size of the pottery sherds and ceramic assemblage, a more definitive assignment is not possible. The most recent component, which is best represented east of the rockshelter opening in the vicinity of test pits 3 and 4, is believed to be a Pomona variant occupation,

dating sometime between AD 950 and 1400 (Brown 1984; Witty 1967).

Botanical Assemblage

Botanical remains include charred walnut and hickory nutshells. Walnut shell fragments were recovered from levels 7 and 11 in test pit 1, level 5 in test pit 2, and levels 4 and 5 in test pits 3 and 4, respectively.

Hickory nut shells were also recovered from level 5 in test pit 2. The abundance of charcoal would make radiocarbon dating of the site's deposits feasible, with determination of rates of deposition possible. No radiocarbon dates were obtained during the current investigations due to the absence of funding.

Faunal Assemblage

The majority of the freshwater mussels shells and vertebrate remains were recovered from test pits 1 and 2 (Tables 4 and 5). Micro-environments represented by the fauna include aquatic, woodland/forest, forest-prairie edge, and prairie. Although site 14MY361 is multicomponent, the faunal assemblage is not easily separated into individual components.

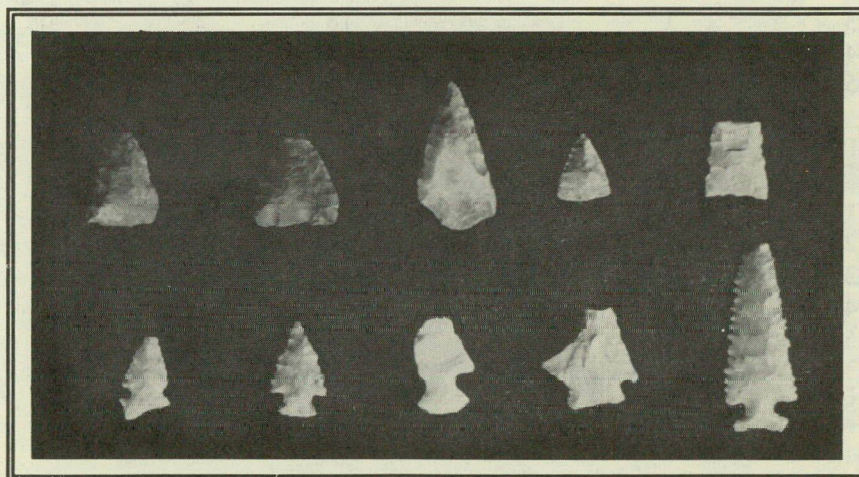


Figure 6. Arrowpoints recovered from test pits.

Table 1
Debitage from Test Pits by Excavation Level

| Test Pit/ Level | Primary | Secondary | Interior | 2 cm | Heat | Lip | Shatter |
|--------------------|---------|-----------|----------|------|------|-----|---------|
| Pit 1 | | | | | | | |
| 5 | - | - | 8 | 3 | 5 | - | 4 |
| 6 | - | - | 5 | 1 | 5 | - | 3 |
| 7 | - | - | 3 | 1 | 1 | - | - |
| 8 | - | 4 | 4 | - | 5 | - | 2 |
| 9 | 1 | - | 7 | 4 | 3 | 2 | 1 |
| 10 | - | - | 7 | 3 | 3 | - | - |
| 11 | 1 | - | 14 | 2 | 5 | - | 1 |
| 12 | - | 1 | 14 | 3 | 5 | 1 | 2 |
| 13 | - | - | 11 | 5 | 3 | 2 | 1 |
| 14 | - | - | - | - | - | - | 1 |
| Pit 2 | | | | | | | |
| 1 | - | 2 | 2 | - | 3 | 1 | - |
| 2 | - | - | 2 | - | 2 | - | - |
| 3 | 1 | 2 | 3 | 2 | 4 | - | 1 |
| 4 | 1 | 1 | 9 | - | 5 | 1 | - |
| 5 | - | - | 7 | 2 | 2 | - | 5 |
| 6 | - | 1 | 5 | 3 | 2 | - | 3 |
| 7 | 1 | - | 4 | 3 | 4 | 2 | - |
| 8 | - | 2 | 7 | 6 | 2 | 1 | 1 |
| 9 | 1 | 2 | 5 | 5 | 5 | 2 | 1 |
| Pit 3 | | | | | | | |
| 1 | - | 1 | 7 | 3 | 3 | 1 | 3 |
| 2 | 1 | 1 | 2 | 2 | 3 | 1 | 1 |
| 3 | 1 | 3 | 18 | 2 | 6 | 1 | 9 |
| 4 | - | - | 3 | - | 2 | - | 1 |
| 5 | - | - | 2 | - | 2 | - | - |
| Pit 4 | | | | | | | |
| 1 | - | - | 1 | - | 1 | - | - |
| 2 | 4 | 4 | 23 | 6 | 14 | 1 | 1 |
| 3 | 3 | 1 | 15 | 1 | 8 | 1 | 12 |
| 4 | - | 1 | 2 | 2 | 2 | - | - |
| 5 | 1 | 1 | 5 | 3 | 5 | - | 3 |
| Surface | - | 1 | 1 | - | 2 | 1 | - |

