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BAYOU GULCH (5DA265) CERAMICS

by

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ABSTRACT

Archaeological excavations conducted at the Bayou Gulch site in 1979 by the Colorado Department of Highways Archaeological Unit revealed a prehistoric, intermittently occupied, open campsite. The site is located in the Plains-Foothills transition zone at the confluence of Cherry and Bayou creeks (south of Denver) on the extreme western perimeter of the Central Plains culture subarea.

Before sherd locations were pinpointed stratigraphically, there was an attribute analysis of the pottery, with sherds arranged into categories on the basis of wall thickness and cord impressions. The resulting groups included thin-walled, clearly and finely cordmarked pottery, and thick-walled, coarsly cordmarked ceramics with obliterated varieties. The sherds were compared with whole and partial vessels from documented sites in Colorado, Kansas, Nebraska, and Wyoming in order to determine the relationship of the Bayou Gulch ceramics to recognized Plains pottery types. Finally, the sherd types were considered in the context of their exact stratigraphic positions and relationship to features and radiocarbon ages. These comparative analyses clarified the chronological positioning of the pottery. The results of this study suggest that the ceramic remains from Bayou Gulch are affiliated with the terminal Plains Woodland, radiocarbon dated between A.D. 900 and 1100.

INTRODUCTION

Pottery manufacture reached the inhabitants of the western High Plains at the beginning of the Christian era (Wood 1967:594). Sears (1948:122) and Willey (1966:267) have defined the transition from the Archaic to the Woodland cultural tradition by the appearance of cordmarked pottery in the latter. Archaeological manifestations in the western Plains exhibiting this early ceramic development have been called "Woodland" in recognition of similarities with Middle Woodland period components in the Missouri River area, which in turn are closely related to the cultural history of the eastern Woodlands (Willey 1966:311).

The basic temporal trend observed in Plains ceramics involves the replacement of earlier, cord-roughened vessels with smoothed-surface or thong-wrapped, paddle-marked types (Wedel 1961:168-182). The stratigraphically earlier vessels had elongated bodies, conoidal bases, and direct or slightly

incurving rims. These then gave way to more globular bodies, rounded bases, and rims that were thickened, collared, and often decoratively incised. Finally, later pottery vessels tended to be more globular and more often smooth bodied, and bore handles, lugs, or other appendages (Willey 1966:321).

Wood (1967) defines the Early, Middle, and Late Ceramic periods on the basis of these trends. The corresponding cultures are the Woodland, Upper Republican, and Dismal River manifestations. The terminology employed in this paper includes Woodland, Early Plains Village, and Middle and Late Plains Village, first described and used by Lehmer (1954:139) and discussed further by Wedel (1978:207-213). Radiocarbon dating techniques have yielded dates for Woodland sites which range from A.D. 150 to 1050 (Johnson 1976:2) and A.D. 300 to 1100 (Wood 1972:12). For the Early Plains Village period, dates fall roughly between A.D. 1100 and 1450 and are represented by Upper Republican in Colorado, Kansas, and Nebraska; Middle Plains Village dats fall between A.D. 1450 and 1750. The most significant dates for the Late Plains Village period start around A.D. 1750 and extend into the mid-nineteenth century (Baugh 1984:68). Wedel (1978:207-213) begins the Plains Village period at A.D. 900.

One goal of this paper is to define more clearly the pottery types found within eastern Colorado, and to relate them to other archaeological complexes from better known areas. Specifically, the relationship of the Bayou Gulch (5DA265) ceramics to Woodland wares in the Valley and Keith foci of Nebraska, Kansas, and Colorado is explored. The pottery from Bayou Gulch may demonstrate either terminal Woodland or transitional Woodland-Upper Republican affiliations. Radiocarbon ages from Bayou Gulch help to solidify the chronological basis of these interpretations.

THE BAYOU GULCH SITE

The Bayou Gulch site (5DA265), located in Douglas County, Colorado, is situated on the extreme western perimeter of the Central Plains culture area (Figs. 1 and 2). It was excavated in 1979 under the supervision of John D. Gooding. The site is located on a low terrace above the floodplain at the confluence of Cherry and Bayou creeks. It appears to

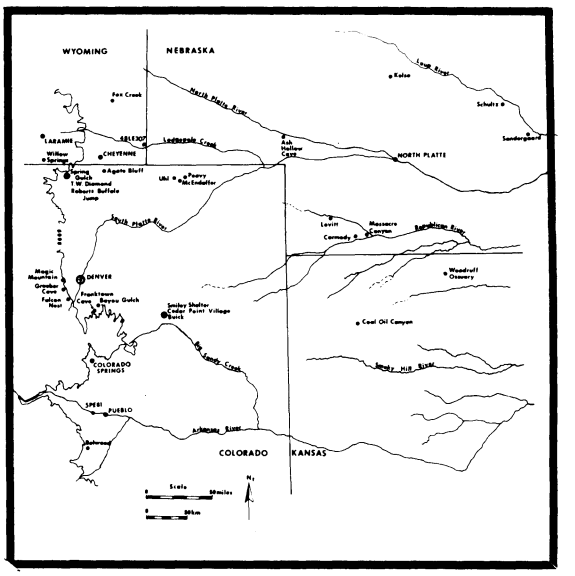

Fig. 1. Location of ceramic sites discussed.

have been an intermittently occupied, open campsite extending approximately 200 m north and south along the terrace.

Excavation strategies included removal of soil from 1-m^2 units by trowel and shovel. Excavated material was screened through ¼-inch hardware cloth. Soil was removed initially in arbitrary 10-cm levels until such time as cultural horizons could be detected.

There is considerable stratigraphic variability across the site. Exposed areas, particularly evident in the southern portion of the site, have been severely deflated. This deflation has resulted in some compression of the cultural deposits. Certain occupations were very shallow in the deflated areas, while in the well-developed soils, these occupations were 50 to 60 cm in depth. The soils of the northern portion of the site were well developed enough to allow for the building of the chronological sequence for the entire site (Grant 1979).

RESEARCH DESIGN AND ANALYTICAL METHODS

The sample of sherds from Bayou Gulch totals nearly 600: 253 body sherds, 34 rim sherds, and 251 sherds that are too small or too eroded for analysis and are not considered in further tabulations. The entire sample is included in the pottery distribution

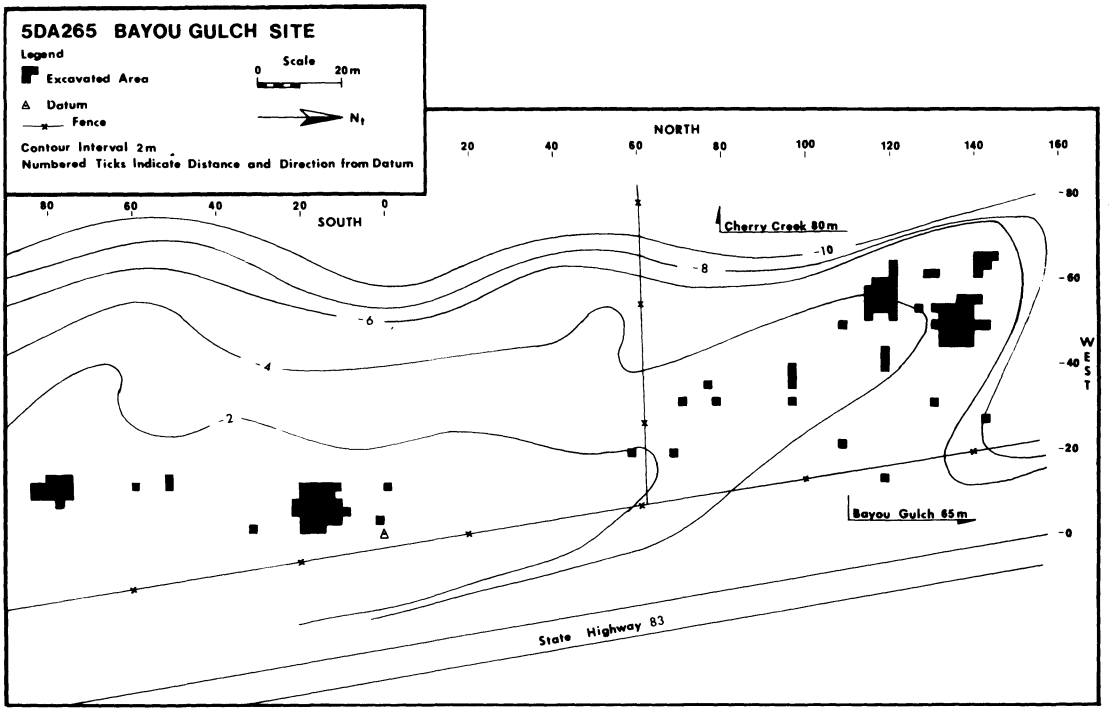

Fig. 2. Bayou Gulch (5DA265) site map.

map of the site presented later in this paper. Because of the fragmented nature of the material recovered, whole vessels could not be identified. All sherds that could be conjoined were glued and considered as one sherd. The descriptions generated employ attribute categories and terminology suggested by Gifford (1952) and Wheeler (1952). Criteria for wares and types follow those of Lehmer (1954:41) and Wheat et al. (1958).

Plains pottery is difficult to classify since limited ceramic material is obtained from most sites, providing little basis for comparison or description. Additionally, what little pottery is found appears to be homogeneous within each cultural unit. Despite criticism directed toward typologies and particularly toward the taxonomic system of classification (Brew 1946; Ford 1954; Spaulding 1953), there is a need for refined chronological ordering and the systematic descriptions of pottery types in the western Plains (Butler 1980; Ellwood 1975; Wood 1971). Therefore, several broad issues must be addressed. These include determination of the applicability of the taxon and content of the Plains Woodland lifeways to Colorado and the actual nature of the Colorado Woodland. Are there two major cultural areas in the eastern half of the state, or does this area simply comprise an extension of the Central Plains manifestation? In order to address such questions, firm chronologies must be established and systematic taxonomies developed that are useful for discussing the dynamics of eastern Colorado prehistory (Butler 1980).

A data base generated through adherence to rigorous scientific methods is fundamental to the investigation of these issues. Analysis of the Bayou Gulch ceramics is based on the assignment of sherds to categories defined by attributes or attribute classes (Table 1) independent of intrasite context, provenience, or dating information. The latter data were applied only after preliminary identifications were made.

If a temporal range for a particular type can be derived by means of an absolute dating technique such as radiocarbon dating, all the sherds belonging to that one type are considered contemporary. In the development of time-space culture histories, the value of the type increases in direct proportion to the frequency of its association with radiocar-

Table 1. Sherd attributes.

