

July 22, 1981

Mr. Kenneth C. Reid
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Tulsa, Oklahoma 74104

Dear Ken:

Many thanks for sending along a copy of your Nebo Hill Phase: Late Archaic Prehistory In the Lower Missouri Valley. Being smack dab in the middle of this Nebo Hill culture, we are certainly pleased to have this for our archaeological files. Also, a little pleased that our thumb-in-the-dike archaeological efforts were of some use to somebody.

Haven't seen Mett for some time now but Mike Fisher chats with him on the telephone now and then. Hope to get down there before too long.

We would welcome any further writing on the Nebo Hill Phase if you would be so kind as to keep us on your mailing list. Thanks again. Keep up the good work.

Sincerely yours,

Don L. Reynolds, Asst. Director
St. Joseph Museum
Pony Express Museum

DLR:js

With best regards
- Ken Reid

THE NEBO HILL PHASE:
LATE ARCHAIC PREHISTORY IN THE LOWER MISSOURI VALLEY

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June 1981

Brown, James A., and James L. Phillips (editors)
in press The Midwest Archaic: Paleoecology, Stratigraphy, and
Archaeology. Urbana: University of Illinois Press.

INTRODUCTION

The purpose of this paper is to summarize in the form of a conventional phase definition the existing data on formal, temporal, and spatial dimensions of the culture historical taxon variously referred to as the Nebo Hill "complex" (Shippee 1948), "focus" (Hill 1960), or "aggregate" (Chapman 1975). In addition, certain aspects of Nebo Hill behavior are briefly described. These include settlement variability, subsistence economy, and ceramic technology.

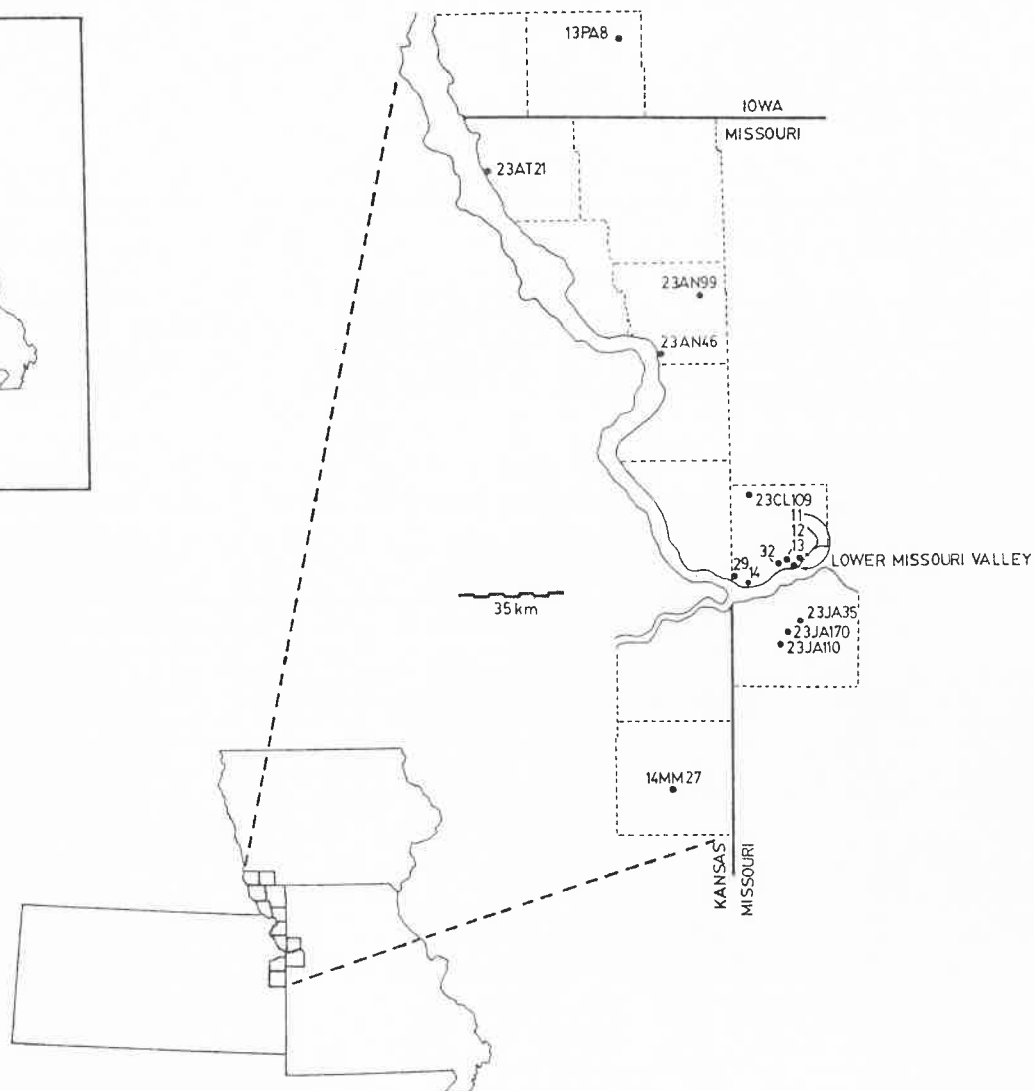
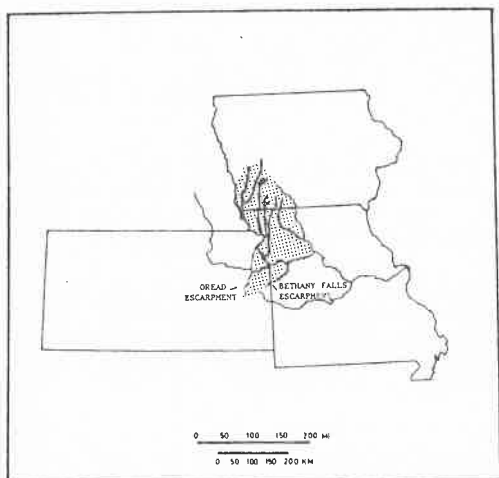
Previous research.

The Nebo Hill complex was first defined from surface collections made from the type site, 23CL11, and three related sites located in the loess uplands along the lower Missouri valley in Kansas City, Missouri (Shippee 1948). A trait list for these sites included narrow lanceolate projectile points, bifacial hoes, three-quarter grooved axes, flat celts, and oval manos, sometimes accompanied by small numbers of notched or stemmed points and potsherds that were assumed to be intrusive. The complex was identified as centered along the lower Missouri valley in northwestern Missouri and southwestern Iowa, and Shippee attributed it to a pre-Hopewellian time frame. In a later paper he argued for a direct historical relationship between Nebo Hill and the Angostura materials from western South Dakota, and suggested that the complex dated to about 6000 B.C. (Shippee 1957:46).

These two papers stimulated a considerable interest in the Nebo Hill materials that is reflected in a wide range of commentary that continued over the next two decades (Griffin 1955, Wormington 1957, Mayer-Oakes 1960, Hill 1960, Henning 1961, Wilson 1962, Bray 1963, Shippee 1964, Johnson 1974, Chapman 1975, Martin 1976).

Figure 1

Location of Nebo Hill sites discussed in the text. The box map shows the estimated boundaries of the Nebo Hill region based on survey data and examination of private collections in Kansas, Missouri, and Iowa, but not in southeastern Nebraska.