Table 2
Stone Tools From Test Pits by Excavation Level

| tool type | test pit 1 levels | | | | | | | | | | | | | | test pit 2 levels | | | | |
|---------------------|-------------------|---|---|---|---|----|----|----|----|----|---|---|---|---|-------------------|---|---|---|---|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| darts | - | - | 1 | - | 1 | - | - | 1 | 1 | - | - | - | - | - | 2 | - | - | - | - |
| arrows | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
| gravers | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| knives | - | - | 1 | - | - | 1 | 1 | - | - | - | - | - | - | 1 | - | - | - | - | - |
| scrapers | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| resharpening flakes | - | - | - | - | 1 | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| retouched pieces | - | - | - | 1 | 2 | 1 | - | 1 | - | 1 | - | - | - | 2 | - | 1 | 2 | 2 | - |
| utilized pieces | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | 2 | - | - | 2 | - |
| denticulates | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| notches | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - |
| metates | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| pitted stones | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| grooved abraders | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - |
| other ground stone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| cores | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| tool type | test pit 3 levels | | | | | test pit 4 levels | | | | | surface | |
|---------------------|-------------------|---|---|---|---|-------------------|---|---|---|---|---------|---|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | | |
| darts | - | - | - | - | - | - | - | - | - | - | - | - |
| arrows | 1 | - | 2 | - | - | - | 3 | 2 | - | - | - | - |
| gravers | 1 | - | - | - | - | - | - | 1 | - | - | - | - |
| knives | - | - | 1 | - | - | - | - | - | - | - | - | - |
| scrapers | - | - | - | - | - | - | - | 1 | - | - | - | - |
| resharpening flakes | - | - | - | - | - | - | - | - | - | - | - | - |
| retouched flakes | 1 | - | 1 | - | - | - | - | - | 1 | 1 | - | - |
| utilized pieces | - | - | - | - | - | - | - | - | 1 | - | - | - |
| denticulates | - | - | - | - | - | - | - | - | - | - | - | - |
| notches | - | - | - | - | - | - | - | - | - | - | - | - |
| metates | - | - | - | - | - | - | - | 1 | - | - | - | - |
| pitted stones | - | - | - | - | - | - | - | 1 | - | - | - | 1 |
| grooved abraders | - | - | - | - | - | - | - | - | - | - | - | - |
| other ground stone | - | - | - | - | - | - | - | 1 | - | - | - | - |
| cores | - | - | - | - | - | - | - | - | - | 1 | - | - |

Therefore, the assemblage is examined as a whole.

Mussel Shell Assemblage. A large sample, 5.8 kg, of freshwater mussel shells, representing at least 11 genera (13 species), was recovered primarily from test pits 1 and 2 (Table 4). A minimum of 287 valves are present, with only 1 and 4 valves being recovered from test pits 3 and 4, respectively. Of these, 149 were identifiable to species (Table 4). The majority of the mussel shell assemblage is represented by the three-ridge, bullhead, hickory-nut, and

kidney-shell mussels. The latter two have been extirpated in Kansas since 1890 (Murray and Leonard 1962:158).

Although mussel shells were used by prehistoric peoples for the manufacture of items such as beads and pendants, no worked shell was discerned. However, the quantity and condition of the recovered shell suggest mussels were harvested as a food resource. Although mussels usually burrow deeply into river bottoms during the winter, they are accessible the rest of the year. However, due to lower

Table 3
Ceramics From Test Pits by Excavation Level

| | pit 1 level | | | | | pit 2 level | | pit 3 level | | | | | pit 4 level | | | | | | | |
|---------------|-------------|---|---|---|---|-------------|----|-------------|---|---|---|---|-------------|---|---|---|---|---|---|---|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| temper | | | | | | | | | | | | | | | | | | | | |
| none | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | 2 | - | - |
| grog | - | - | - | - | - | - | - | 1 | - | - | - | - | 1 | - | 2 | - | - | - | 2 | 2 |
| shell | - | - | - | 1 | - | - | - | - | - | - | 1 | 1 | 1 | - | - | - | - | 2 | 1 | - |
| limestone | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| indeterminate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |

Surface 2 shell tempered body sherds

water levels, late summer and early fall were probably the ideal times to collect mussels (Keene 1981:127). Direct data are lacking, but the mussels were probably gathered by hand or with the aid of a stick when water was low and/or clear. They may have been prepared for consumption by being baked, boiled, or steamed.

The status of mussels as a major food resource is doubtful. Nutritionally, shellfish rank fairly high in protein content per unit weight; however, enormous quantities must be consumed in order to maintain adequate protein/calorie levels (Wedel 1986:127). On the other hand, mussels have a high calcium content (Keene 1981:136, 178). Therefore, mussels probably functioned as a food supplement (Parmalee and Klippel 1974:432) or perhaps as a "starvation" food (Lyman 1984:98) when other food resources were in short supply.

Vertebrate Assemblage. Bone preservation was excellent. The total vertebrate faunal assemblage consists of 1,673 bone specimens, including teeth (Table 5). Of these, 515 (30.8%) were identified. A specimen was considered identifiable if at least the vertebrate class and element could be determined. A total of 93 specimens (18% of the total identified bones) could not be identified beyond this basic level. The remaining 422 specimens (82% of the total identified bone) consist of 1 family and 20 genera and species, of which 18 occurred in test pit 1. Test pits 3 and 4 yielded only 5 specimens that could be identified. With

the exception of amphibians, all major vertebrate classes are represented in the assemblage (Table 5).