Pottery Types										
	Type Ia		Type Ib		Type II		Type IIIa		Type IIIb	
Attribute	N	%	N	%	N	%	N	%	N	%
Firing Methods										
Oxidizing Atmosphere	43	81	9	22	5	38	35	73	6	18
Non-oxidizing Atmosphere	8	15	32	78	8	62	13	27	28	82
Paste-Temper										
Quartz: Angular	20	38	24	59	10	77	25	52	11	32
Subangular to Subrounded	33	62	17	41	3	23	23	48	23	68
Feldspar	7	13	2	0.1	7	54	15	31	13	38
Other*	18	34	8	19	0	0	52	75	24	70
Carbon Streak										
Present	41	77	31	76	9	69	33	69	29	85
Absent	12	23	10	24	4	31	15	31	5	15
Paste Texture										
Fine	20	38	9	22	3	23	1	2	2	6
Medium	21	40	16	39	4	31	13	27	10	29
Coarse	12	22	16	39	6	46	34	71	22	65
Paste Color										
Dark Gray (7.5YR 4/0)	11	21	10	25	8	62	18	37	24	71
Light Brown (7.5YR 6/4)	10	19	12	29	3	23	22	46	3	9
Pinkish (7.5YR 6/2)	32	60	19	46	2	15	8	17	7	20
Surface Finish/Cordmarks										
Nature: Parallel	40	75	3	7	0	0	41	85	32	94
Irregular	13	25	38	93	0	0	7	15	2	6
Frequency per cm: 2-3	22	42	21	51	0	0	44	92	31	91
4-5	31	58	20	49	0	0	4	8	3	9
Depth										
Shallow (0.0-0.49 mm)	11	21	20	49	0	0	43	89	28	82
Medium (0.50-0.99)	24	45	17	41	0	0	5	11	6	18
Deep (1.0-1.49 mm)	18	34	4	10	0	0	0	0	0	0
Form										
Body Sherds	46	87	35	85	6	46	42	87	33	97
Wall Thickness:										
Thin (2-4.9 mm)	26	49	5	12	4	31	0	0	0	0
Medium (5-7.9 mm)	27	51	26	63	8	61	16	34	10	31
Thick 8-10.9 mm)	0	0	10	25	1	8	32	66	24	69
Rim Sherds	7	13	6	15	7	54	6	13	1	3
Total	53	100	41	100	13	100	48	100	34	100

*Crushed rock, muscovite, hematite, hornblende and/or unidentified ferrous magnesium mineral.

bon ages of the same period and archaeological context.

Although there are numerous descriptions of Woodland pottery, few serious attempts have been made to isolate or identify types for the western perimeter of the Central Plains culture area. This study was undertaken in order to establish such a chronological succession for the Bayou Gulch site and to discern whether a valid regional type exists. Accurate identification and classification are central to archaeological research. The results of these processes affect subsequent inferences and interpretations. Further research can be based on systematic typologies and accurate, precise chronologies.

The modification of the Midwestern Taxonomic System (focus, aspect, and phase [McKern 1939]) that has served as the principal classification framework in Plains archaeology has not been altogether satisfactory. Consequently, Lehmer and Caldwell

(1966:510) proposed a modification of Willey and Phillips's (1958) archaeological unit concept, and Krause (1969:82-96) later applied these unit concepts. This taxonomic headache has not yet been fully resolved in the literature concerning the western High Plains. In this paper, however, "phase" is preferred to "focus," with the assumption that spatial and temporal limits and developmental relationships are implied in the original definition of "phase" (Wood 1967:568-569).

One of the first attempts to define valid cultural units for the prehistoric occupations of the Central High Plains in eastern Colorado is Withers's (1954) synopsis. He defined two foci (phases) of the late Woodland period in the Middle West and one focus (phase) of Upper Republican phase. Typologies need not be constructed only to indicate geographic separation if that is the primary factor of differentiation. It may be that there is a ceramic manifestation of the foothills pottery that is different from Central Plains Woodland. The Bayou Gulch ceramic analysis considers this dilemma.

Several characteristics of the sample place limitations on the analysis. First, there are no complete vessels, and very few sherds are large enough to indicate possible vessel form. Additionally, there is a remarkable consistency in the collection. This lackluster, nondescript quality, subject to little variation, makes it difficult to distinguish or to interpret cultural levels.

Consistency in quality makes a detailed examination essential. Along with efforts to be objective, analysis of this material must also be based on a process of subjective saturation (Jennings 1949; Krieger 1949; Shepard 1968:96-100). The pottery type is useful in comparative analysis of cultures, so it is generally better to err on the side of overrefinement in segregating collections into types (Jennings 1968). The final concern, however, is not in typology per se but in cultural interpretation. Thus, pottery typing is no more than a tool for a better understanding of cultural phenomena. It gives one a name to use, rather than an extended description, in any interpretive discussion.

The detailed study of pottery, combined with associated radiocarbon ages and projectile point forms, can become the key to questions concerning the cultural history of Colorado; however, the relationship between the pottery and the radiocarbon ages from the site limits the analysis. At Bayou Gulch, the radiocarbon ages cluster around 1660 ± 55 to 1350 ± 65 years B.P., and again around 1050 ± 55 to 800 ± 50 years B.P. (Table 2). The first cluster of dates may be associated with a Woodland occupation because of the presence of thick, cordmarked pottery, or, since the first group of dates is aceramic, the 1050 to 800 years B.P. cluster may represent terminal Woodland or Early Plains Village-Upper Republican at Bayou Gulch.

In spite of such limitations, these data will add to Plains culture history, especially because of the number of radiocarbon ages and pottery descriptions. Should this analysis prove to be only partially successful in its attempt to clarify the chronological relationship of local cultures within the broader categories, such an attempt will make a significant contribution to eastern Colorado prehistory.

BAYOU GULCH CERAMIC TYPES

Plains brownwares are similar to Pueblo corrugated pottery in that paste and firing characteristics are less consistent than for most painted types of the Southwest. Uniform standards were not of particular concern to the potters (Gifford and Smith 1978:45). The most probable source area for the Bayou Gulch ceramic tempers and clays is along the Front Range. The arkosic lithology and generally angular morphology of tempers are confined to the mountains.

In varying amounts, temper clasts in the Bayou Gulch sherds include quartz, feldspar (including microcline), muscovite, hornblende, various ferromagnesian minerals, and some hematite. Temper is generally coarse grained, angular to subangular quartz sand, with only a few rounded grains. The angularity and lithology of the temper indicate that the particles were not transported great distances before being deposited. Although some sherds contain more feldspar, on the verge of arkosic sand, and others contain a relatively high percentage of quartz, there is nothing in the Bayou Gulch pottery assemblage that could not have been manufactured from local clays and tempering material. The paste or clay sources appear to be the same throughout the sample. A single rock outcrop could have produced all the different lithol-

Table 2. Radiocarbon Dates from Bayou Gulch (5DA265).

Feature No.	Lab No.*	Age B.P.	Age A.D.	Calibrated Dates** Range	Calibrated Dates** Midpoint	
7	DIC-1506	60 ± 55	1890 ± 55	1670-1935 1670-1730 1795-1935	1802.5 1700 1865	Wood charcoal
33	DIC-1703	510 ± 85	1440 ± 85	1335-1435 1295-1505	1385 1400	Charcoal and peat
21	DIC-1702	640 ± 65	1310 ± 65	1255-1405 1235-1415	1330 1325	Wood charcoal
20	DIC-1503	800 ± 50	1150 ± 50	1160-1295	1227.5	Wood charcoal
19	DIC-1701	850 ± 50	1100 ± 50	1045-1260	1152.5	Charcoal and peat
12	DIC-1507	870 ± 55	1080 ± 55	1035-1255	1145	Wood charcoal
19a	DIC-1700	940 ± 50	1010 ± 50	920-1230	1075	Charcoal and peat
3	DIC-1440	950 ± 60	1000 ± 60	915-1225	1070	Contents of fire basin
1	DIC-1438	1050 ± 55	900 ± 55	875-1055	965	Soil with organiclike matrix
18	DIC-1505	1350 ± 65	600 ± 65	585- 785	685	Wood charcoal
18a	DIC-1502	1440 ± 55	510 ± 55	450- 650	550	Wood charcoal
10	DIC-1504	1520 ± 50	430 ± 50	400- 610	505	Wood charcoal
5	DIC-1469	1660 ± 55	270 ± 55	225- 565	395	Charocal
14	DIC-1508	3410 ± 70	-1460 ± 70***	-1905-1635 -1975-1545	-1770*** -1760	Wood charcoal

* Dicarb Radioisotope Laboratories, Gainesville, Florida.
** Calibrated dates based on Klein et al. (1982).
*** B.C. dates are represented by negative values.

ogies noted in the pottery. The clay beds in the Denver/Dawson formations are so numerous as to make further analysis, such as tracing exact sources, impractical.

At Bayou Gulch the color of the sherds ranges from pinkish gray (7.5YR 6/2) to dark gray (7.5YR 4/0). The color of a fired clay is determined largely by its iron content since all iron compounds are transferred to red oxide (hematite in this case) if fired in an oxidizing atmosphere. The color variation depends upon a number of factors, including amount and condition of the iron and the firing temperature and subsequent use. The dark sherds are the result of the above variable in addition to organic content. The latter may consist of carbonaceous material in the clay left unburned in the original firing or accrued in subsequent firings. Black pottery in the Southwest is usually not only low fired but also smothered so as to impart carbonaceous material into the fabric itself in the final stages of firing (Shepard 1968:88-89). Although color is not a dependable attribute for differentiating types, the carbonaceous qualities of the sherds and the distribution of these characteristics across the site are interesting.

The general nature of firing and mineral content can be assessed by examining the sherd core at a fresh break. While there are differences between vessels constructed within the area, one would expect homogeneity within a single pot, since a potter ordinarily wedges or mixes the clay before starting to construct a vessel. The above variables account in part for the heavy dependence in this analysis on surface finishing techniques.

The inadequacy of verbal descriptions of pottery is generally recognized (Shepard 1968:97). The Bayou Gulch sample consists

of fragmentary sherds not large enough to indicate vessel shape. As a result, documented complete vessels from other collections were examined and measured. Familiarity with whole vessels helped to bring the material into focus (Ellwood 1978). Though the sample of whole vessels was nonrandom and did not provide a complete cross section of evidence, firsthand observation did provide a firmer basis for comparison. Strictly speaking, however, analysis is not a matter of matching but of describing what one observes. Therefore, analytical descriptions of the Bayou Gulch types are presented below.

Three general types emerged from 189 of the analyzable sherds recovered from Bayou Gulch. These were given arbitrary numbers (Types I, II, and III) until their stratigraphic positions were determined. Characteristics considered to be most definitive in the descriptions of these types are form, paste, temper, texture, and surface finish (including nature, depth, and frequency per centimeter of surface marks). A fourth category, Type V, includes those sherds having only a single intact surface or none at all due to erosion or deterioration.

Type Ia, Cord-Impressed

Number of Sherds: Forty-six body sherds and seven rim sherds comprise this type (Fig. 3). No vessels were reconstructable.

Method of Construction: There is direct visual evidence that vessels were constructed by the slab-patch method, modeling and accretion, and that thinning was accomplished by cord-wrapped paddling of exteriors, with fingers acting as stabilizers or anvils inside the vessel.

Method of Firing: The majority of the sherds were fired in an oxidizing atmosphere.

Paste: The paste is brown firing clay. It is more compact than friable but has a slightly granular appearance.

Temper: There is less than 10% temper visible in the walls. Temper is comprised of subangular to subrounded quartz particles. Most are coarse sand 1 to 1.5 mm in diameter according to the Wentworth classification (Shepard 1968:118). The thinness of the sherds emphasizes the coarseness. There are also some finer quartz particles, a small amount of weathered feldspar, and minute quantities of hematite, muscovite, and hornblende. A somewhat bimodal (fine/coarse) size distribution results.

Carbon Streak: Carbon streak (7.5YR 4/0) is visible when a sherd is viewed in cross section at a fresh break. This attribute appears in more than half of the sherds and it usually covers more than two-thirds of the interior.

Texture: The texture of the core is fine to medium-coarse, and the freshly broken surfaces are irregular.