Most of these studies were based on the examination of uncontrolled surface collections, and temporal and historical inferences tended to rely on the juxtaposition of artifacts to illustrations of similar artifacts, rather than on the comparison of defined types. Their most useful conclusions concern the spatial rather than the temporal or formal dimensions of what will be defined here as the Nebo Hill phase. For example, a distribution map of Nebo Hill artifacts in amateur collections showed them to be concentrated along the Missouri River between the Platte (Nebraska) and Grand rivers, with core areas in the environs of Kansas City and St. Joseph, Missouri (Henning 1961:7), and both Johnson (1974) and Martin (1976) were able to discern a basic upland-lowland Nebo Hill settlement dynamic from the distribution of surface materials in surveys of tributary valleys.

A second stage of Nebo Hill investigations began in 1975 with controlled excavations at a series of Nebo Hill components scheduled for destruction by highway, flood control, and reservoir projects. These include the type site, 23CL11, overlooking the Missouri trench in southern Clay County, Missouri (Reid 1978, 1980a); the Nebo Hill component at 23JA110, a small terrace camp on the Little Blue River in Jackson County, Missouri (Reeder 1978, 1980); and another small terrace camp, 14MM27, in the Marais des Cygnes basin southwest of Kansas City in Miami County, Kansas (Blakeslee and Rohn n.d.).

In addition to these three block-excavated components, controlled test excavations and surface collections were made at 23CL109 on the Little Platte River in northwestern Clay County, Missouri (O'Brien 1977), and at 23JA35 and 23JA170, two large upland sites overlooking the Little Blue valley (Brown et al. 1977). Excavated materials from these six

Table 1

Locations, areas of surface scatter, and settlement types of Nebo Hill components discussed in the text.

<u>SITE</u>	<u>LANDFORM</u>	<u>AREA</u>	<u>RIVER BASIN</u>	<u>SETTLEMENT TYPE</u>	<u>SOURCES</u>
23CL11	Interfluv	9-16 ha	Lower Missouri	Warmweather basecamp	Shippee 1948, Reid 1978, 1980
23CL12	Interfluv	5-10 ha	Lower Missouri	Warmweather basecamp	Shippee 1948, 1964
23CL13	Interfluv	5-10 ha	Lower Missouri	Warmweather basecamp	Shippee 1948, 1964
23CL14	Interfluv	5-10 ha	Lower Missouri	Warmweather basecamp	Shippee 1948, 1964
23CL109	Floodplain knoll	4.9 ha ¹	Little Platte	-	O'Brien 1977
23JA35	Interfluv	10 ha	Little Blue	Warmweather basecamp, workshop	Shippee 1962, Wilson 1962, Brown et al. 1977
23JA170	Interfluv	1.5 ha	Little Blue	Warmweather basecamp	Brown et al. 1977
23JA110	Terrace	.2 ha	Little Blue	Small coldweather camp	Reeder 1978
14MM27	Terrace	1 ha	Marais des Cygnes	Small coldweather camp	Blakeslee and Rohn n.d.
23AN99	Interfluv	12 ha	Platte	Quarry, hunting camp	Reid 1981

¹ Based on the overlapping distribution of at least four cultural components. The Nebo Hill occupation is believed to be much smaller.

sites, and surface collections from four other high-density Nebo Hill components, including 23CL12 (Shippee 1948, Reid 1978), 23CL13 (Shippee 1948, 1964), and 23CL14 (Shippee 1948, 1964), three large upland sites in the loessial river hills of southern Clay County; and 23AN99, a chert quarry on the Platte River in northeastern Andrew County, Missouri. (Reid 1981), provide the data base for this discussion (Table 1).

It should be emphasized that these are not the only investigated Nebo Hill components in northwestern Missouri (see Stubbs 1950, Johnson 1974, Martin 1976, Reagan 1980). They were selected for this discussion because they include the known range of variability in settlement type (exclusive of transient bivouacs); site size, as measured by area of surface scatter; physiographic position and geographic range; and because they have all yielded artifacts assignable to at least three of the formal types defined below.

THE NEBO HILL PHASE

Formal criteria.

The Nebo Hill phase is understood here as a "paradigmatic class of occupations defined by types and/or modes" (Dunnell 1971:202). The types are assumed to have historical specificity and to represent normative standards of artifact manufacturing behavior shared by members of the same social group, the Nebo Hill people. Seven lithic types and one ceramic ware, each of which is represented by artifacts at three or more of the ten selected components, are used to define the formal dimension of the phase (Table 2). These include Nebo Hill points, bifacial hoes, bifacial gouges, rectangular and ovate manos, rectangular celts, three-quarter grooved axes, and fiber-tempered pottery.

Table 2

Formal determinants and type definitions for the Nebo Hill phase.
(All metrics are from the 23CL11 sample.)

23AN99	14MM27	23JA110	23CL109	23JA170	23JA35	23CL14	23CL13	23CL12	23CL11
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ARTIFACT TYPE:

Nebo Hill point	+	+	+	+	+	+	+	+	+
Bifacial hoe	+								
Bifacial gouge	+	+	+	+	+	+	+	+	+
Rectangular mano	+	+	+	+					
Ovate mano	+	+	+	+					
Rectangular celt	+	+	+	+	+				
Three-quarter grooved axe	+	+	+	+					
Fiber-tempered pottery	+				+				

TYPE DEFINITIONS:

1. Nebo Hill points have a narrow lanceolate plan form (reshaped fragments may have a parallel-sided, straight-based stem); base morphology varies from straight to incurvate to excurvate, with the former sometimes formed by the striking platform remnant of the original flake blank; grinding of the haft margins or base is rare; cross-sections vary from planoconvex to lenticular to biconvex; facial flaking varies from collateral to selective non-patterned; shaping includes heat treatment and pressure flaking. Metrics: (n = 47) Length = 77.21 ± 16.89 mm; Width = 20.11 ± 2.75 mm; Thickness = 10.32 ± 2.24 mm.
2. Bifacial hoes have an elongate plan form with a double-beveled transverse working edge; hafting margins are ground but not notched or indented; shaping includes heat treatment and percussion flaking of tabular flake or core blanks; facial flaking is non-patterned; cross-section is planoconvex; transverse working edge commonly displays silica polish with greatest invasiveness on the dorsal face. Metrics: (n = 5) Length = 95.6 - 126 mm; Width = 39.2 - 52.5 mm; Thickness = 17.5 - 30.5 mm; Haft length = 40 - 70.4 mm; Weight 70.8 - 200.8 g.
3. Bifacial gouges have an ovate to elongate to trapezoidal plan form with a single-beveled transverse working edge; haft margins are often ground but not notched or indented; facial flaking is non-patterned; shaping includes heat treatment and percussion flaking of tabular flake or core blanks. Metrics: (n = 5) Length = 45.4 - 67.1 mm; Width = 35.4 - 54 mm; Thickness = 7.8 - 20.9 mm; Weight = 14.3 - 72.4 g.
4. Rectangular manos have a (sub)rectangular plan form and longitudinal cross-section; use-beveled ventral surfaces; dorsal surfaces commonly display a nutting (or bipolar) depression accompanied by dark gray staining; shaping includes percussion trimming and pecking and grinding of exfoliated slabs of Sioux quartzite and other glacial erratic lithologies. Metrics: (n = 1) 130.6 x 106.4 x 38.1 mm, 943.2 g.
5. Ovate manos have an oval plan form but are otherwise very similar to the rectangular forms in their wear patterns and dimensions.
6. Rectangular celts have rectangular rather than petaloid plan forms; proximal ends are straight to excurvate in plan form and rounded in cross-section and were not used as polls; grooves are absent but bilateral marginal notching is present on some examples; longitudinal cross-sections are narrow and parallel-sided, tapering gradually toward the bit; shaping includes percussion flaking of greenstone or dark igneous blanks, pecking, grinding, occasional polishing. Plan form dimensions are similar to three-quarter grooved axes, but they are thinner and lighter, usually weighing less than .5 kg.
7. Three-quarter grooved axes are grooved along both faces and on the outer but not the inner side; polls are cubical rather than rounded, with well defined planes; blades are straight on the inner, ungrooved side and curve toward the bit on the outer side; the groove is oriented perpendicularly rather than obliquely to the blade; bits are slightly excurvate with working edge chords consistently shorter than the hafting groove; hafting grooves are asymmetrical when viewed from the outer face, perhaps to facilitate lashing in the split haft; longitudinal cross-section is wedge shaped rather than parallel-sided; shaping includes percussion flaking of greenstone (dark igneous) blanks, pecking, grinding, occasional polishing (especially on larger specimens). Metrics: (n = 1) Length = 84.5 mm; Width = 50.2 mm; Thickness = 29.4 mm (at poll); Groove width = 16 mm, Weight 224 g.
8. Fiber-tempered pottery (see text).