Fish, consisting of 4% of the total identified specimens, are represented by gar, suckers, and catfish. These were probably exploited as secondary food resources by the site inhabitants. A variety of methods have been employed by various peoples for procuring fish. These techniques include use of the spear, leister, harpoon, bow-and-arrow, weir, trap, hook and line, and a variety of nets (Parmalee et al. 1972:22). Gars live on the bottoms of deep pools in winter, but in summer they inhabit surface-waters (Cross 1967:44). They are easily approached at these times. Prehistorically, gars may have been caught in nets and/or by snagging. Historically, gar have often been taken in gill nets because their long jaws are easily entangled (Cleland 1966:172). Since suckers are bottom dwellers, they were probably caught in nets or traps. On occasion, suckers may also have been speared in shallow water. Prehistorically, catfish may have been easy to trap in nets and/or to spear while in shallow water. In addition, catfish may also have been caught on hooks.

During spawning, large fish congregate in shallow water near the shore. At these times, it was probably feasible to spear the fish (Parmalee et al. 1972:23). It was also possible to get fish when water levels were lowered in rivers and streams. During these periods, fish became concentrated in smaller, shallower areas

Table 4
Unionid Mussels From Test Pits by Excavation Level

| Genus/species | pit 1 levels | | | | | | | pit 2 levels | | | | | | | pit 4 levels | |
|-----------------------------------|--------------|---|---|---|---|----|----|--------------|---|---|----|---|---|---|--------------|---|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 9 |
| <i>Amblema plicata</i> | 4 | 4 | 9 | 4 | 6 | 3 | - | - | 1 | 3 | 7 | 7 | 1 | 2 | - | - |
| <i>Cyclonaias tuberculata</i> | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| <i>Cyprogenia aberti</i> | - | 4 | - | 2 | - | - | - | - | - | - | 1 | - | - | - | - | - |
| <i>Ligumia recta</i> | - | - | - | 1 | - | - | - | - | - | - | 1 | - | - | - | - | - |
| <i>Lampsilis</i> sp. | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| <i>Obovaria olivaria</i> | 3 | 1 | 4 | 9 | 4 | 1 | 2 | - | 1 | 2 | 13 | 2 | 1 | 2 | - | 1 |
| <i>Plethobasus cyphus</i> | - | - | - | 3 | - | 1 | 1 | 1 | - | 2 | 3 | 2 | 1 | - | - | - |
| <i>Proptera alata</i> | - | 1 | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - |
| <i>Proptera purpurata</i> | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - |
| <i>Ptychobranchnus fasciolare</i> | 2 | 1 | - | 1 | - | - | - | - | - | - | 5 | 2 | 2 | - | - | - |
| <i>Quadrula cylindrica</i> | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
| <i>Quadrula pustulosa</i> | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - |
| <i>Quadrula quadrula</i> | - | - | - | - | 2 | - | - | - | - | - | - | - | 1 | - | - | - |
| <i>Quadrula</i> sp. | - | - | - | - | - | - | 1 | - | - | - | 1 | - | - | - | - | - |
| <i>Tritogonia verruscosa</i> | - | 1 | 1 | - | - | - | - | - | - | - | - | 2 | - | - | - | - |

and were probably caught by hand. Large bottom feeders were stranded in deep holes and became easy prey. The Pawnee took fish in this way, often fishing with a decorticated willow stick mat (Weltfish 1965:231). The Omaha sometimes shot or speared fish. They also used a movable weir of willows to drive fish into shallow water where the fish could then be shot, speared, or caught by hand (Fletcher and La Flesche 1911:312). It is

probable that a variety of fishing techniques were employed by the inhabitants of the site.

Turtles, consisting of 18% of the total identified specimens, are represented by remains of the mud turtle, box turtle, and basking turtle (Table 5). No worked turtle shells were recovered; however, the amount and condition of the turtle remains suggest that turtles were eaten. They are an important source of calcium

(Keene 1981:137,165). Although box turtles may have been easy to obtain by simply picking them up when observed, special techniques were probably necessary to acquire the aquatic species. The Cheyenne used a variety of methods for obtaining aquatic turtles by hand

(Grinnell 1923:307). Some were caught as they came to the surface to breathe. The underwater locations of turtles were discerned by long lines of people wading in the water and feeling for the submerged turtles with their feet. The turtles were grasped by hand as they tried

Table 5
Identified Vertebrate Taxa by Test Pit

| Taxon | test pit | | | |
|---|----------|---|---|---|
| | 1 | 2 | 3 | 4 |
| OSTEICHTHYES (BONY FISH): | | | | |
| <i>Lepisosteus</i> sp. (Gar) | + | - | - | - |
| Catostomidae (Suckers) | + | - | - | - |
| <i>Ictalurus punctatus</i> (Channel Catfish) | - | + | - | - |
| <i>Ictalurus</i> sp. (Catfish) | - | + | - | - |
| Indeterminate Fish | + | + | - | - |
| REPTILIA (REPTILES): | | | | |
| <i>Kinosternon</i> sp. (Mud Turtle) | + | - | - | - |
| <i>Terrapene</i> sp. (Box Turtle) | + | + | - | - |
| <i>Chrysemys</i> sp. (Basking Turtles) | + | + | - | - |
| <i>Graptemys/Chrysemys</i> (Map/Basking Turtles) | - | + | - | - |
| Indeterminate Turtle | + | + | - | - |
| <i>Crotaphytus collaris</i> (Collared Lizard) | - | + | - | - |
| AVES (BIRDS): | | | | |
| <i>Tympanuchus cupido</i> (Greater Prairie Chicken) | + | - | - | - |
| <i>Meleagris gallopavo</i> (Turkey) | + | + | - | - |
| Indeterminate Medium Bird | + | - | - | - |
| Indeterminate Large Bird | + | + | - | - |
| MAMMALIA (MAMMALS): | | | | |
| <i>Sylvilagus</i> sp. (Cottontail) | + | + | - | - |
| <i>Sciurus</i> sp. (Squirrel) | + | + | - | - |
| <i>Geomys</i> sp. (Pocket Gopher) | + | + | - | - |
| <i>Castor canadensis</i> (Beaver) | + | + | + | - |
| <i>Neotoma floridana</i> (Eastern Woodrat) | + | - | - | - |
| <i>Microtus ochrogaster</i> (Prairie Vole) | + | - | - | - |
| <i>Canis</i> sp. (Dog/Coyote) | + | + | - | + |
| <i>Procyon lotor</i> (Raccoon) | + | + | - | - |
| <i>Taxidea taxus</i> (Badger) | + | - | - | - |
| <i>Odocoileus virginianus</i> (White-tailed Deer) | + | + | + | + |
| <i>Bison bison</i> (Bison) | + | + | - | - |
| Indeterminate Medium Mammal | + | + | - | - |
| Indeterminate Large Mammal | - | + | - | - |
| + present | | | | |
| - absent | | | | |