Color: The color of the paste is light brown to dark gray (7.5YR 6/4-4/0). Sixty percent (32) of the sherds were pinkish gray to brown (7.5YR 6/2-5/2) on the exterior.

Surface Finish: The exteriors of the sherds in this type are clearly cord-impressed.

Nature of the Surface Marks: The marks are parallel; any irregularities are very minor. The cord marks are fine to medium-fine and lie parallel to one another. Impressions of individual cords are visible in some sherds where they are oriented perpendicular to the rim.

Frequency of Surface Marks: Fifty-eight percent (31) of the sherds exhibit four to five cord marks per centimeter, with two to three per centimeter evident in the remainder.

Depth of Marks: Marks range from shallow to deep. About 50% of the marks are medium in depth (0.50 to 0.99 mm).

Interior: There are no obvious wiping marks. The interior was probably hand smoothed.

Form: The body sherds are too small to give an indication of vessel shapes and sizes. It is assumed that the lack of definite curvature indicates that shoulders were probably lacking and that vessels were probably conoidal in shape.

Wall Thickness: Sherds range from 4.0 to 7.9 mm in thickness. Average thickness is 6 mm.

Rims: In general, six of the seven cord-marked rim sherds are rounded or slightly

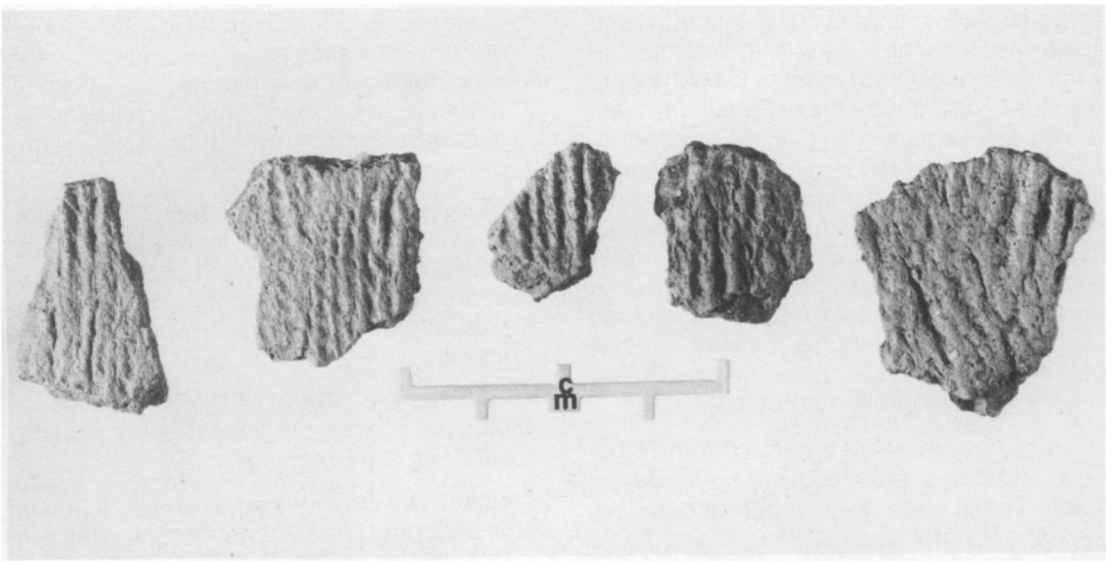

Fig. 3. Sample of Type Ia, Cord-Impressed.

flattened with shallow cord impressions terminating just short of the lip. The seventh rim sherd has fine rim markings that run up to and across the rim. The rims that are flattened have just a suggestion of an overhang.

Rim Profiles: See Figure 4. Of the seven rim sherds, six have a slight overlap. The overlap on these sherds suggests that the potter was not intentionally trying to thicken the rim but was merely putting on a finishing touch.

Condition: Sherds are heavily eroded. This may be due partly to weathering at an open site and partly to the granular nature of the paste. There is no sooting or carbon encrustation on the sherds.

Distribution: Horizon Aa—10 (including one rim sherd); Horizon A_1 — 23 (including four rim sherds); Contact A_1/A_2 — 4; Horizon A_2 — 16 (including two rim sherds).

Comments: Identifying attributes of Type Ia are the thinness of walls and the clear, relatively deep cord marks. Analysis of the pastes of this type indicates that they are medium-fine to medium-coarse and contain a low percentage of clear subangular to subrounded quartz grains. Surface color is predominantly pinkish gray (7.5YR 6/2), while surface interiors range in color from light brown to dark gray. The color in these sherds is due in part to the presence of hematite, both as stain in the clay and as stain on the quartz grains.

Type Ib, Cord-Roughened Variety

Number of Sherds: There are 35 body sherds and six rim sherds in this type (Fig. 5).
Method of Construction: Vessels were constructed by the patch or accretion method. Walls were thinned by paddling, with the hand acting as an anvil.

Method of Firing: Variable fired clay colors indicate a lack of firing control. Most of the sherds are either not oxidized on both sides or are only partially oxidized during the firing.
Paste: The paste of Type Ib sherds is similar to that of Type Ia.

Temper: The temper tends to be somewhat more angular than that of Type Ia and exhibits a distinctly bimodal size range. Both fine and coarse sand fraction occur. It is possible that the fine fraction was associated with the clay and that the coarse fraction was added as temper. Approximately 5% to 10% of the sherd walls are composed of temper.

Carbon Streak: Over 50% (21) of the sherds show differential or incomplete fir-

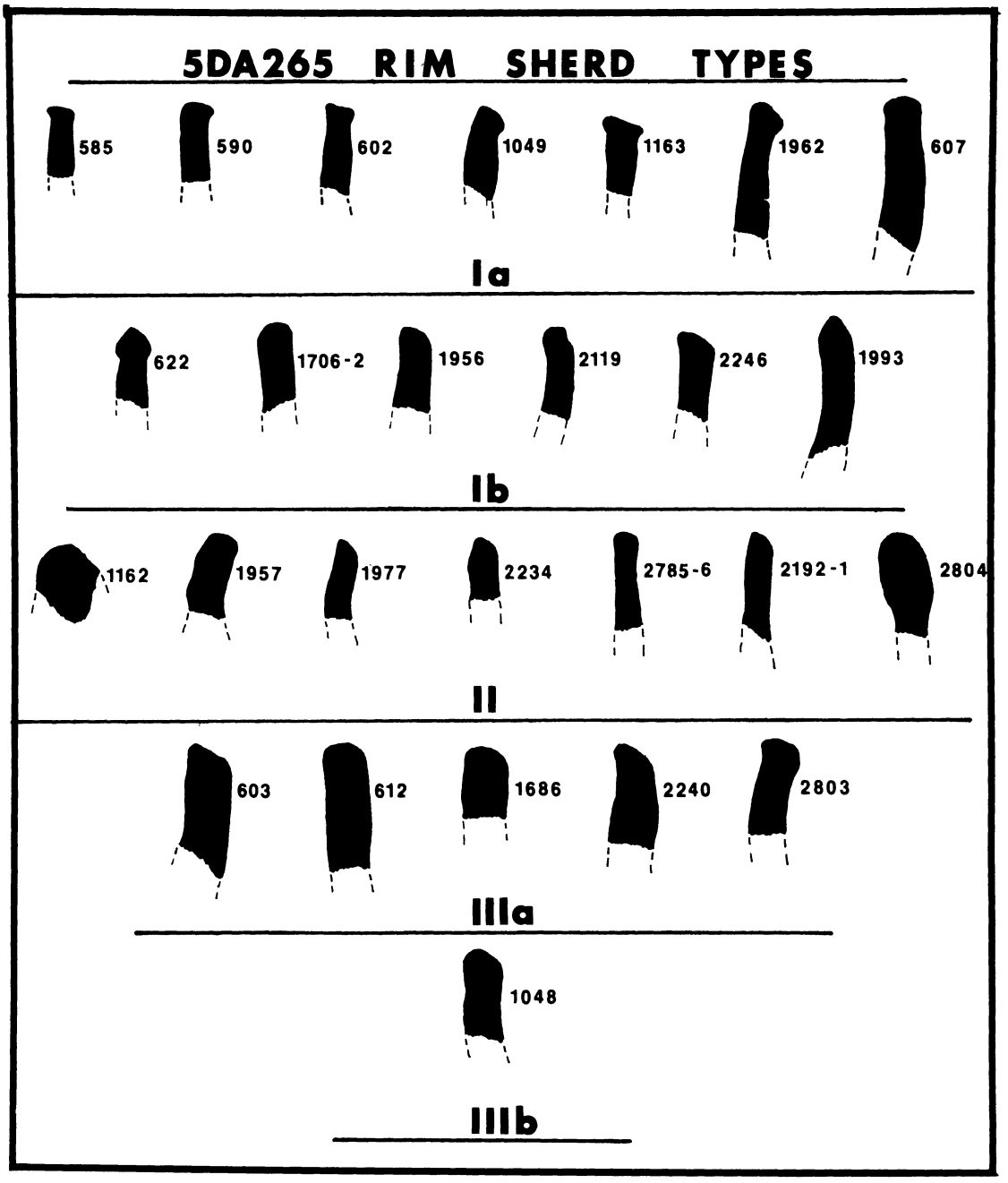

Fig. 4. Bayou Gulch rim profiles by type.

ing. Profile views reveal a dark brown-gray central strip.

Texture: The texture is medium-fine.

Color: Although some dark gray (7.5YR 7/2) and light brown (7.5YR 6/4) sherds were identified, the majority are pinkish gray (7.5YR 6/2).

Surface Finish: Sherds of Type Ib are either cord-roughened or brush-impressed on the exterior.

Nature of Surface Marks: Although the cord marks lie parallel to one another, the impressions are short or choppy. These marks could not have been produced by

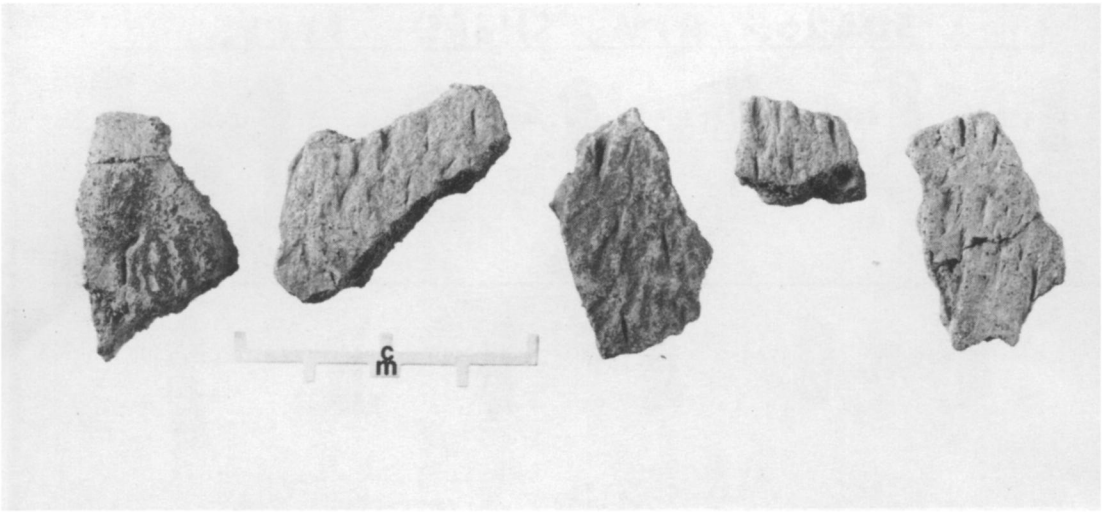

Fig. 5. Sample of Type Ib, Cord-Roughened Variety.

overlapping paddle impressions, though the surface firing technique employed was not identified. The clay was very soft when the impressions were made, and the impressions are no longer clear.