It is likely that other formal types will eventually be incorporated into this definition. For example, a flat subrectangular metate was associated with the Nebo Hill component at 23CL109 (O'Brien 1977:76), quartzite "bowl-shaped mortars" have been collected from 23CL14 (Shippee 1948:31), a fully grooved axe is associated with a three-quarter grooved axe, a rectangular celt, and at least 12 Nebo Hill points at 23AN99 (Reid 1981:81), and fragments of at least one fiber-tempered human effigy clay figurine are reported at 14MM27 (Blakeslee and Rohn n.d.). However, none of these formal types have been represented by artifacts at more than one Nebo Hill component, and their utility as phase-defining criteria remains to be established.

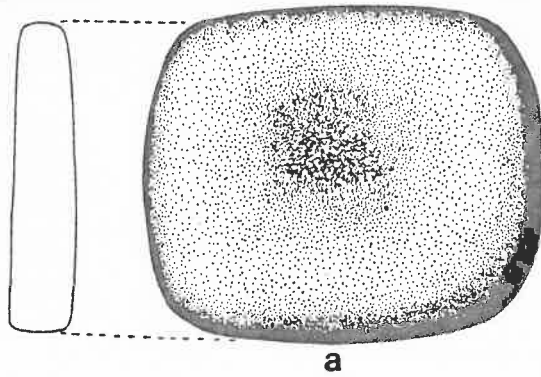
Chronology.

At 23CL11 a date of 3555 ± 65 (UGA 1332):1605 B.C. was obtained from carbonized walnut shells recovered from a sealed hearth below the A_p horizon (Reid 1980a:30-31). A smaller sample of charred wood from the Nebo Hill component at 23JA110 produced a date of 2970 ± 490 (DIC 913): 1020 B.C. (Reeder 1978:91). Currently these are the two most acceptable radiocarbon dates for the Nebo Hill phase. Absolute dating of these shallowly buried components has been plagued by poor preservation of organics and by the scarcity of sub-plowzone pit features.

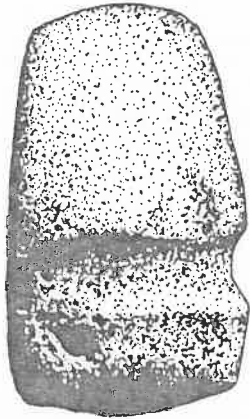
For example, two small charcoal samples built up from small bits of carbonized wood picked out of the Nebo Hill midden produced dates of 410 ± 100 (UGA 1329): A.D. 1540 and 1605 ± 105 (UGA 1330): A.D. 345, while a larger sample of carbonized bark immediately below the plowzone was dated at 470 ± 60 (UGA 1342): A.D. 480. These dates are obviously

Figure 2

Nebo Hill diagnostic artifacts: a. rectangular mano; b. three-quarter grooved axe; c. bifacial hoe; d-g. lanceolate projectile points.



a



b



c



d



e



f



g

5 cm

too late for the Nebo Hill component, and because there was no stratigraphic or typological evidence for either a Middle Woodland or a late Central Plains component, all three are rejected as anomalous. They may provide accurate dates of post-occupational forest or prairie fires, or they may simply represent badly contaminated (or insufficiently decontaminated) samples. Another date of 2220 ± 195 (DIC 914): A.D. 270 was obtained from a composite sample of charcoal from the Nebo Hill component at 23JA110, but was regarded as too late to date the Archaic occupation (Reeder 1978:91-92). It may reflect disturbance from the Middle Woodland component, dated at A.D. 150 ± 150 and A.D. 290 ± 75 (Reeder 1978:219).

A series of thermoluminescent (TL) dates run by Ralph Rowlett of the University of Missouri - Columbia on heated chert flakes recovered from the clay foundation wall of a small Nebo Hill structure at 14MM27 has produced dates that are compatible with the 1605 B.C. date for 23CL11 (Table 3). Data from this important site are still being analyzed, and will be discussed fully in a forthcoming report (Blakeslee and Rohn n.d.). However, these preliminary results suggest that TL dating of thermally altered chert may play an important future role in securing the chronology of carbon-deficient Nebo Hill occupations.

In the meantime, a number of analyzed components can be typologically cross-dated to absolutely dated phases and cultures in surrounding areas of the riverine midwest. Small notched points that fall within the range of variability associated with Merom Expanding Stem and Trimble Side Notched forms (Winters 1969:41) were recovered in situ at 23CL11 and 23JA110, and suggest contemporaneity with the Riverton culture of

Table 3

Absolute and relative dating of the Nebo Hill phase.

RADIOCARBON DATES:

<u>Radiometric Age</u>	<u>Calendrical Age</u>	<u>Nebo Hill Component</u>
3555 $\pm$ 65 (UGA 1332)	1605 B.C. (Reid 1978, 1980)	23CL11
2970 $\pm$ 490 (DIC 913)	1020 B.C. (Reeder 1978, 1980)	23JA110

THERMOLUMINESCENCE DATES:

1620 $\pm$ 300 B.C. (Blakeslee and Rohn n.d.)
1620 $\pm$ 300 B.C. (Blakeslee and Rohn n.d.)
1500 $\pm$ 300 B.C. (Blakeslee and Rohn n.d.)
2300 $\pm$ 1500 B.C. (Blakeslee and Rohn n.d.)