to escape or as they were held in place by a foot. Sometimes the turtles were surrounded in the water. As the people slowly closed in, some of the turtles moved to the center of the circle where they were eventually caught by hand. Similar strategies may have been employed at this site.

Birds, consisting of 3% of the identified vertebrate assemblage, are represented by the greater prairie chicken and the turkey (Table 5). Both are earthbound game birds. The prairie chicken inhabits tall-grass prairies and the turkey prefers open woodlands and forests with scattered clearings. The Omaha killed prairie chickens with headless arrows that were sharpened (Fletcher and La Flesche 1911:451). The paucity of avian remains (N=17) and the presence of only one turkey-size ulna shaft fragment with slight cuts precludes any assessment of processing techniques.

The mammalian fauna (N=386), comprising 75% of the identified vertebrates, is dominated by deer (n=278, MNI=7), cottontail (n=35, MNI=5), and raccoon (n=17, MNI=3) (Table 6). Virtually the entire deer skeleton is represented, but it is highly fragmented. Butcher marks, in the form of skinning, dismembering, and filleting cuts, are present on some of the deer bones. In addition, cut marks are present on a canid femur and on a raccoon jugal fragment. A large portion of the unidentifiable specimens are fragments of deer-size long bones. These bones are high in marrow content and their fragmented condition suggests that the inhabitants of the site were processing deer long bones for marrow extraction and bone grease.

Deer was probably the primary food resource. However, the presence of two bison elements within the assemblage suggests that bison were at least opportunistically added to the diet when they were present within the vicinity of the site. On the other hand, if bison were procured at some distance from the site, the bones would have been subject to the "schlepp effect" where only select portions were carried back to the site. Thus, fewer bison bones would have been brought to the site.

In addition to the identifiable bone, the vertebrate assemblage contains 10 worked specimens. These include 3 probable awls (1 is made from a metatarsal and the other 2 are indeterminate), an ulna awl or spatula, 2 expediency tools (possibly awls), 1 probable bead, and 3 grooved-and-snapped fragments. One of the latter is on a distal shaft fragment of a medium-size bird tibiotarsus, suggesting that it is bone bead manufacturing refuse.

In conclusion, with the exception of amphibians, each of the major faunal classes is represented in the faunal assemblage from the site. The majority of the faunal specimens were recovered from test pits 1 and 2. The location of these pits near the mouth of the rockshelter indicates that most of the activities involving animal processing occurred in the vicinity of the rockshelter mouth and faunal refuse was conveniently discarded nearby.

A wide variety of food resources was available for exploitation in the vicinity of the site. Deer dominates the vertebrate assemblage. However, the diversity of recovered animal remains suggests that the subsistence was diffuse, not focal.

CONCLUSION

Limited testing at site 14MY361 yielded a variety of cultural remains representing approximately 4000 years of at least intermittent occupation. Prehistoric components discerned include an undefined Late Archaic (2000 BC-AD 400), a Cuesta and/or Greenwood phase (AD 400-1000), and Pomona variant (AD 950-1400). The high frequency of lithics and faunal remains, recovered in primary context, indicate the potential of the site for yielding significant information regarding Late Archaic, Early Ceramic, and Middle Ceramic period occupations in southeastern Kansas.

Acknowledgements. The authors would like to thank Dan and Marianne Wildcat, of Lawrence, Kansas, for bringing the site to the attention of the authors and for their generous help in conducting the test excavations. The authors also thank Mr. Thomas Witty, Jr., Kansas State Archeologist, for providing site landowner information and site file records. The landowners, Mr. and Mrs. Robert

Muller, are gratefully thanked for allowing the authors to conduct test excavations on their property. All contents

and opinions of the paper are the responsibility of the authors.