Frequency of Surface Marks: More than half of the sherds exhibit between two and three cord marks per centimeter.

Depth of Surface Marks: The marks are slightly shallower than those in Type Ia.

Interior: The interior surface is smoothed, probably by bare hand.

Form: Although sherds are too fragmented to draw positive conclusions, the absence of shoulders and minimal curvature suggests that the sherds represent conoidal or sloping jars.

Wall Thickness: More than half of the sherds measure between 5 and 7.9 mm.

Rims: Rims are direct and rounded.

Rim Profiles: See Figure 4. Of the six rim sherds, three are rounded and paddled on each side to bring the lip to a slight peak.

Condition: Sherds are heavily eroded as with Type Ia.

Distribution: Horizon Aa — 7 (including two rim sherds); Horizon A_1 — 20 (including three rim sherds); Contact A_1/A_2 — 3; Horizon A_2 — 11 (including one rim sherd).

Comments: Diagnostic attributes of Type Ib are the thickness of walls accompanied by relatively clear and deep cord marks. An additional unidentifiable set of marks consists of short, choppy impressions which may or may not be brush marks. Paste and color are similar to Type Ia.

Type II, Plainware

Number of Sherds: There are six body sheds and seven rim sherds in this type (Fig. 6).

Method of Construction: There is no direct evidence of manufacture except that one sherd, 2143 (16 x 22 mm), exhibits two junctures in profile which could be cord marks or are indicative of slab construction.

Method of Firing: Three body sherds and five rim sherds are dark gray-brown (7.5YR 3/1) and appear to have been fired in a non-oxidizing atmosphere. There is no evidence of sooting. Three body sherds and two rim sherds are partially oxidized. It is impossible to ascertain if this is the result of initial differential firing or of subsequent burning.

Paste: The paste is fine.

Temper: Nonplastic inclusions exhibit a unimodal size range and consist of an even, abundant mixture of medium and coarse, clear and milky quartz sand. It is angular to subangular in form. Coarse

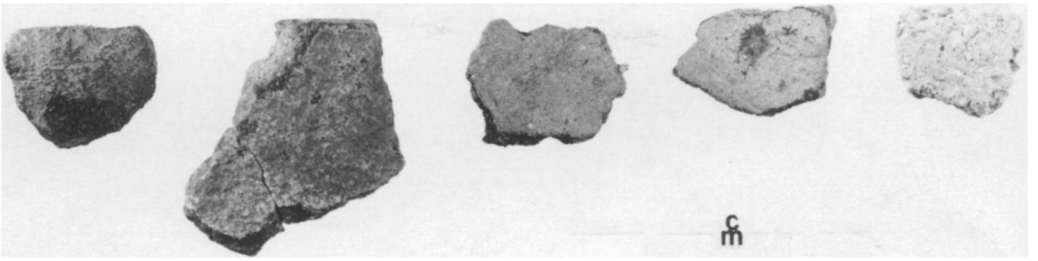

Fig. 6. Sample of Type II, Plainware.

reddish pink, arkosic grains are also fairly abundant. Approximately 7% of sherd walls are composed of temper.

Carbon Streak: A carbon streak is visible in three body and six rim sherds, which again indicates incompleteness or lack of control in firing.

Texture: The texture of the paste is coarse and friable, and the fracture is irregular.
Color: Paste color ranges from dark gray (7.5YR 4/0) to pinkish gray (7.5YR 6/2).

Surface Finish: Two of the rim sherds exhibit horizontal wiping striations on interior and exterior surfaces. Other surfaces are plain and lack slips and polish.

Form: One sherd, 2143, shows a seam of patching but little curvature. Three sherds demonstrate considerable rounding, however, and they may be part of a small pot or miniature.

Wall Thickness: More than half of the sherds (8) are of medium thickness (5-7.9 mm), with an average thickness of 5.5 mm.

Rims: Of the seven rim sherds, five are rounded, one is flattened, and one, 2804, is thickened (see Fig. 4, Row 3).
Rim Profiles: See Figure 4.

Condition: Sherds of this type are eroded and laminated.
Distribution: Horizon Aa — 2 (including one rim sherd); Horizon A_1 — 5 (including three rim sherds); Contact A_1/A_2 — 3 (including one rim sherd); Horizon A_2 — 3 (including two rim sherds).

Comments: This group of sherds resembles a category more than a type. The common element is a plain surface. The high density of aplastics (including both quartz and feldspar) in the paste constitutes a second identifying attribute. Surface color varies from light tan to dark gray. This small sample shows the most internal variability of sherd groups considered in this study. The variability in color may be a function of differential initial firing and variation in paste mineralogy. There is a disproportionate number of rim sherds relative to body sherds. Plain rims may, in fact, derive from smaller cordmarked pots with wiped rims as well as from vessels possessing simple smoothed/wiped surfaces.

Type IIIa, Obliterated Cordmarked

Number of Sherds: There are 42 body sherds and six rim sherds in this group (Fig. 7). It was not possible to reconstruct any whole vessels.

Method of Construction: Manufacturing techniques consisted of lump or slab modeling and accretion. Vessel walls were shaped by paddling, with the hand or fingers acting as anvils on the interior surface of the vessel.

Method of Firing: Most sherds show evidence of exposure to oxygen during firing on one surface or the other.

Paste: The brown firing paste is granular in appearance and slightly friable.

Temper: Aplastics comprise up to 30% of sherd walls and consist of medium-coarse to coarse, angular and subangular,

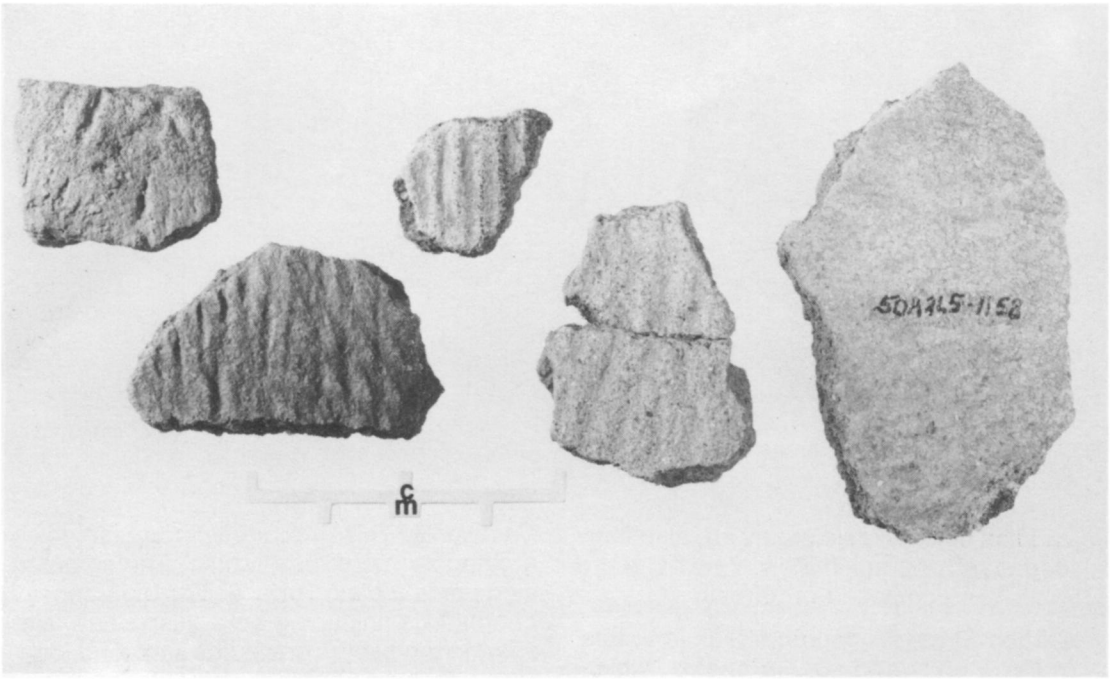

Fig. 7. Sample of Type IIIa, Obliterated Cordmarked.

weathered feldspar. A dark, unidentified ferromagnesium mineral and occasional particles of muscovite, hematite, and rock fragments were also observed in the heterogeneous temper. Temper is unimodal in size and follows a continuum from medium-coarse through coarse. It tapers off in the very coarse area.

Texture: Paste texture is coarse, granular, and somewhat blocky.

Color: Paste color ranges from buff to gray brown (7.5YR 3/0-3/2), with a small percentage of sherds in the pinkish gray range (7.5YR 6/2).

Surface Finish: The exterior sherd surfaces exhibit partially obliterated paddle worked or stamped impressions.

Nature of Surface Markings: The impressions are generally parallel but tend to be undulating and of variable to wide patterning. None show clear cord marks.

Frequency of Surface Markings: Ninety-two percent (44) of the Type IIIa sherds possess two to three marks per centimeter.

Depth of Markings: Eighty-nine percent (43) of the sherds exhibit shallow impressions (0-0.49 mm), and the remainder are moderately shallow (0.5-0.99 mm).

Form: Most of the largest sherds in the total assemblage were of this type. Sherd 1403 measures 8 x 7 cm, and sherd 2828 measures 9 x 6 cm.

Wall Thickness: Sherds of Type IIIa are generally thick. Sixty-six percent (32) of the sherds measure between 8 and 10.9 mm in thickness, while the other 34% (16) are 5 to 7.9 mm thick. Average thickness is 8.8 mm.

Rims: There are six rim sherds of Type IIIa in the Bayou Gulch sample. They average 7.7 mm in thickness. Cord marks are irregular but parallel and perpendicular to the rim.

Rim Profiles: See Figure 4.

Condition: The sherds are badly eroded, which may partially account for the lack of clarity and the shallowness of the markings.

Distribution: Horizon Aa — 9 (including one rim sherd); Horizon A_1 — 22 (including three rim sherds); Contact A_1/A_2 — 12 (including two rim sherds); Horizon A_2 — 5.

Comments: Identifying attributes of Type IIIa sherds include thick walls and shallow, partially obliterated exterior surface impressions. The markings on this type of pottery are parallel but widely spaced and slightly uneven or undulating. Although there is some overlap, there are fewer marks per centimeter in Type IIIa than in Type Ia, and they may represent thong-wrapped paddle impressions. No sherds show clear cord markings. Pastes are coarse to medium-coarse, are friable, and fracture irregularly. Aplastics include a high percentage of medium-coarse, angular and subangular, clear quartz particles as well as moderate quantities of weathered feldspar, an unidentified ferromagnesium mineral, and flecks of light-colored petrified wood. Surface color is predominantly light brown (7.5YR 6/4) to pinkish gray (7.5YR 6/2) and is similar to that of Type Ia.

Type IIIb, Obliterated Cord-Roughened Variety

Number of Sherds: Thirty-three body sherds and one rim are in this group (Fig. 8). No vessels were reconstructable.

Method of Construction: There is direct visual evidence that vessels were constructed by the slab-patch method, modeling and accretion. Walls were shaped by repeatedly striking the damp clay surface with a cord-wrapped paddle to produce uneven or overlapping impressions. Consequently, initial impressions are not distinguishable. Hand and fingers acted as an anvil inside the vessel.