TYPOLOGICAL CROSS-DATES:

Phase/Culture

Riverton 3961 $\pm$ 140 - 3411 $\pm$ 235

2011 - 1461 B.C. (Winters 1974:xix)

Diagnostic Biface
Merom Expanding Stem

23CL11
23JA110

Trimble Side Notched

23CL11

Titterington/Sedalia

3950 $\pm$ 75
2910 $\pm$ 160

2000 B.C. (Cook 1976:65)
960 B.C. (O'Brien and Warren 1980:60)

Sedalia

23CL11
23JA35
23JA110

Eteley

23JA110

Old Copper

3450 $\pm$ 250

1500 B.C. (Stoltman 1980:139)

Osceola

23CL109

E1 Dorado

3600 $\pm$ 100 - 3500 $\pm$ 100

1650 - 1550 B.C. (Schmits 1980:23)

Dustin

23JA35

Helton

5440 $\pm$ 100 - 4880 $\pm$ 250

3450 - 2930 B.C. (Cook 1976:70)

Helton

23CL11

Dalton

7630 $\pm$ 120

5680 B.C. (Kippel 1971:65)

Graham Cave Notched

23CL11

southern Illinois. Sedalia and Etley points recovered in situ from at least three Nebo Hill components indicate contemporaneity with the Titterington phase or Sedalia focus of east-central Missouri and western Illinois. At 23CL109 the proximal fragment of a large, shallowly side-notched blade reminiscent of Osceola or Hemphill Notched forms was recovered in situ, and a complete specimen measuring 27.4 cm in length was in the landowner's collection from the site. These artifacts suggest contemporaneity with the Old Copper culture of the northern midwest. Finally, a stemmed Dustin point recovered from 23JA35 indicates contemporaneity with the El Dorado phase centered in the Flint Hills of eastern Kansas. These data are summarized in Table 3.

I have chosen not to include the two "Hardin Barbed" points identified at 23CL109 (O'Brien 1977:64) as evidence of Early Archaic cross-dates because this type is so easily confused with re-worked proximal fragments of angularly stemmed and barbed Etley points. However, a single Helton and a single Graham Cave Notched point found in situ at 23CL11 do represent clear historical anomalies, although both show signs of being recycled. Thus the Helton point falls within one standard deviation of the Koster sample ($n = 10$) in width and thickness, but is considerably shorter (within two standard deviations), probably because of blade reduction. The Graham Cave Notched fragment is barely recognizable as such due to severe bilateral reduction of the blade and notches. The simplest explanation for the presence of these two points at 23CL11 is that they are surface finds that were found at or brought to the site and recycled by Late Archaic occupants.

Spatial distribution.

The core area of Nebo Hill settlement is concentrated along the lower Missouri valley, especially between St. Joseph and Kansas City, Missouri. In part this distribution reflects a simple geological control, for it coincides with a belt of cherty Upper Pennsylvanian limestones that outcrop along a southwest-northeast axis between the Bethany Falls Escarpment on the east and the Oread Escarpment on the west. Lasting archaeological traces are more likely to be concentrated on landscapes formed in cherty limestones than those formed in shales, sandstones, or thin and nonsiliceous carbonates, and there is doubtless a recognition bias involved in the apparent scarcity of large, high-density Nebo Hill campsites between the Bethany Falls and Burlington escarpments to the east, and between the Oread Escarpment and the Flint Hills on the west. Nevertheless, for the area south of the line of Pleistocene glaciation, which coincides approximately with the lower Kansas - lower Missouri river system, these bedrock parameters provide convenient eastern and western limits to the Nebo Hill region (Figure 1:inset).

The southern limit of the Nebo Hill area seems to coincide with the upper reaches of the Marais des Cygnes or Osage River in the Kansas-Missouri border area below Kansas City. A small camp that included remains of at least one small oval structure with associated Nebo Hill points has been excavated at 14MM27 in the Hillsdale Reservoir (Blakeslee and Rohn n.d.). Further downstream in the Truman Reservoir area of Henry County, Missouri, Nebo Hill artifacts are scarce in surface collections and apparently do not occur

on the much more numerous Titterington phase components (Joyer and Roper 1980:20-21), suggesting a fairly abrupt cultural or political boundary in this area.

The northern limit of the Nebo Hill region is less clearly defined because of the north-south orientation of the major streams in northwestern Missouri. The Nodaway and Platte-One Hundred and Two basins head in the marshy tallgrass prairies of southwestern Iowa, but where the three major branches of the Nodaway converge to form a single stream in eastern Page County, they are deflected off their southwesterly axis by a monocline that forces the river straight south and postpones its junction with the Missouri to a point just above St. Joseph. The Platte-One Hundred and Two basin follows a parallel course south to Kansas City. The northerly orientation of these streams and of the high interfluves that separate them provided natural corridors into the rich game resources of the interior hinterland for populations centered along the Missouri trench.

The northernmost documented Nebo Hill site in Missouri is 23AN99, located on the Platte River in what is probably an outlier of a bedrock structural feature mapped as the Savanna dome (see McQueen and Greene 1938:78-79, Reid 1981:81-83). The site includes at least two quarry pits sunk into a ridgetop regolith of Shawnee Group chert, one of the few exposures of abundant nonclastic chert in the glaciated interior. Associated with the pits is a dense scatter of trimming debris, broken biface preforms, and groundstone rubble, from which at least 12 Nebo Hill points, two three-quarter grooved axes, and one rectangular celt have been recovered. Because of the unique conjunction of resources

23 AT 21

23 AN 46

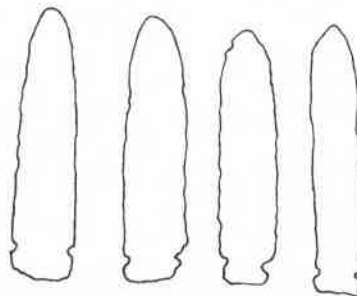
at this site, which affords abundant chert, timber, water, shelter, and a navigable stream that runs south to the Kansas City region, 23AN99 is optimally situated to serve as a basecamp for seasonal forays into the upper reaches of the Platte, One Hundred and Two, and Nodaway valleys.

Three other Late Archaic sites in this area require comment. These include two biface caches and one mortuary site, all destroyed by agricultural and construction activities during the 1970s. The burial area or cemetery, 23AT21, was located on the summit of one of the loessial river hills paralleling the Missouri trench in northwestern Atchison County. It included at least six burials, among them an infant and a juvenile, associated with four fragmentary Etley points made from exotic Burlington chert. The bodies were interred about 45 cm below the original ground surface, and there was no suggestion of either stone vaults or a mound (Reynolds 1973). In its ridgetop location, dispersed and shallow graves, and Etley point associations, 23AT21 resembles the more fully documented Titterington phase mortuary component of the Airport site in western Illinois (Roper 1978).

The larger of the two caches, 13PA8, was located on a ridgetop overlooking the West Nodaway River in Page County, Iowa, where plowing turned up at least 30 Etley and Sedalia points in such tight association that a cache pit may be assumed. All of the bifaces were made from Burlington chert, and there was no suggestion of a residential site in the vicinity (Reid 1980b). The other cache, 23AN46, consisted of five large Osceola-like blades recovered from a bluff overlooking the Missouri River in Andrew County, Missouri (Reynolds 1976).

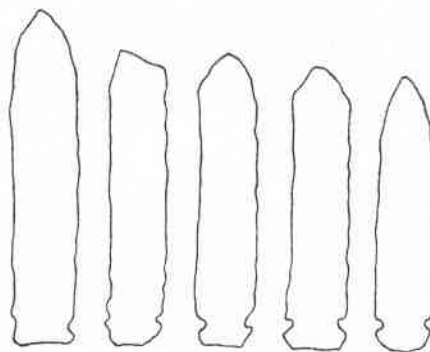
Figure 3

- a. Plan forms of Burlington chert bifaces from the cache at 23AN46 (redrawn from photographs of casts curated by the St. Joseph Museum).
- b. Plan forms of Burlington chert bifaces associated with unidentified pottery and extended burials in the earthen mound at 23CL29. (redrawn from Shippee 1964:33).
- c. Plan forms and cross-sections of fragmentary Etley points made from Burlington chert recovered from the hilltop cemetery at 23AT21 (redrawn from Reynolds 1973:4).