Table 6
Identified Vertebrate Taxa:
NISP and MNI*

| Taxon | NISP | MNI |
|---|------|-----|
| OSTEICHTHYES (BONY FISH) (N=19): | | |
| <i>Lepisosteus</i> sp. (Gar) | 1 | 1 |
| Catostomidae (Suckers) | 1 | 1 |
| <i>Ictalurus punctatus</i> (Channel Catfish) | 1 | 1 |
| <i>Ictalurus</i> sp. (Catfish) | 3 | 1 |
| Indeterminate Fish | 13 | - |
| REPTILIA (REPTILES) (N=94): | | |
| <i>Kinosternon</i> sp. (Mud Turtle) | 1 | 1 |
| <i>Terrapene</i> sp. (Box Turtle) | 29 | 2 |
| <i>Chrysemys</i> sp. (Basking Turtles) | 15 | 1 |
| <i>Graptemys/Chrysemys</i> (Map/Basking Turtles) | 2 | - |
| Indeterminate Turtle | 46 | - |
| <i>Crotaphytus collaris</i> (Collared Lizard) | 1 | 1 |
| AVES (BIRDS) (N=17): | | |
| <i>Tympanuchus cupido</i> (Greater Prairie Chicken) | 1 | 1 |
| <i>Meleagris gallopavo</i> (Turkey) | 4 | 1 |
| Indeterminate Medium Bird | 6 | - |
| Indeterminate Large Bird | 6 | - |
| MAMMALIA (MAMMALS) (N=386): | | |
| <i>Sylvilagus</i> sp. (Cottontail) | 35 | 5 |
| <i>Sciurus</i> sp. (Squirrel) | 2 | 1 |
| <i>Geomys</i> sp. (Pocket Gopher) | 6 | 1 |
| <i>Castor canadensis</i> (Beaver) | 8 | 1 |
| <i>Neotoma floridana</i> (Eastern Woodrat) | 2 | 1 |
| <i>Microtus ochrogaster</i> (Prairie Vole) | 1 | 1 |
| <i>Canis</i> sp. (Dog/Coyote) | 10 | 1 |
| <i>Procyon lotor</i> (Raccoon) | 17 | 3 |
| <i>Taxidea taxus</i> (Badger) | 2 | 1 |
| <i>Odocoileus virginianus</i> (White-tailed Deer) | 278 | 7 |
| <i>Bison bison</i> (Bison) | 2 | 1 |
| Indeterminate Medium Mammal | 20 | - |
| Indeterminate Large Mammal | 2 | - |

*NISP: Number of Identified Specimens
MNI: Minimum Number of Individuals

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NEW LIGHT ON "THE CORONADO STONE"

Any experienced researcher, and John Peterson is a good example, knows that there are always "stones left unturned" and that research is never really complete. Indeed, it is often the very act of making public our research through publication that new and important information comes to light through leads and insights provided by interested readers. John's research on the so-called "Coronado stone" (Volume 10, Nos. 1 and 2) is a perfect example of this.

Only months after the first *The Kansas Anthropologist* was published with a lead article on the "Coronado stone" I received a letter from Merry Charlsen, Ralph Steele's daughter, accompanied by a newspaper article by Mr. Steele. These are self-explanatory and are reprinted below in full. Later, an article by Associated Press writer John Saylor of Lyons reported the rediscovery of the "Coronado stone" in Rice County's Coronado-Quivira Museum. To Mr. Peterson's credit, he had checked with the Rice County Historical Society and received a report that they did not possess this artifact (see page 8 of John's article). Following is John Peterson's response to this new information along with Merry Charlsen's letter and her father's article from the *Atchison Globe*.

William B. Lees

JOHN PETERSON RESPONDS

When my article on the "Coronado stone" was published in *The Kansas Anthropologist* it was my hope the story would cause someone to come forward with the name of the originator of the hoax. The letter and clipping from Merry Charlsen, reprinted below, provides that information and more, and I wish to thank her for making the clipping available to us, particularly who had carved the message on the stone.

I'm sure Ralph Steele greatly enjoyed the "row" caused by his handiwork and suspect he put a little more effort into preparing it than

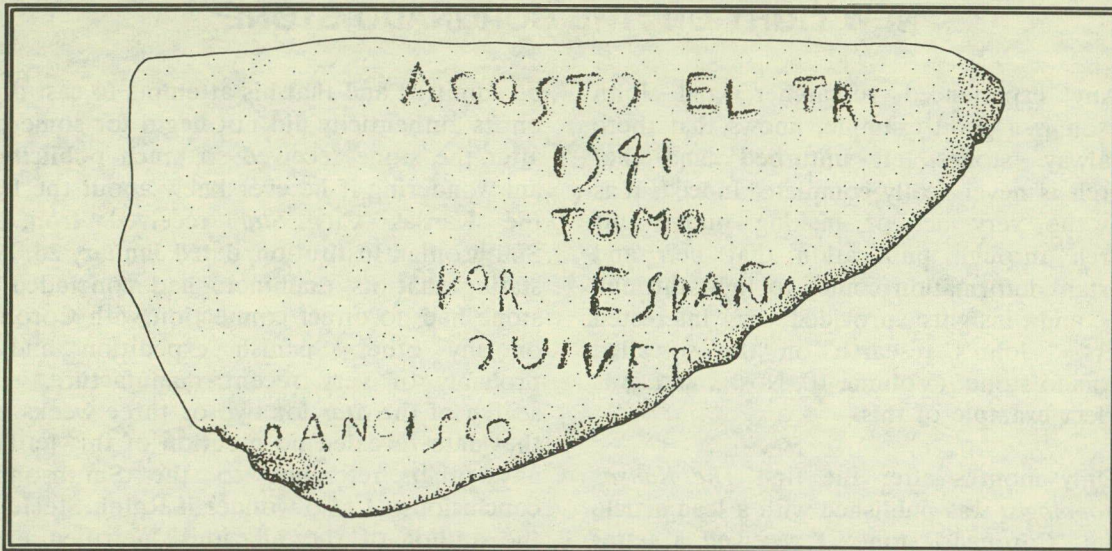
he admitted and that his attempts to cast doubt on its authenticity did not begin for some time after the stone received so much publicity. I am wondering if he ever knew about the letter the *Kansas City Star* received from the Smithsonian Institution, dated January 26, 1938, stating that its examiners had concluded the stone had no direct connection with Coronado or any other Spanish expedition and "is probably of very recent manufacture." My search of the *Star* for two or three weeks after that date revealed no mention of this letter or any other reference to the Smithsonian's conclusions. I also wonder if Ralph Steele was the author of the hilarious "petrified apple" story published in the *Atchison Daily Globe* on July 21, 1937. My guess is that he was.