Method of Firing: In most cases, firing was uneven, incomplete, and indicative of a non-oxidizing atmosphere.

Paste: The brown paste contains a large amount of carbonaceous material.

Temper: Temper is relatively sparse and is estimated at less than 10% density. It consists of angular and subangular clear quartz with lesser amounts of arkosic material. The sherds with larger percentages of feldspar tend also to contain more muscovite, though this characteristic may be attributed to the quality of the clay rather than the intention of the potter. Temper size exhibits a continuous or bell-shaped distribution from fine to coarse.

Carbon Streak: A carbon streak is present in over 80% (29) of the sherds. Seventy-five percent (22) are carbonaceous throughout the entire sherd core.

Texture: The paste is coarse, almost porous, but fairly homogenous.

Color: Paste color is dark gray (7.5YR 4/0), but a few sherds exhibit a light brown exterior (7.5YR 6/4). This is an indication of uneven firing.

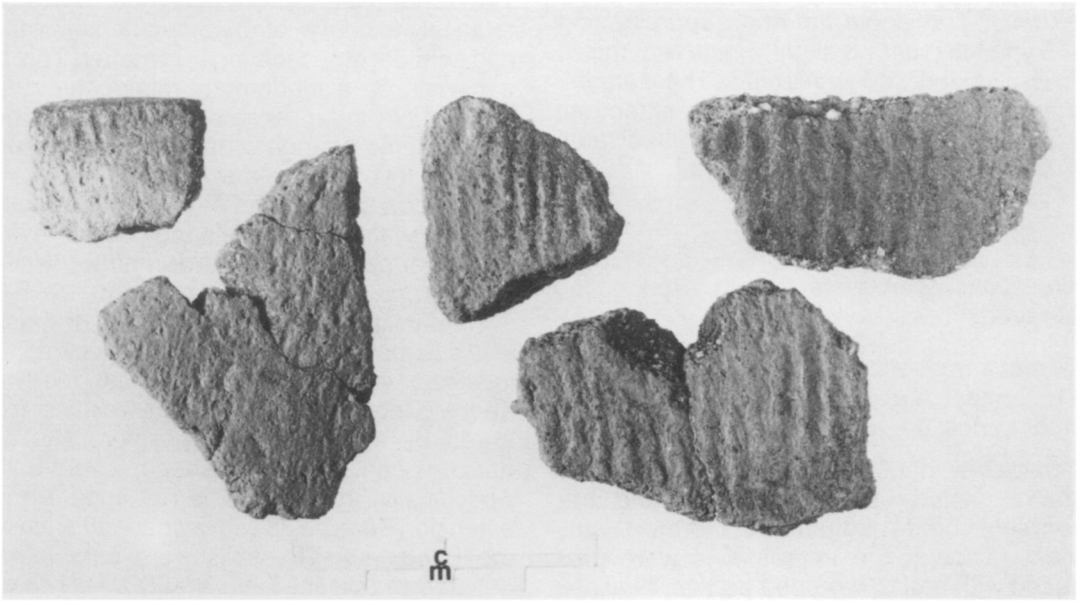

Fig. 8. Sample of Type IIIb, Obliterated Cord-Roughened Variety.

Surface Finish: Sherd exteriors exhibit obliterated cord impressions.

Nature of Surface Marks: The marks are fairly fine and evenly parallel but not clear, nor do they reveal the nature of the fiber. Some of the lack of clarity may be due to the porous nature of the clay and its dampness when being worked. The eroded condition of the sherds may also have contributed to the indistinctness of the impressions.

Frequency of Surface Markings: Ninety-two percent (31) of the sherds exhibit between two and three impressions per centimeter. Four sherds (12%) are more finely marked, with four to five impressions per centimeter.

Depth of Surface Markings: Eighty-two percent (28) of the sherds are shallowly marked (0.49 mm), and the remainder exhibit impressions of medium (0.50-0.99 mm) depth.

Form: No whole or partial vessels are reconstructable. There are some large sherds in Type IIIb (up to 9.2 x 4.0 cm), but none display any sharp edges or curves.

Wall Thickness: Thirty-one percent (10) of the sherd walls are medium thick (5.0-7.9 mm), and 69% (24) are thick (8.0-10.9 mm). The average thickness is 8.5 mm.

Rims: The single rim sherd representing Type IIIb (1048) is slightly incurved; the lip is rounded and unmarked. The parallel, vertically oriented impressions extend all the way to the lip. Rim curvature indicates that the vessel was approximately 12 cm in diameter.

Rim Profile: See Figure 4.

Condition: Sherds are heavily eroded and abraded.

Distribution: Horizon Aa — 6; Horizon A_1 — 11; Contact A_1/A_2 — 9; Horizon A_2 — 8 (including one rim sherd).

Comments: Identifying attributes of Type IIIb sherds include sherd thickness and the coarsely cord-roughened/obliterated surfaces. Though the impressions were produced with a cord-wrapped paddle, they are coarser than those exhibited in Type Ia. The degree of obliteration varies from partially obliterated to an almost smoothed surface (see Table 2). The paste is porous, dark, and heavily carbonaceous. Aplastics include coarse to very coarse crushed rock, angular to subangular clear quartz, a small amount of muscovite, and a smaller amount of hematite. Most of the sherds are carbonaceous through the entire core. Eighty-five percent of the specimens have a carbon streak, and exterior oxidized zones are of variable thickness. The color zonation could be due to differential firing or to burning subsequent to the initial firing process.

Type V, Unclassifiable

Type V is really a category rather than a type per se. It includes sherds that have only a single intact surface or none at all due to erosion or deterioration (Fig. 9). These sherds are not included in the statistical counts or discussions.

STRATIGRAPHY, DISTRIBUTION, AND CHRONOLOGY OF CERAMIC TYPES

The culture-bearing sediments at the Bayou Gulch site form a nearly homogeneous layer of fine to medium sands and intermixed organic matter of variable depth. The culture-bearing A horizon is divisible into three units. The uppermost horizon, designated Aa, is a relatively thin level of uncompacted silicates and semidecomposed organic matter. This is underlain by a moderately compacted and noticeably darker level, designated A_1. The stratigraphic change from A_1 to the underlying A_2 level is extremely subtle. The A_2 is slightly coarser than the A_1 level. The A units are underlain by a sterile sandy clay B level. The latter consists of a hard, orange, sandy Pleistocene terrace deposit (Grant 1979).

Variability in the depth of each of these levels across the site appears to reflect highly localized variation in depositional factors. There is no evidence of sheet washing followed by a secondary deposition. Not all horizons can be distinguished in every unit. Specifically, the A_2 level is not apparent in extension Feature 33 with a charcoal stain at the B contact. The soils were completely deflated in this southern area of the site.

In general, sherd counts for these levels

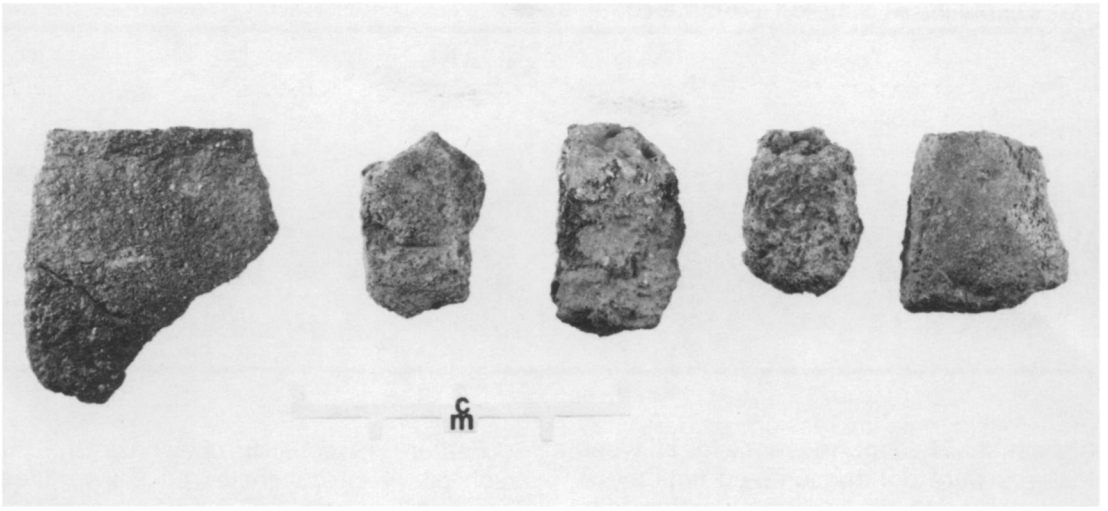

Fig. 9. Sample of Type V, Unclassifiable.

indicate that 80% of the total sample was concentrated in the A_1-A_2 level. The sherd counts for each level are included in each type description as well as in Table 3 (excluding sherds from Type V, which are those with eroded or laminated surfaces).

The total sherd count for the site does not yield a neat seriation curve. Such a curve would indicate some evolutionary development of the pottery. The A_1 level at Bayou Gulch had the highest sherd count frequency for all types, and Type Ia had the highest sherd count in all levels. Several kinds of pottery were apparently produced and/or used at Bayou Gulch contemporaneously, and different vessel types were perhaps produced for different functions.

Figure 10 illustrates horizontal variation in sherd distributions between the southern, deflated portion of the site and the northern area where soils are more deeply developed. This horizontal variation may be as revealing as vertical stratigraphy. The fact that certain excavated areas of the site lacked ceramics indicates that the sherd count distributions are not simply a function of the judgmental placement of excavation units.

Two observations demand attention. More than 60% (32) of the sherds in the southern one-third of the site were Type Ia (i.e., thin, clearly cord-impressed variety). Based on radiocarbon ages, the sherd-bearing levels in this part of the site were younger than the equivalent culture-bearing levels in the northern part of the site (Grant 1979).

The other striking aspect of the horizontal variation in the distribution of ceramic materials at Bayou Gulch is the large percentage of carbonaceous sherds in the northern, deeper portion of the site. Ninety percent (74) of the thicker, heavier Type III sherds are from the northern, deeper quadrants of the site.

The sherd counts and percentages indicated in Figure 10 do not accommodate sheer size variability. On a scale of small (7.0 mm or less), medium (7-15 mm) and large (15-95 mm), 100% of Types Ia and Ib sherds fall in the small and medium categories, and 97% (79) of Types IIIa and IIIb are included in the medium and large categories. The sherds of Types IIIa and IIIb are thicker. They seem to derive from medium-large to fairly large vessels. Sherd 3816-2824 (conjoined) measures 95 x 60 mm. This size is notable in a sample of sherds so badly fragmented that less than one-third of the total are analyzable.

Since it is unusual to identify comparable natural or arbitrary levels across a site this extensive, the difficulties of archaeological interpretation are considerable. Natural levels are not always continuous throughout the site, and it is meaningless to interpret the entire site by arbitrary levels. Yet if one examines sherds with exact proveniences, particularly within certain features, significant patterns emerge (Fig. 11).

Although the A_1 level contained the

Table 3. Distribution of Sherd Types by Level.