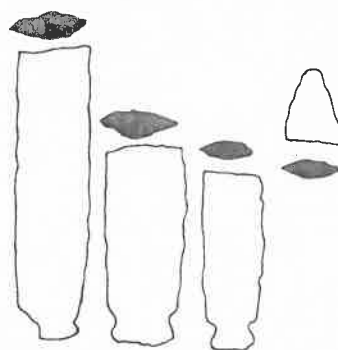
10 CM

a



10 CM

b



10 cm

c

These bifaces were also made from Burlington chert. In their morphology, dimensions, and flaking patterns, the 23AN46 specimens resemble the two large side-notched blades associated with the Late Archaic component at 23CL109 (O'Brien 1977). They presumably also are contemporaneous with a cache of ten similar blades reported at 23CL32, located on a ridgetop five kilometers southwest of 23CL11 (Shippee 1964:29).

Finally, both the 23AN46 and the 23CL32 cache blades closely resemble five large shallowly side-notched bifaces found with a lanceolate and a corner-notched point, a perforated slate pendant, a hematite bead, and, intriguingly, "some well made pottery", all associated with extended burials in a long "earthen barrow" excavated by Edward Curtiss of the Peabody Museum in 1879 (Wedel 1943:154-155). The earthen mound was part of a group of stone-chambered mounds later designated 23CL29/23PL29 (Shippee 1954), located along Wolfden Ridge on the Platte/Clay county line in Kansas City. The stone-chambered mounds were attributed by Wedel (1943:184) to local Hopewellians, but the earthen mound was not. However, in 1955 Shippee collected two charcoal samples exposed during leveling of what he took to be the remnant of the mound opened by Curtiss, and got radiocarbon dates of 1650 ± 250 : A.D. 300 and 1500 ± 250 : A.D. 450 (Shippee 1964:34), suggesting that the mound included both a Late Archaic and a Middle Woodland component.

All of these cache and mortuary bifaces are described as made from either Burlington chert or from a "rosy white chert" (Wedel 1943:155) or "rose" or "white" flint (Shippee 1964:32) that is almost certainly derived from Burlington formations that outcrop no closer than the Burlington Escarpment near the confluence of the Grand and Missouri

rivers. Wear patterns on some of the cache specimens from 13PA8 and 23AN46 show localized edge recession and notching, suggesting occasional use as knives and scrapers. However, more labor intensive modification is seen in the partial grinding away of flake scar arrises on the interior of the blade to produce a smooth, non-conchoidal surface. Similar smoothing or grinding is illustrated on surface finds recorded by Shippee (1964:31-32). It is always localized and incomplete, and the placement seems random rather than patterned.

To summarize this circumstantial chain of associations, it appears that bifaces diagnostic or at least highly reminiscent of such eastern taxons as the Old Copper culture (Osceola or Hemphill Notched) and Titterington phase (Sedalia, Etley) have a widespread distribution in northwestern Missouri, that they are consistently made from a visually distinctive and regionally exotic Mississippian chert, and that they frequently occur either as groups in cache or mortuary contexts in the vicinity of Nebo Hill campsites, or as typological singularities in Nebo Hill residential contexts. Conversely, these types do not occur as the major diagnostic biface at any documented campsites in northwestern Missouri, though they do occur in such contexts in northeastern Missouri (Klippel 1969, 1972). These facts taken together suggest the obvious hypothesis that biface caches such as 13PA8, 23AN46, and 23CL32, and mortuary sites such as the 23AT21 cemetery and the probable Late Archaic component of the burial mound at 23CL29, are all part of the same Nebo Hill cultural system that includes the large upland sites, the smaller tributary terrace camps, and the chert quarry sites. Such a conjecture adds a plausible element of diversity to the Nebo Hill site inventory, but it remains to be tested by more intensive regional surveys and by additional well controlled associations among these biface types in Nebo

Hill middens and features.

Turning now to more specific aspects of Nebo Hill behavior, the remainder of this paper will discuss the excavated materials from 23CL11, focusing on questions of subsistence, site function, and ceramic technology.

EXCAVATIONS AT 23CL11

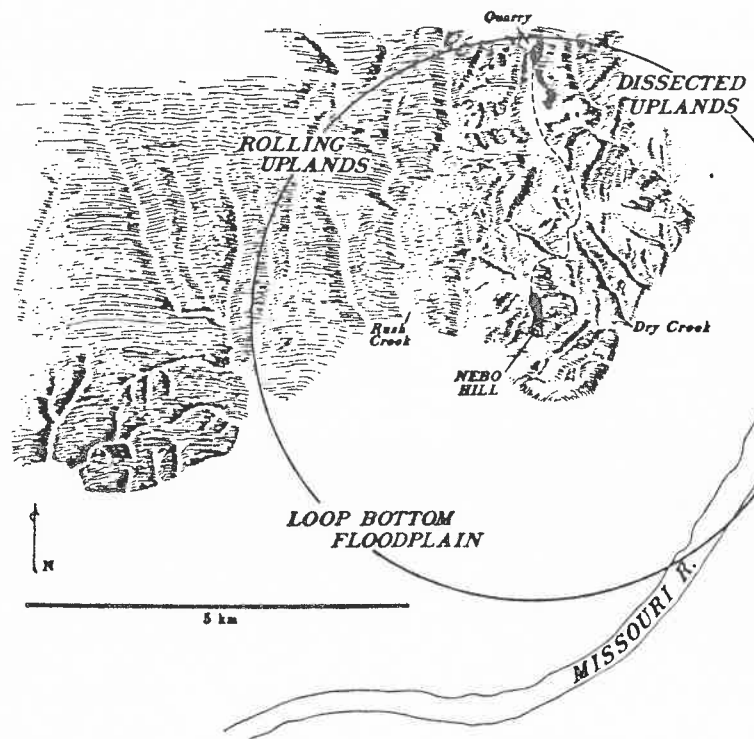
Nebo Hill is a loess mantled promontory that overlooks the floodplain of the lower Missouri River 15 kilometers east of metropolitan Kansas City. The site area, defined in terms of a surface lithic scatter, extends over at least nine and perhaps as many as 16 ha of the summit and west-facing spurs of a narrow, north-south running interfluvium. The northern limit of this debris scatter lies within four kilometers of extensive and shallowly buried deposits of Westerville chert, at least one of which coincides with a large quarry or workshop site, 23CL194, thought to be functionally linked to the 23CL11 assemblage. A circular catchment based on this radius defines a 50 km^2 area from which all of the identified plant and animal remains and over 99% of the lithics could have been derived, suggesting that the site is pivotally situated to exploit the game, mast, and glacial till resources of the dissected loess uplands, the game, forb, and bedrock chert resources of the rolling upland prairies, the aquatic foods and alluvial clays of the floodplain bottoms, and the line of communication and transportation represented by the Missouri River (Figure 4).

Test pits and a backhoe trench placed within the area to be intercepted by a highway corridor indicated that intact sub-plowzone deposits remained along the western summit and northwestern spur of the ridge, and by the

Figure 4

Empirically determined resource catchment at 23CL11, type site of the Nebo Hill phase located in the river hills of southern Clay County, Missouri.