Shortly after learning of Ms. Charlsen's letter I was quite surprised to read in the *Lawrence Journal World* for May 20, 1990, that the "Coronado stone" had resurfaced in Lyons, Kansas. Presumably this is the same stone Margaret Whittemore saw in the Rice County court house in the early 1950s. As I mentioned in my article, the Coronado-Quivira Museum in Lyons in 1987, when I was trying to locate the stone, had no record or knowledge of such an item (being a volunteer curator in a county museum, I can readily recognize how a piece of rock, an old bible, or even something much larger can disappear for months or years and then materialize when someone happens to look in the "right" storage place). So it seems the only remaining mystery concerning the "Coronado stone" is how it got from Kansas City to Lyons and I don't believe I will concern myself with that subject.

John Peterson
August 1990

A LETTER FROM MERRY CHARLSEN

I read your article with interest and surprise since my father tried to kill interest in the stone for so many years. He wrote the enclosed article for the *St. Joseph Gazette* some years ago and at another time, told the story to



"The Coronado stone"

Margaret Schwein who ran an article in the *Atchison Globe* on Wednesday, November 16, 1966.

My father, Ralph Steele, spent most of his life working for different newspapers in Kansas or Missouri, usually in the composing room. He was a very intelligent, self-taught man with many interests who loved stirring people up. He spent his retirement years writing letters to the editor, usually the *Atchison Globe*, and is remembered by many here with fondness as someone who supported the interests of the "common or little" man. He died four years ago at his home in Atchison where he had lived for over 30 years.

Merry Charlsen
April 1990

HOW A TREMENDOUS HOAX MADE PRINT

By Ralph Steele

Originally published in the St. Joseph, Missouri, *Gazette*

While scanning the news the other morning, I found one item more interesting than my breakfast coffee--the learned men of science had found the long-famous Piltdown man to be a phony. This skeleton, dug out of an English gravel pit almost forty years ago and

declared to be a genuine "missing link," has the jawbone of a modern ape (so they now discover) and the head of a real fossil.

The hoax is now being laid at the doorstep of some unknown practical joker. And that part of the item is what interests me. I would like to meet that practical joker. We are kindred souls. He is a person, like myself, who would like to be funny--but isn't.

Planting a harmless little firecracker like that Piltdown man that explodes in your face is right down my alley. It reminds me of the time I dug up the "Coronado stone" down by Oak Mills, Kansas, and then almost ran myself silly trying to "bury" it again.

Star Correspondent

It all started in fun--I thought. I was a correspondent for the *Kansas City Star* at the time, and when I wasn't snooping around for something to write about I was looking for some form of amusement that didn't cost anything--those were depression years, back in the thirties, remember?

While chatting one day with a fellow scribe (each of us considered ourselves the world's best) we were amusing ourselves by kidding each other's ability. In short, my "friend"

claimed to have written ten features for each one I had composed; and I declared quality was more important than quantity and I could "manufacture" a better story than he could find.

And that was what I proceeded to do. On my way home I picked up a likely looking rock by the roadside and that evening, with cold chisel and hammer, went into the monument-cutting business. Drawing from my scant knowledge of early American history, and my equally slight knowledge of the Spanish language, I put on the stone that Francisco Vasquez de Coronado was claiming all this land for Spain. After sandpapering the lettering to a smooth "weathered" condition, I bounced the rock up and down in a mud puddle a few times to "age" it, and had my "material."

Little Feature Story

Then I wrote what I fondly hoped would be an amusing little feature story--all about how the misguided folk who live along the Missouri River bluffs had for years considered this marker a gravestone for some long-deceased Indian. Gee whiz, in my ignorance I supposed everyone knew Coronado had wandered all over this neck of the woods, and that his relics were "a dime a dozen."

But that story had hardly hit the *Star* state editor's desk when I got a long distance phone call excitedly asking if I still had that stone. Of course I still had it, and within two hours a carload of "archeologists" and reporters from Kansas City pulled up at my house in Effingham, Kansas.

In sheer terror, my wife had dashed over to "visit" at the neighbor's until the storm blew over. And I was holding fast to my time-honored motto: "Whatever you do, don't plead guilty to nothing!" So I just sat tight and let the experts do the talking.

Then Fun Began

They bought my stone (I really wanted to give it to them, and I tried) and proudly and tenderly bore it back to Kansas City. And then the fun began--and how the fur and four-

syllable words flew among the learned men of archeology. The Smithsonian Institution, the Southwest Museum of Natural History (I believe that is the correct title), every would-be authority on Coronado lore and all the newspapers in this part of the country got in on the act, while I sweated it out and wondered how on earth I had accidentally happened to pull the wrong switch.

At first I tried to "kill" the thing quietly by scoffing at it--declaring that I thought it was a phony. But some learned man popped up with the declaration that only three living men knew the exact date on which Coronado would have been here, if he had really been here--August 3. Could I tell him I had intended to carve Agosto el treinta and had run out of rock on "tre-?"

And some expert chemist swore the carving was either at least sixty years old or someone with an exceptional knowledge of chemistry had skillfully "aged" it. I guess he had never heard of bouncing a rock up and down in a mud hole a few times. And all this time I was wanting to laugh--but was scared to!