Level	Type Ia N	Type Ia %	Type Ib N	Type Ib %	Type II N	Type II %	Type IIIa N	Type IIIa %	Type IIIb N	Type IIIb %
Aa	10	18.9	10	24.4	2	15.4	9	18.8	6	17.6
A_1	23	43.4	18	43.9	5	38.4	22	45.8	11	32.4
A_1/A_2	4	7.5	3	7.3	3	23.1	12	25.0	9	26.5
A_2	16	30.2	10	24.4	3	23.1	5	10.4	8	23.5
Totals	53	100.0	41	100.0	13	100.0	48	100.0	34	100.0

highest sherd count frequency for all types, features were not encountered until the A_2 level. Therefore, this study concentrates first on sherds with a provenience within each feature equal to horizon A_2 and then will broaden its scope to include other levels, other features, and activity areas. By implementing this procedure, a sequence of types sometimes becomes clear. Associated radiocarbon ages may also contribute to the definition of patterns.

Feature 19 consists of a basin-shaped trash pit which dominates an activity area including Features 1, 2, and 3. A series of radiocarbon ages was obtained from a level equivalent to horizon A_2 in the excavated portion of the feature (i.e., in units 118N/54W and 120N/54W to 118N/56W and 120N/56W). Two distinct soil strata are visible in profile, though differences in artifact content were not identified. Materials retrieved from the fill included charcoal, fire-cracked rocks, abun-

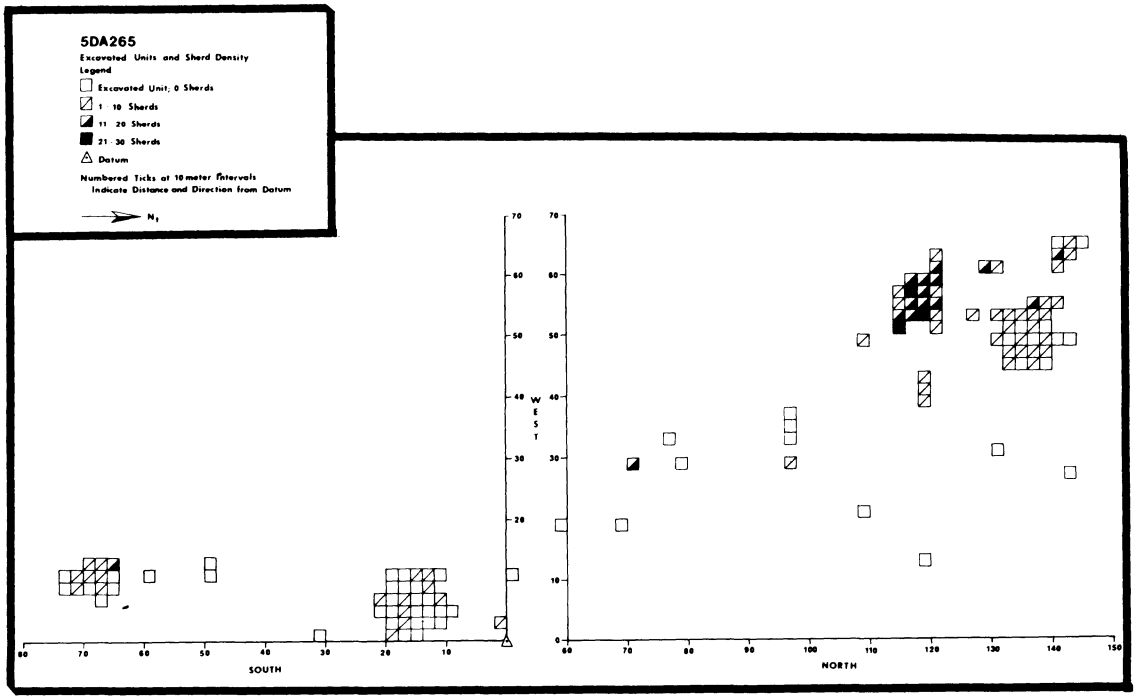

Fig. 10. Sherd distribution in excavated portions of the site.

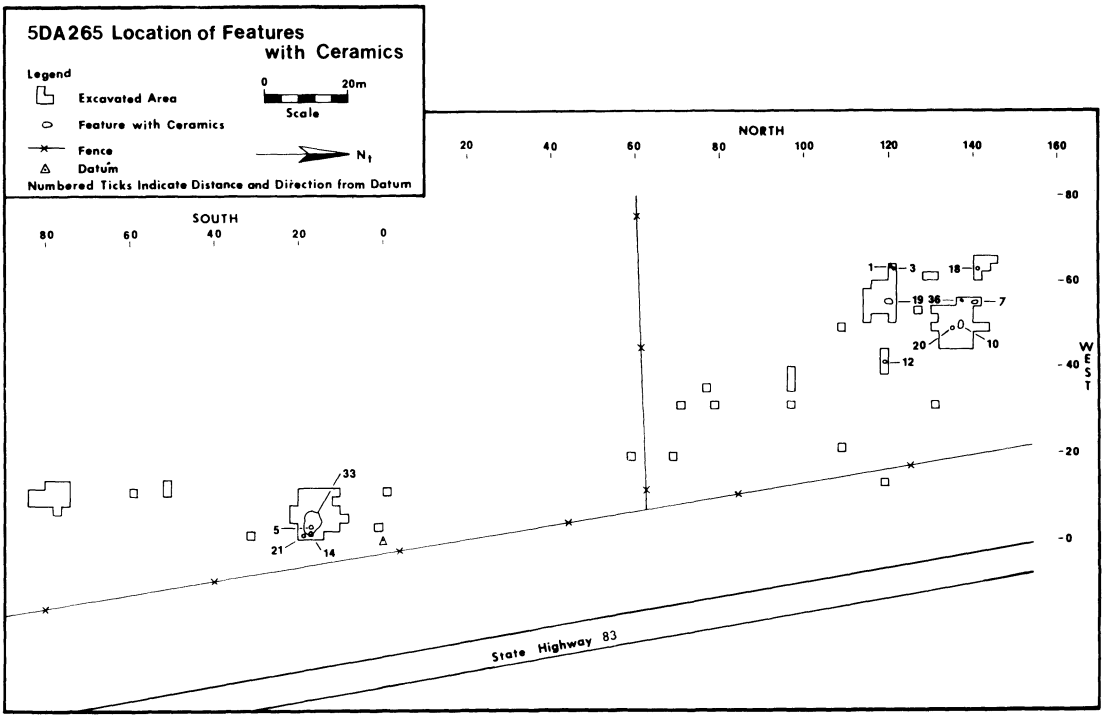

Fig. 11. Location of features containing ceramics.

dant bone, lithic tools, utilized and non-utilized flakes, groundstone, and sherds. The fire-cracked rocks and charcoal were from the lower horizon about 40 cm below ground surface, where most artifacts were located (Grant 1979). One Type Ia rim sherd (602), which derived from the fill of Feature 3 (grid unit 120N/62W) and was associated with projectile point 204, is punctate embellished. From grid unit 118N/56W, sherds 1163 and 1962 of Types Ia and Ib, respectively, are rim punctated. Sherd 1168 of Type IIIa from Feature 19 carries one clear, rounded punctate impression.

Feature 12, a less extensive firepit, was located in grid 118N/40W. Vertical dimensions were from 22 to 60 cm below ground surface. This feature contained flakes, a projectile point, charcoal bone, and two sherds (1046 and 1048). These two sherds were located in the level equivalent to the A_2 horizon and were of Type IIIb. Sherd 1048 was found in association with a projectile point (see Fig. 12).

Feature 36, a rock-filled basin, consisted of a rock cluster of approximately 24 stones. Excavation revealed sherds associated with four groundstone fragments at 136N/54W. Sherds with exact provenience were Type II and Type IIIb.

Classifiable sherds with a provenience from the southern one-third of the site are limited to Type Ia. A combination of soil deposition and radiocarbon ages indicates that this is the more recently inhabited area of the site. Type Ia sherds dominated the southern 70 m of the excavation. Since surface artifact density was very light, only one test pit, which yielded no ceramics, was excavated in the central portion of the site (datum to 70N). Most of the sherds excavated from Bayou Gulch were from the northern part of the site, grid units 70N to 142N.

Figure 12 is a composite of information and establishes an absolute chronology for the site. Bayou Gulch pottery types and associated radiocarbon age information (see Table 2) are combined with the provenience data and outlines of associated projectile points. Some of the dated features at Bayou Gulch did not yield ceramics, and other features lacked radiocarbon or projectile point association. In Figure 12 the definitive sequence of dates with related sherds in-

cludes Feature 12 and the large activity area which also includes Features 1, 3, 19, and 19a. The associated projectile point forms are included to demonstrate consistency in ceramic manufacture in conjunction with consistency in projectile point typology. These diagnostic factors all aid in distinguishing terminal Woodland.

The combination of circumstances which provided the information in Figure 12 did not occur in other features where sherds were recovered. The thin, clearly and finely marked wares (Types Ia and Ib) were recovered from 12 to 23 cm below surface and are associated with radiocarbon ages of 940 ± 50 to 850 ± 50 years B.P. The thick, widely marked, coarse and partially obliterated cord-roughened sherds were recovered from levels 10 to 40 cm below ground surface and are associated with radiocarbon ages of 1060 ± 55 to 850 ± 50 years B.P.

DISCUSSION

In order to relate the Bayou Gulch collection to known pottery types, the sample was compared to documented whole vessels or sherds from other sites. Collections examined included a range of as many different wares and types as could be expected to occur at Bayou Gulch. Documented whole or partial vessels used for comparative purposes included wares with the following cultural affiliations: Woodland, Upper Republican, Dismal River, Fremont, Shoshonean, Crow, Pawnee, Apishipa, and Pueblo brownwares. The pottery yielding sites and their ages are listed in Table 4. These sites are located on low terraces along small streams (Kivett 1968) and are shown in Figure 1. Specific attributes considered in the comparative analysis are listed in Table 5. Commonalities are indicated in Figures 13 and 14.

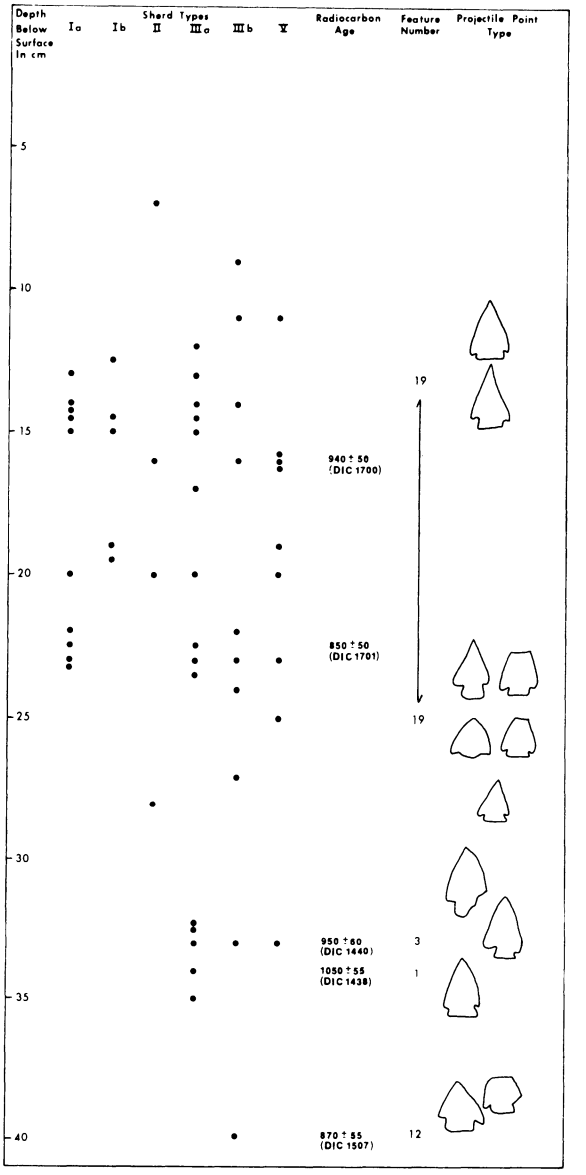

Fig. 12. Composite figure showing proveniences, pottery types, radiocarbon dates, and projectile point outline forms.