**TERRAIN VARIABILITY WITHIN THE
NEBO HILL CATCHMENT**



end of the second eight-week field season, a 211 m² block was excavated in this area. The stratigraphy consisted of a shallow A_p horizon (Zone I), a dark, organically stained cultural horizon or anthropic epipedon varying in thickness from 20-40 cm (Zone II), and an underlying culturally sterile C horizon formed in loess (Figure 5). The assemblage and features were concentrated in Zone II and represented a single cultural component, though possibly more than one occupation. Various natural transformation processes, including cryoturbation, tree root growth, rodent burrowing, and earthworm casting created a considerable amount of vertical disturbance within Zone II, especially in the midden deposits along the western third of the excavation. Refitted fragments of the same artifact were vertically displaced by as much as 17 cm in this area.

Eleven features were recorded. All of them relate to cooking or at least to heat generation, and no storage pits or postmolds were encountered in the test units or the block excavation. A shallow, basin-shaped pit designated Feature 2 contained most of the carbonized plant remains and some pieces of heat treated tabular chert. This feature was bisected by the backhoe trench, and yielded the date of 1605 B.C. reported above. Features within the block included a dismantled limestone oven, three diffuse scatters of burnt earth and charcoal flecks interpreted as remnants of uncontained surface hearths, and a series of coalescing heaps of badly burnt limestone hearth cleaning debris in the western midden units.

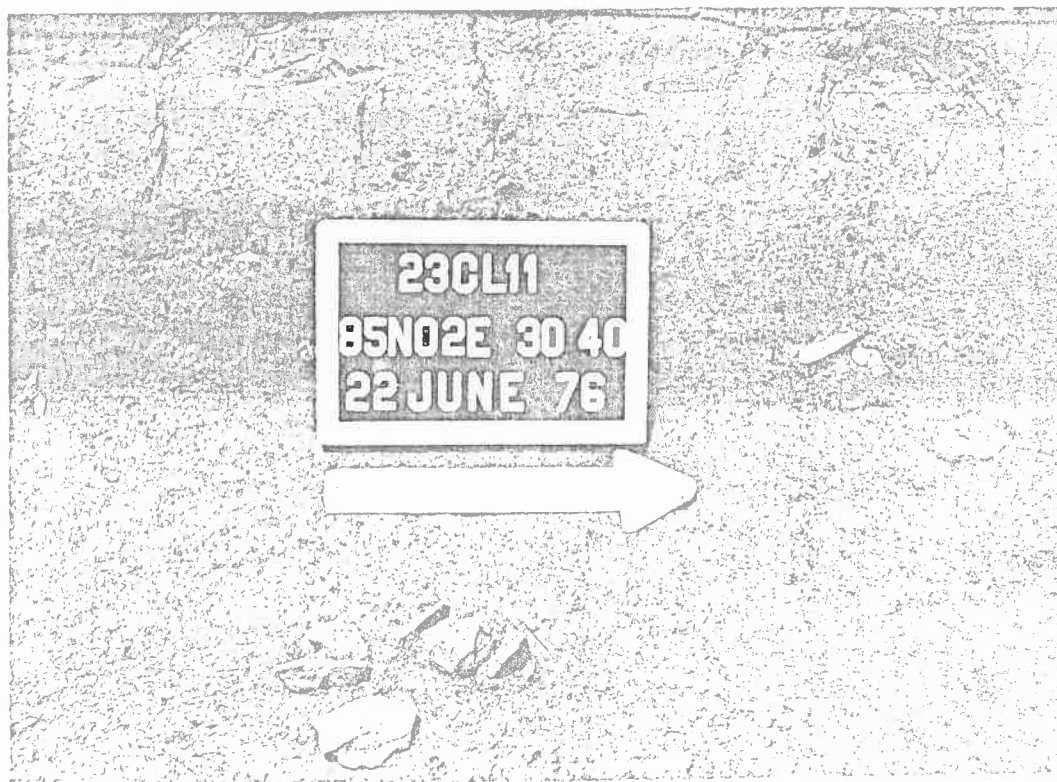
The distribution of artifacts and features within the block suggests that it straddles three distinct activity areas. From east to west these were designated the Domestic Activity Area, the Industrial Activity Area, and the Dump (Figure 6). The domestic area was characterized by the

Figure 5

Excavation stratigraphy at 23CL11: a. Zones I and II appear in the profile, culturally sterile Zone III in the foreground); b. flake concentration at the base of the darkly stained Zone II cultural deposit.