Nobody Laughed

Goodness knows how far I would have let them go with the thing. I sure didn't want to plead guilty, because the *Star* had bawled me out a couple of times before about feature stories that had bordered on "fiction." But by the time the "professors" started discussing the necessity for altering the history books to extend Coronado's little junket up into Atchison county, my wife's remonstrances were getting too bitter to live with. So I broke down and gave out with the details and reason for my "harmless" prank.

Did anyone laugh? They did not! They dropped my rock like a hot potato, and they hate me to pieces.

If whoever planted the Piltdown man would accept a bit of advice from another misguided comedian, he will remain incognito. Because he is sure to get in the soup again with other jokes that backfire--it is getting to be a habit with me.

BOOK REVIEWS

The Ethics of Collecting Cultural Property: Whose Culture? Whose Property? PHYLLIS MAUCH MESSENGER, editor. University of New Mexico Press, Albuquerque, 1989. xxvi + 266 pp., 28 photographs, appendix, index. \$32.50 (cloth).

Reviewed by Jim D. Feagins, Saint Joseph Museum.

The Ethics of Collecting Cultural Property is a volume that everyone, even remotely interested in archeology, museums, artifacts, ethnology, or social issues should read. Its purpose is to "present a range of perspectives on issues relating to the ownership and preservation of the artifacts of past cultures" (pp. xix). Many sides of this controversial issue are explored. The volume is thought-provoking, forcing us to examine our own thinking on this important subject. An excellent introduction to the subject is given by Brian Fagan in the forward:

The essays in this volume pose fundamental, and sometimes uncomfortable, questions about the past. The questions are myriad, the answers often tough and uncomfortable ones. Who, for example, owns the archeological record? An individual landowner, the descendants of those who created it, the nation, or does it form part of the common cultural heritage of all humankind? Do people have the right to collect artifacts, even from privately owned land, and to excavate for personal profit and gratification? Or should all artifacts be deposited in museums for the common enjoyment of everyone? What about the export of artifacts from one country to another? Should all archeological finds remain in their country of origin, even if there are inadequate museum facilities available there? The proper answers to these, and many other, questions will determine the future of the past. As the essays in this book point out, we are a long way from even slightly definitive solutions to our

ethical problems [pp. xvii].

The Ethics of Collecting Cultural Property was primarily derived from papers presented in 1986 at a conference on the subject at Minneapolis, Minnesota. Two additional papers presented at the Society for American Archeology conference in 1987 at Toronto, Ontario, were also included in this volume. The concern for the loss of cultural resources and the freedom to collect issues were so important that a conference to bring nominal enemies together to seek solutions and explore compromises was enthusiastically supported. This volume makes available, to a wider audience, important background information and the accomplishments of the conference.

This publication is written by 22 contributors from a variety of backgrounds: Canadian museum archeologist, the Zuni Archeology Program, active art dealer, Arkansas archeologist, museum curator, art director, attorney, director of archeology department for the Navajo Nation, state archeologist, Mexican archeologist, art historian, United Nations representative, anthropologist, U.S. Customs Service, director of fine arts museum, Middle American archeologist, National Geographic archeologist, African art specialist, and an ethics and social philosophy professor. A broad horizon of viewpoints on a multitude of related ethics of collecting issues are represented in the volume. While the unevenness of style and writing ability of the different authors is distracting, the resulting overall diversity of the volume's content is a strength rather than a defect.

In addition to the introduction, the publication contains 15 chapters and three commentaries. The volume is divided into four parts: "Perspectives of the 'Victims': Case Studies," "The Cultural Stewardship Question: Looking for Options," "Cultural Property Regulations: Perception and Conditions," and "Working Out Differences: Round Table and Conclusions."

The Ethics of Collecting Cultural Property is

international in scope. The following papers serve as examples of content. "The Battle for the Maya Past: The Effects of International Looting and Collection in Belize" is written by Pendergast and Graham. Many poor people in Belize see looting sites as a way of supplementing their incomes. The dealers, desiring sizeable profits, and the (usually foreign) collectors are all too happy to purchase artifacts. Another writer, Sasson, has empathy with the people of Nepal, who are the victims, whose cultural "treasure" is being stolen. Several authors present an American Indian perspective on the ethics of collecting artifacts and related concepts concerning ancestral sites, shrines, and graves. Ann Early's essay portrays an interesting and graphic description of artifact trafficking closer to home--in the state of Arkansas. She paints interesting profiles of gravediggers, dealers, and financiers (wealthy collectors). Early explains the diggers' strategies, access to sites, excavation techniques, and their rationalization for digging. Some justify their activities by saying they are saving the relics from destruction by nature, agricultural activities, and from other pothunters (they often end up destroying sites which are under no threat except from others like themselves). Some maintain that all one needs to appreciate the Indians are the artifacts themselves. Some diggers say they are doing it just for money. Early correctly maintains that to effectively deal with antiquities trafficking, "The opportunity to destroy sites must be limited, and the public atmosphere that sanctions grave robbing must be changed" (pp. 46). She feels that teaching landowners, obtaining help from avocational archeologists (a stewardship program), public lectures, visiting sites, county fair booths, seminars, training programs, and strengthening antiquities laws, can all help curb artifact trafficking.

The most disappointing part of this excellent publication was the introduction written by Karen Warren and titled, "A Philosophical Perspective on the Ethics and Resolution of Cultural Property Issues." This paper would have been more appropriate in a method and theory section later in the volume. It is hoped that the technical manner in which the introduction is presented will not discourage

readers from exploring the many interesting and informative essays which follow. While many of the thoughtful, well organized ideas that Warren presents are of considerable value, they are inappropriate in style, and to some degree content, for the introduction to this publication. Many individuals who might otherwise profit by gaining a better understanding of the subject and who would enjoy reading the remainder of the publication may be intimidated by this introduction.