Examination of whole or partial vessels indicated that several factors may skew the results of the ceramic analysis. Variation in the depth, frequency of cord markings, or both may occur within different areas of a single vessel or, similarly, a combination of two or more different kinds of marks may be present on the same vessel. Wall thickness may also vary considerably within a single vessel, from rim to base. Measurements taken on whole specimens clarified the range of variation in wall thickness which can be anticipated in different portions of individual vessels. The fact that multiple sherds from a single vessel might be classified into more than one category is a serious problem (Champe 1946:74). In order to alleviate this problem to some degree, the Bayou Gulch sherds were compared to whole and/or partial vessels.

Table 4. Sites Yielding Comparative Ceramic Samples.

Site or Component	Years B.P.	Reference
Plains Woodland Sites		
Garrett Allen (48CR301)	920 ± 110	Frison, personal communication 1982
Seven Mile Point (48LA305)	—	Reher 1973
Schultz (25VY1)	950 ± 60 to 800 ± 50	Hill and Kivett 1940
Medicine Creek Reservoir (25FT13, 25FT16-18)	—	Kivett 1949
Massacre Canyon (25HK13)	—	Kivett 1952
Carmody (25HK7)	—	Kivett 1952
Kelso (25HO23)	800 ± 200	Wood 1967
Feye (25PT9)	—	Kivett 1952
Ash Hollow Cave, Lens D (25CD2)	950 ± 60 to 800 ± 50	Champe 1946
Magic Mountain, Types II and III	—	Irwin-Williams and Irwin 1966
Agate Bluff, Site IV	—	Irwin and Irwin 1957
Uhl, Zone D (5WL32)	1755 ± 95	Wood 1967
Hackberry Canyon (5WL33)	—	Wood 1967
McEndaffer Rock Shelter, Component A (5WL31)	—	Wood 1967
Hatch, Component B (5WL38)	—	Wood 1967
Franktown Cave (L:9:31)	—	Pustmueller 1977
Arkansas Frying Pan (5PE81)	—	Olson et al. 1968
Belwood (5PE278)	1150 ± 150	Withers 1954; Hunt 1975
Plains Woodland Sites		
Falcon Nest (5JF211)	—	Adkins et al. 1977
Cliff Swallow Cave	—	Morton 1954
Spring Gulch (5LR252)	935 ± 140	Kainer 1976
Woodruff Ossuary (14PH4)	611 ± 240	Kivett 1953
Coal Oil Canyon (14LO1)	—	Bowman 1960
Turner Look	—	Wormington 1955
Early Plains Village Sites		
Garrett Allen (48CR301) upper level	630 ± 100	Frison, personal communication 1982
48CO302	—	Reher 1973
Graeber Cave (5FJ8)	630 ± 75	Nelson and Graeber 1966
Roberts Buffalo Jump (5LR100)	—	Witkind 1971
T-W-Diamond (5LR200)	—	Flayharty and Morris 1974
Ash Hollow Cave (25CD2)	—	Champe 1946
Medicine Creek Reservoir (25FT13, 16, 17)	—	Kivett 1949
Lovitt (25CH1)	—	Hill and Metcalf 1941
HW (25HW9-17)	—	Gunnerson 1960
Carmody (25HK7, category B)	—	Kivett 1952
Peavy Rockshelter (5LO1)	810 ± 125	Wood 1967
Franktown Cave	—	Pustmueller 1977
Agate Bluff	—	Irwin and Irwin 1957
Spring Gulch (5LR252)	—	Kainer 1976

Table 4. (continued)

Site or Component	Years B.P.	Reference
Early Plains Village Sites		
Cedar Point Village (5EL8)	—	Wood 1971
Smiley Rockshelter (5EL9)	—	Wood 1971
Buick Campsite (5EL1)	—	Gunnerson 1960; Wood 1971
Coal Oil Canyon (14LO1)	—	Bowman 1960
Middle Plains Village Sites		
Lovitt (25CH1)	—	Gunnerson 1960; Hill and Metcalf 1941
Ash Hollow Cave (25CD2)	—	Champe 1946
48LA308	—	Reher 1973
Cedar Point Village (5EL8)	—	Wood 1971
Piney Creek (48JO311-321), Big Goose Creek, Big Horn Basin, Seven Springs, Ten Sleep Creek	370 ± 100 530 ± 110 340 ± 100 450 ± 110	Frison 1967, 1976
Carmody (25HK7)	—	Carlson and Jensen 1973; Grange 1968; Kivett 1952
Coal Oil Canyon (14LO1), category A	—	Bowman 1960

Of the whole or partial vessels examined, Bayou Gulch Type Ia (cord-impressed) and Type Ib (cord-roughened) most closely resemble the material designated as Valley Impressed from the Schultz site (25VY1). Additionally, these types compare favorably with ceramic material from the Uhl site (5WL32) and Agate Bluff site IV. All three of these sites represent the Valley phase from Nebraska (Hill and Kivett 1940). The distance between sites is not an obstacle to this interpretation if site location on stream terraces and the probability of aboriginal travel along tributaries or stream beds is considered.

Similarities between the pottery from the aforementioned sites include form and surface finish which seemed distinct and uniform in the Valley County (25VY1) pottery. The exterior surface of each type displays a general roughening of cord impressions. Each type is similarly decorated. A single horizontal line of punctates which produced a row of interior bosses appears in the site samples. These decorations are limited to the rim or near the lip of the vessels. Undecorated rims are usually direct. Lack of curvature in the Bayou Gulch sherd Type I sample suggests elongated body forms.

The single Bayou Gulch Type III sherd with undecorated, slight inner rim thickening is most like that from Agate Bluff (Irwin and Irwin 1957:25) and from the Hatch site (5WL38) in north-central Colorado (Wood 1967). Each of these sites yielded Woodland ceramic material, with only a few sherds exhibiting a slight thickening of the inner lip. Thickness of body sherds averaged 0.8 to 0.9 mm, and the sherds had worn, partially indistinct eroded surfaces.

Other sites which yielded ceramic material similar to Bayou Gulch Type III included Kelso (25HO23) in southwest Nebraska (Kivett 1952:36-37), Belwood in southeast Colorado (Withers 1954), and Woodruff Ossuary (14PH4) (Kivett 1953:118-119) and Coal Oil Canyon (14LO1) in northwest Kansas (Bowman 1960:20). In addition, four other sites revealed similar ceramic material: Medicine Creek Reservoir sites 25FT18 and 25FT19 (Kivett 1949:282-284), Feye (25PT9) (Kivett 1952:52-55), Lens D of the Ash Hollow Cave site (25CD2) (Champe 1946:36, 112), and Hackberry Canyon (5WL33) (Wood 1967: 203).

Bayou Gulch Type III, Obliterated Cord-marked with its Cord-Roughened variety, also closely resembles the Harlan Cord-Roughened material from the Davis Creek

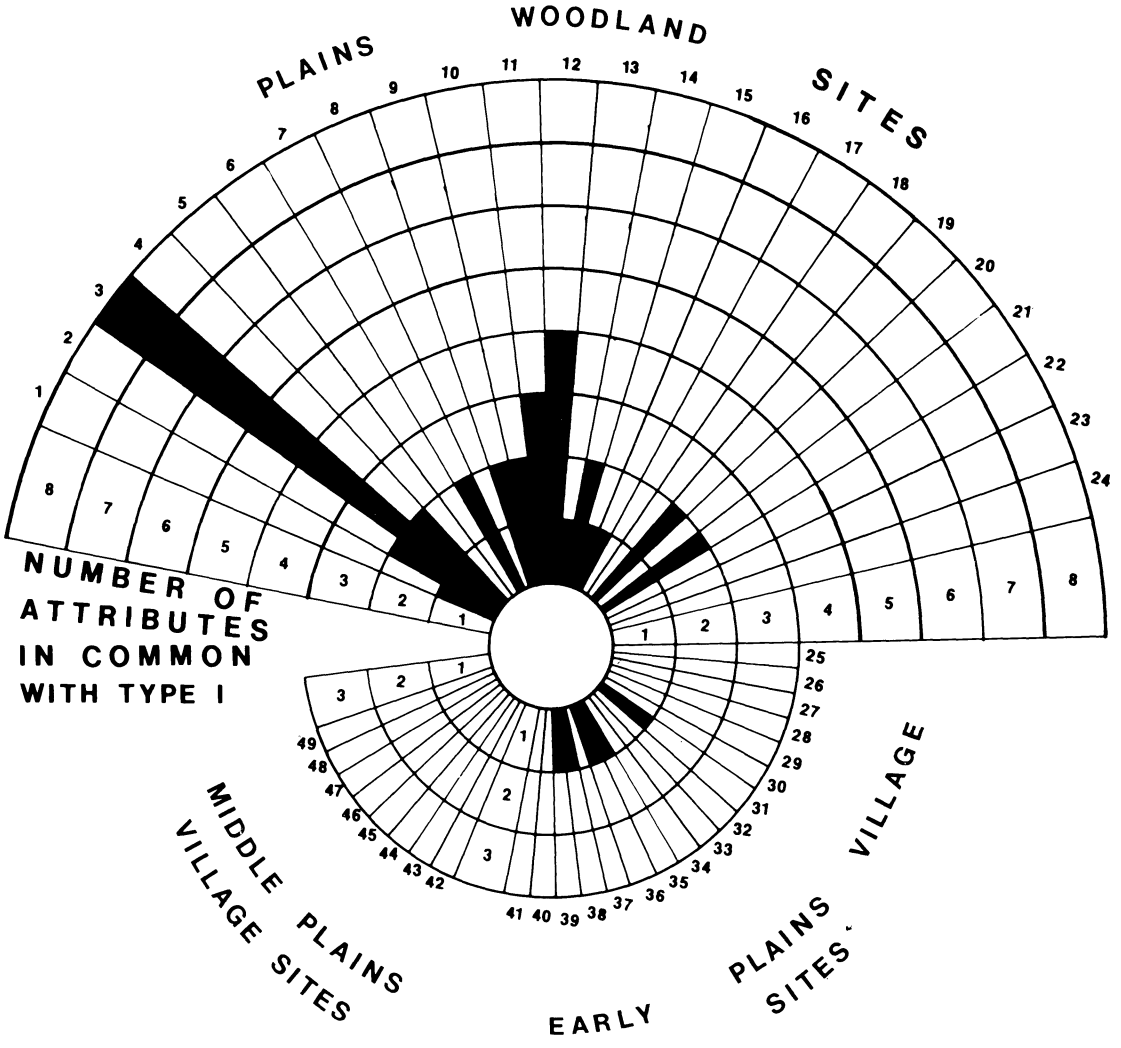

Fig. 13. Number of common attributes between Type I sherds from Bayou Gulch and other documented sites. The number of concentric units blackened indicates the number of attributes in common. The numbers at the ends of the rays represent sites listed in Table 4.