a



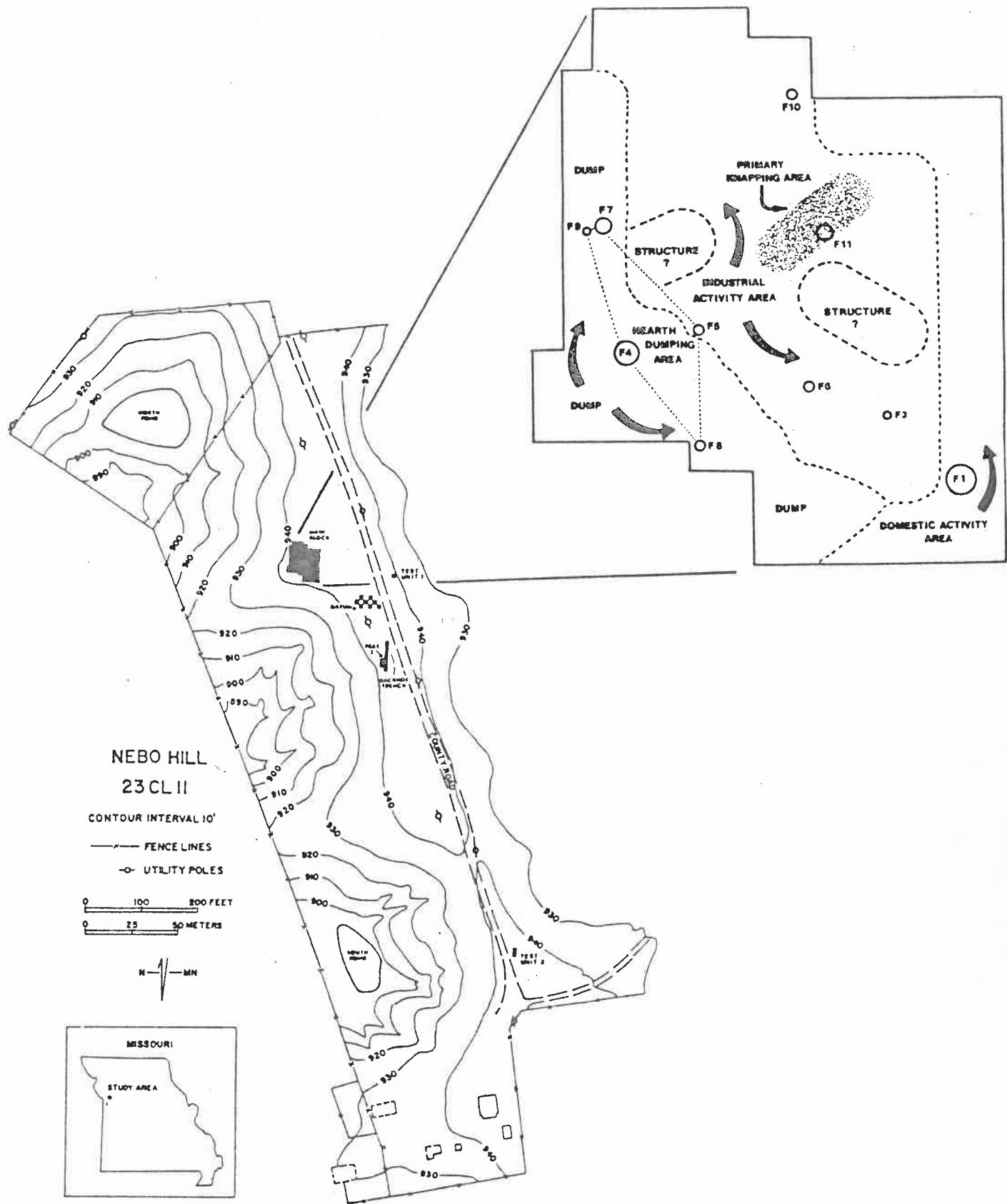
b

dismantled limestone oven, a low debitage density, a low tool density but a high proportion of unbroken or only slightly damaged tools, and an absence of midden staining. The Dump was characterized by high densities of debitage, cores, groundstone rubble, broken tools and preforms, heaps of hearth cleaning debris, and pronounced midden staining. Between these two areas lay a zone characterized by intermediate debitage densities surrounding obvious primary knapping loci composed of debitage "hot spots" and hammerstone and preform clusters. This zone was apparently an industrial or stoneworking area adjacent both to the Dump (and downslope debris fan) and to the cooking, eating, and sleeping area on the level interior of the summit.

In retrospect it is clear that too much effort was spent in the largely fruitless pursuit of organics in the western Dump, and that a larger area should have been opened up in the domestic area to the east and south where features are probably concentrated. Nevertheless, the large tool sample recovered from the Industrial Activity Area and the Dump suggests both that tools were produced in greater quantity and discarded in a more intact condition at 23CL11 than they were at the small terrace camp at 23JA110 (Figure 7), the only other component for which quantitative subsurface comparative data are available. Points and drills (mostly reworked points) are more than three times as common at 23CL11 (.5 per m^2) than at 23JA110 (.15 per m^2); other bifaces are over four times as common (1.33 per m^2 at 23CL11 and .39 per m^2 at 23JA110); grinding or plant processing tools are five times as common at 23CL11 (.25 per m^2) than at 23JA110 (.05 per m^2); and stone-working hammers are three times as common at the former (.18 per m^2) as at the latter (.05 per m^2). A plausible interpretation of these figures is that 23CL11

Figure 6

Location of main block and test excavation units within the proposed highway corridor at 23CL11. The "structures" shown in the activity area schematic represent areas of low debris density and are not defined in terms of postmolds, daub, or remnant wall structures.



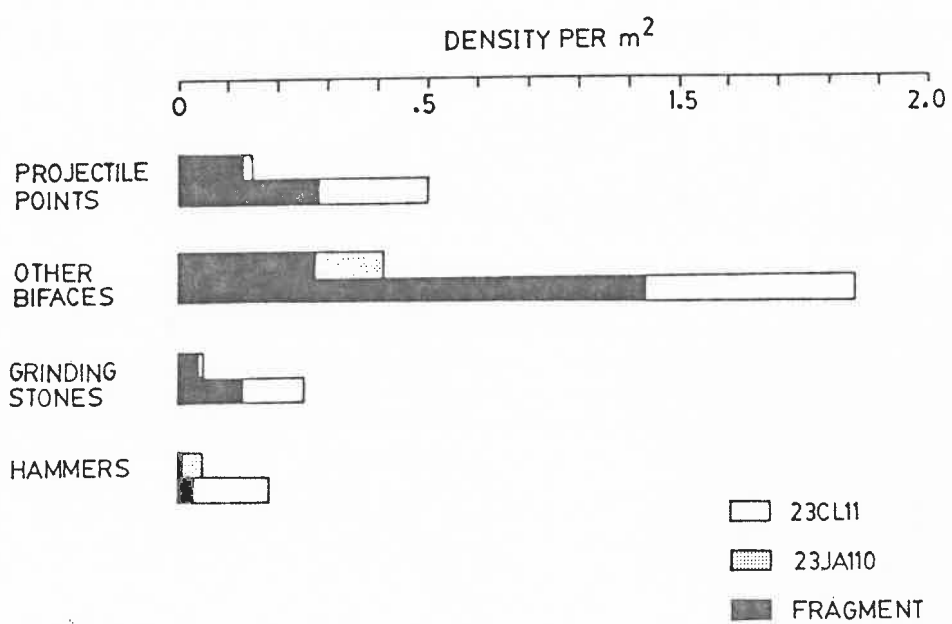
functioned as a workshop for surplus biface and groundstone tool production as well as a habitation site where such implements were consumed in everyday utilitarian tasks, while 23JA110 was primarily a habitation site where tools were brought in and consumed to exhaustion. Subsistence.

Almost all of the recovered carbonized plant remains were concentrated in Feature 2, the shallow pit intercepted by the backhoe trench (Root 1979). The only species to occur in significant quantities were nearly 200 g of carbonized Juglans nigra shells, possibly used as a fuel for heat treating the chert cores and biface fragments found in the pit, and 119 carbonized Chenopodium seeds. Faunal remains were concentrated in the dismantled limestone oven designated Feature 1, and in two of the heaps of limestone hearth-cleaning debris, Features 4 and 5. The tendency for surviving bone to be associated with limestone features may reflect its partial mineralization caused by calcium transfer over time (Artz 1978). Identifiable remains were limited to elements of three white-tailed deer, three fish, one turtle, one duck and an unidentified bird, one squirrel, and one human incisor, the latter located in the midden and not associated with a feature.

From these meager data it appears that the Nebo Hill subsistence economy was based on essentially the same resource spectrum of deciduous forest and forest-edge species exploited by later Middle Woodland populations in the same area (Artz 1978, Root 1978, Reid 1980c). There is no evidence that the upland location of the site reflects a focus on grassland species such as bison, or that shellfish or aquatics figured prominently in the diet.

Figure 7

Comparison of tool densities in the 165 m² block excavations at 23JA110, and the 211 m² block at 23CL11. Both excavations averaged less than 60 cm in depth.



Widespread evidence for the cultivation of tropical cultigens such as squash and bottle gourd in post-hypsithermal eastern North America (Kay et al. 1980) raises the possibility of supplemental gardening at Nebo Hill. Although no domesticated botanics were recovered from flotation and waterscreening of features and midden units, their absence is more obviously attributable to the poor preservation context of the site than to prehistoric behavior. At present the only relevant information comes from the technology and the physical location of the site. The axes, celts, gouges, and hoes that recur in the assemblages of the large upland sites along the Missouri trench indicate that the enlargement and maintenance of forest clearings and the removal of opaline prairie sods was technically feasible, and the consistent association of these sites with the most fertile and calcareous soils in the region, the Knox and Marshall silt loams of the loessial river hills, may reflect their horticultural potential as well as their high natural biomass (Reid 1980a:59-60). Once gardens were established in such upland clearings they could be maintained indefinitely without resorting to swidden because of the extreme fertility and great depth of the loess formations. In light of the prior appearance of tropical cultigens in the western Ozarks (Chomko and Crawford 1978), it seems likely that palynological or macrobotanic traces of squash or bottle gourd will eventually be recovered from Nebo Hill sites more deeply buried than 23CL11.