The issues in *The Ethics of Collecting Cultural Property* are complex and international in scope. The thought-provoking, diverse perspectives should be of great interest to professional and avocational archeologists, museums, politicians, art dealers, Native Americans, and many other people worldwide. The volume is quite useful for understanding many of the subtle aspects, and not so subtle viewpoints, of the ethics-of-collecting issues. For professional and avocational archeologists, these are not issues that can easily be put aside; they will be debated for years to come. This volume should certainly be of interest to members of the Kansas Anthropological Association, who are concerned with the stewardship of our archeological heritage and related ethical issues. *The Ethics of Collecting Cultural Property* is highly recommended.

* * * * *

Cheyennes and Horse Soldiers; the 1857 Expedition and the Battle of Solomon's Fork. William Y. Chalfant; with a forward by Robert M. Utley. University of Oklahoma Press, Norman, 1989. xxii + 415 pp., 55 figs., appendices. \$24.95 (cloth).

Reviewed by William B. Lees, Kansas State Historical Society.

William Chalfant has written a very interesting account of a 140 day punitive expedition against the Cheyenne that took place during a period when the eastern part of Kansas was immersed in the territorial civil war known as "bleeding Kansas." It is perhaps because of history's focus on this civil war that so little attention has previously been paid to

the Cheyenne expedition. Chalfant's book is thus an important addition to the history of this period. Readers of *The Kansas Anthropologist* will find this book of particular interest because of his usually balanced treatment of the Indian and white perspectives and by his efforts to reconcile the written historical record with the physical evidence provided by a little-changed Western Kansas landscape.

In U.S. military terms, the story is relatively straightforward. Two columns of First Cavalry departed Fort Leavenworth, Kansas, in late May of 1857. A column under Major John Sedgwick followed the Arkansas River to Fort Pueblo (Colorado) and then moved north to join the second column, under Col. Edwin Vose Sumner, along the South Platte River. Sumner's column followed the Platte River to Fort Kearny (Wyoming) and then marched south to the South Platte. The reunited column marched east across the Republican River valley into Kansas Territory and encountered the Cheyenne in the upper reaches of the Solomon River. On July 21, 1857, the U.S. First Cavalry and several hundred Cheyenne warriors battled on the South Fork of the Solomon River in what is today western Kansas. In social and historical terms, the story is much more complex and involves the collision of two cultures made incompatible by 19th century U.S. Indian policy.

Chalfant spends several chapters providing a context within which this campaign can be understood. In his first chapter he develops a broad background to Indian-white relations on the Plains and next, in Chapter 2, he looks at Cheyenne-white relations in the years immediately prior to the 1857 campaign. These chapters illustrate for the reader not only the conflicts between Indian and white culture but also the conflicts within white culture over what was then seen by many as the "Indian problem."

The author's skillful narrative of the expedition begins with Chapter 3. Throughout this detailed account there is a carefully crafted balance of the Indian and cavalry perceptions of the campaign. The reader is made to see the event from both sides. While more space

is given in recounting the cavalry side of the story, this is certainly because of the greater availability of primary documents. Differential availability of documents also had an effect, however, on the cavalry narrative. The daily journal of Eli Long was a key source of information and as a result the narrative of Sedgwick's column, to which Long was attached, is substantially more detailed than is that for Sumner's column. No matter, the daily writings of Long add a type of detail and insight that is rarely available in accounts of this type, and which is very welcome.

Chalfant's balanced, first-hand approach is notable and skillfully done, but to some may be a source of criticism. The book is clearly a blend of fact and conjecture; in a narrative of this scope there are clearly gaps in the Indian and soldier story that had to be bridged. This is certainly more common in the narrative of the Cheyenne, but was without doubt a major factor for the two columns of First Cavalry as well. That it is at times difficult to determine what is conjecture and what is not is unfortunate. This is, however, a price paid for a narrative that carries the reader easily through the pages of the book and, from my perspective, an appropriate balance has been struck.

An important strength of this book results from the author's first-hand knowledge of the geography and topography of his subject. Chalfant writes with a keen knowledge of the landscape, and he uses geography and landscape as historical information. The excellent maps that help illustrate this work are an obvious outgrowth of substantial field research and truthing. The resultant geographic familiarity has also worked its way into text to which the excellent descriptions of various settings attest. Other historians would do well to follow Chalfant's lead and become as comfortable with the landscape as with the written word.

Not to be overlooked are four appendices. The first two appendices are notable in that they provide a narrative background to the Cheyenne, in Appendix A, and the First Cavalry, in Appendix B. These are intended to allow the unacquainted reader to become

familiar with the subjects of this book and are conveniently out of the way for those who already possess a working knowledge of these groups.

Although usually serving him well, Chalfant's literary style is not without problem. I wish, for example, he had not written: "The war cries of the Indian were building to a crescendo, and the *barbaric splendor* of their line was becoming clearly visible to the troops" (pp. 189-192, italics added). Barbaric is not a useful term in a book that seems to try to recognize 1850s Cheyenne

culture as a viable culture and fully respectable way of life. For a moment, Chalfant seems to have slipped into the antagonistic culture of the U.S. War Department of the mid-19th century.

Semantic sharp-shooting aside, however, I believe both the casual reader and serious scholar will appreciate *Cheyennes and Horse Soldiers* as a generally delightful book that comments strongly on Indian-white relations and on a particular event of history. Chalfant has done an admirable job and I recommend this book without reservation.

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