Valley site (25SM2) which is not included in Table 4. Sherds of both Harlan Cord-Roughened, associated with the Keith phase, and Valley Cord-Roughened, associated with the Valley phase, were excavated from a single burial pit at 25SM2 (Hill and Kivett 1940:219-222; Kivett 1953:133). Kivett (1953:120) recognized that calcite-tempered pottery types may be found with other aplastics, since calcite is not readily available in all sections of the Central Plains. Site 25FT96 demonstrated Keith phase Harlan Cord-Roughened pottery from western Nebraska which is tempered with sand rather than calcite inclusions (Carlson and Jensen 1973:15-16).

There is no common attributes figure for Types II and V. Type II consists of a disproportionate number of rim to body sherds. Sherds from Type V were too eroded to distinguish surface characteristics.

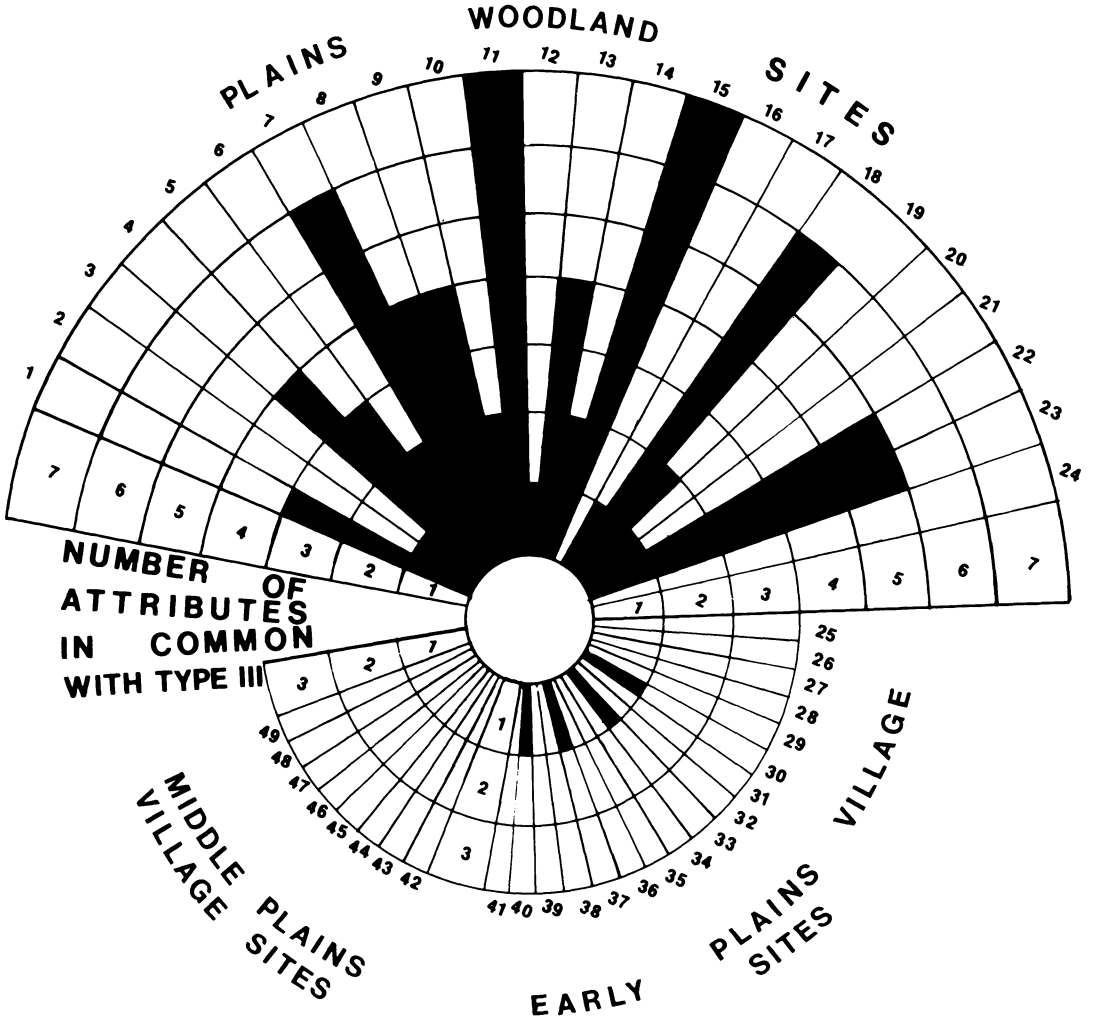

Fig. 14. Number of common attributes between Type III sherds from Bayou Gulch and other documented sites. The number of concentric units blackened indicates the number of attributes in common. The number at end of rays represents sites listed in Table 4.

CONCLUSIONS

The intent of this study was to construct a chronological frame of reference in which to order facts concerning the occupation at Bayou Gulch with special reference to pottery. After identifying this sample, the study first relates the sample to known Woodland manifestations and then places Bayou Gulch in a terminal Woodland affiliation.

The ceramics from Bayou Gulch do not fall into distinct temporal groups. The evidence indicates that there were two functional ceramic types that are contemporaneous. The inhabitants of Bayou Gulch made and used thick, widely marked, coarse, and partially obliterated cord-roughened pottery during a long sequence of occupations. The thin, clearly and finely marked ware appeared during part of that period and is evidence that smaller, more delicate vessels were also manufactured. Were the same inhabitants making and using two types of pottery or were there two separate, closely related cultural groups sharing the open campsite area? The findings from Bayou Gulch substantiate the

premise that the use of the two types overlapped.

Possible cultural affiliations of the pottery makers are: Plains Woodland, terminal Woodland, transitional Woodland-Early Plains Village (Upper Republican), Early Plains Village (Upper Republican), Intermountain-Shoshonean, and newly migrated Athabascan.

Lack of pertinent evidence suggests the elimination of the latter three possibilities. In the initial portion of Plains Woodland manifestations, there were no ceramic materials recovered from Bayou Gulch. There were no collared rim sherds, globular-shaped potsherds, or associated side-notched projectile points as characterized in the Early Plains Village phase. In addition, serrated corner-notched projectile points were not found in association with the Bayou Gulch material as have been defined for the Hog Back phase, west of Denver. Flat sherds suggestive of a Shoshonean component or of the newly migrated Athabascan groups were not recovered. Therefore, the most reasonable alternatives are the terminal Plains Woodland and the transitional Plains Woodland-Early Plains Village categories. Since these traditions of pottery-making extend over long time-periods and display only minor changes in form and surface treatment, differences in attributes between any given period may be slight.

Early Plains Village is most clearly defined from Franktown Cave, where both Woodland and Upper Republican materials were found (Pustmueller 1977). None of the Bayou Gulch sherds demonstrated the degree of obliteration, high sheen/burnished surface finish, globular form, or presence of collared rims characteristic of the Franktown Cave material. A whole vessel from the Cliff Swallow Cave site (Morton 1954) seems to be intermediate between the ceramics recovered from Bayou Gulch and those found at Franktown Cave.

It can be said with certainty that Bayou Gulch fits the taxon and content of Plains Woodland lifeways. The site is located on a low terrace a short distance from permanent and intermittent streams. The Bayou Gulch ceramic-containing features were basinlike. They did not have distinct floors, and, as a result, material from floors and fill proved difficult to separate. However, the firm association of Bayou Gulch ceramics with small to medium, triangular, corner-notched projectile points and the accompanying radiocarbon ages (DIC-1438 and DIC-1701; see Table 2 and Fig. 12) place the site toward the end of the Woodland period.

Woodland occupation in Colorado spans from A.D. 150 through 1050 to 1100. The extensive nature of Woodland occupation emphasizes the degree of cultural continuity in the western Plains. For Bayou Gulch, site location, projectile point form, and radiocarbon-dated features containing cord-roughened conoidal-shaped ceramics all fall within the Woodland tradition. This study confirms the supposition that the Colorado Woodland culture can be considered an extension of a greater region — the western perimeter of the Central Plains. Finally, this evidence, when interpreted in a comparative fashion, points to a cultural occupation at the end of the Woodland period (ca. A.D. 1100).

The Bayou Gulch site is suspected to be affiliated more closely with Plains sites to the north. Bayou Gulch Type I ceramics most closely resemble those of the Valley phase, while Type III ceramics resemble those of the Keith phase of Nebraska. The Keith phase materials which Bayou Gulch Type III ceramics resemble may be the ceramic group that developed into the obliterated cord-marked sherds of the later phases. It is probable that gardening or the beginnings of corn horticulture took place along the floodplains of the small or intermittent streams.

Ceramic descriptions in the past have lacked clarity. For example, the terms "sand," which refers to size, and "grit," which refers to crushed rock, are non-identifying expressions. More precise terminology should be used in ceramic descriptions, especially concerning paste, inclusions, surface treatment, and form. Since the Franktown phase is most clearly defined from Franktown Cave, where both Woodland and Upper Republican materials can be found, further work should be conducted on such sites before this phase concept is used (Cassells 1983:170).

Woodland settlement patterns also need careful examination. Sites situated on low terraces above stream beds may have had a dual purpose — horticulture development and/or hunting camp use. Although rockshelters may have provided more protection, open campsites in proximity to water sources

Table 5. Common Ceramic Attributes between Bayou Gulch and Other Documented Sites.

Vessel Shape	Surface Markings
Lack of curvature implies elongated body form	Clearly cordmarked
Poorly defined shoulders	Finely cordmarked (4-5 marks per cm)
Pronounced shoulders	Coarselv cordmarked (2-3 marks per cm)
Globular shape	Deep cordmarks
Flat base	Shallow cordmarks
Size variation	Cord-roughened
Handles	Intentionally obliterated marks
Rounding base	Eroded obliteration
Constricted neck	Perpendicular to rim
Hemispherical body	Placed haphazardly
Straight walls	Obliteration increases near base
Truncated cone	Coils obliterated in wet paste
	Finger obliterated coils
Rim Form	Decoration
Simple — straight	Punctates
Flared	Incising
Thickened interior	Interior fingernail impressions
Smoothed or wiped	Burnished surface
Variety of forms	Handles or protuberances
Not related to body size	Deep grooved paddle marks
Collared rim	Rod impressed
Braced rim	Exterior fingernail impressions
Flattened	Hematite covered surfaces (red stain)
Wedge shaped	
Recurving	Paste Texture
Outcurving	Fine Compacted
	Medium grained
Wall Thickness	Coarse
Thick (7.0-10.0 mm)	
Thin (4.0-6.9 mm)	Paste Color
	Dark gray
	Light gray
	Pinkish gray

most likely encouraged purposeful planting. Further investigation into these areas is suggested.

The author proposes to search for whole or partial Plains vessels in order to compile a portfolio of intensive, parallel descriptions. These descriptions will include photographs, technical sketches, precise measurements, and an exact mineralogical analysis. This portfolio of information will be made available to other archaeologists working within the Plains area of Colorado. Such a compilation of information will lead to a typological chronology and will enable researchers to make statements concerning use, time, and cultural affiliation of the users. It will aid in describing the distribution of Plains pottery in eastern Colorado.

Finally, it is proposed that a complete report be undertaken for the Bayou Gulch site. There is a wealth of information that may clarify the site and its temporal affiliation, since its artifact inventory carries information concerning a number of cultural components in addition to the one examined here.

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