With or without cultigens, the existence of large, high-density components such as 23CL11 and small, low-density components such as 23JA110 suggests that the subsistence economy followed a seasonal cycle that included a phase of warmweather social aggregation in the uplands,

and coldweather segmentation to the sheltered lowlands. Evidence for permanent village sedentism based on stored surpluses does not appear in the Kansas City area until the Middle Woodland period, ca. A.D. 1-500 (Johnson 1979, Reid 1980c).

Fiber-tempered ceramics.

Certainly the least anticipated artifact category recovered from the block excavation at 23CL11 were 85 fragments of fired, fiber-tempered clay, at least 35 of which are body and rim sherds of one or more ceramic vessels. The sample includes three rims, 32 body sherds with intact interior or exterior surfaces, one probable lug, and 49 badly eroded internal sherd fragments and pieces of fired, fiber-tempered clay paste that superficially resemble daub (Figure 8).

From bond fractures on all of the rims and on four of the body sherds, the vessels appear to have been built up from strips rather than "slab-built" around a core of plant fibers as described for contemporaneous wares in the Southeast (Peterson 1980:370). Irregular transverse fractures occur on 15 of the remaining body sherds, and 13 exhibit laminar or foliated fractures parallel rather than perpendicular to the curvature of the vessel. Many of the breakage surfaces have been rounded and smoothed, probably by abrasion with their soil matrix.

The paste is a homogeneous clay with no calcareous or glacial till inclusions. Silt-sized particles range from a low of about 5% to a high of about 15% in four thin sections. The largest grain size observed was about 1 mm. The paste is smooth and compact, and appears well consolidated. The sherds are quite small, with a modal weight of less than 1 g and a modal maximum diameter of 1.5 cm (Figure 9b-c).

Figure 8

Fiber-tempered pottery from the block excavation at 23CL11. The first two rows are body sherds, and the three sherds on the lower left are rims. On the lower right are two fragments of fired, fiber-tempered paste that resemble daub.

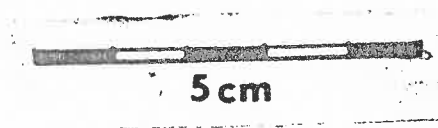
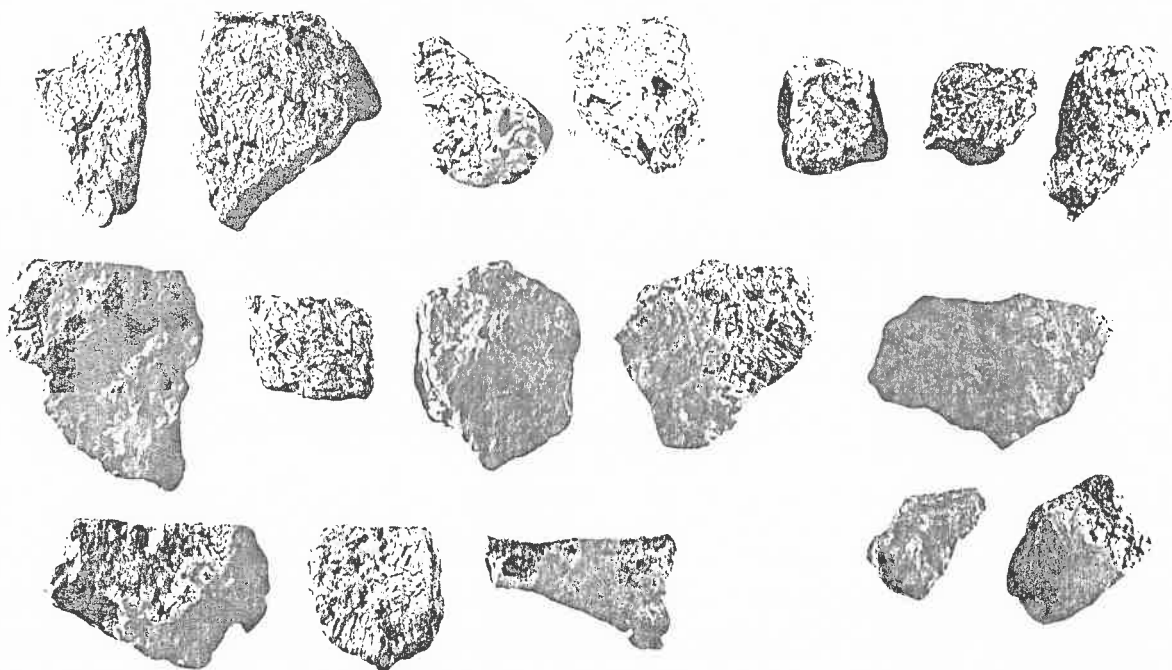
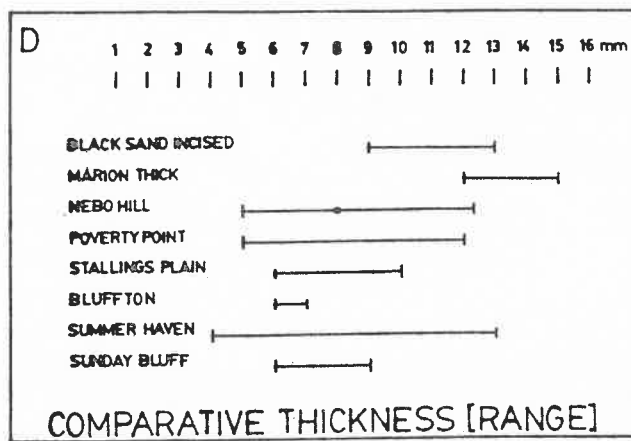
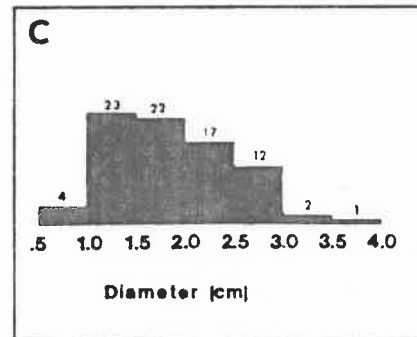
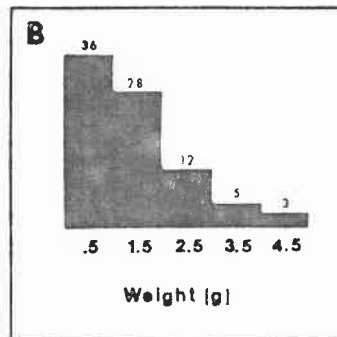
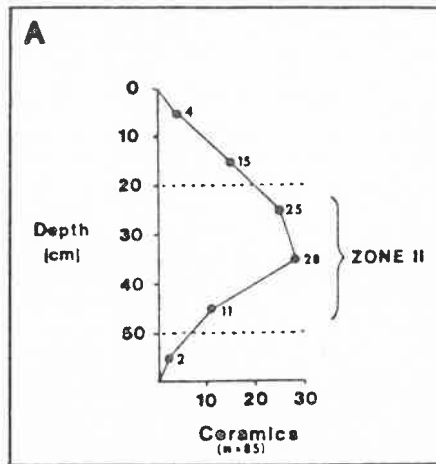


Figure 9

a. Vertical distribution of the ceramic sample; b. Weight distribution; c. Maximum diameter distribution; d. Thickness range compared with Early Woodland thickwares and Late Archaic fiber-tempered wares. (Data on Black Sand Incised and Marion Thick from Logan 1976; Stallings Plain from Griffin 1943; Bluffton, Summer Haven, and Sunday Bluff from Bullen 1972).

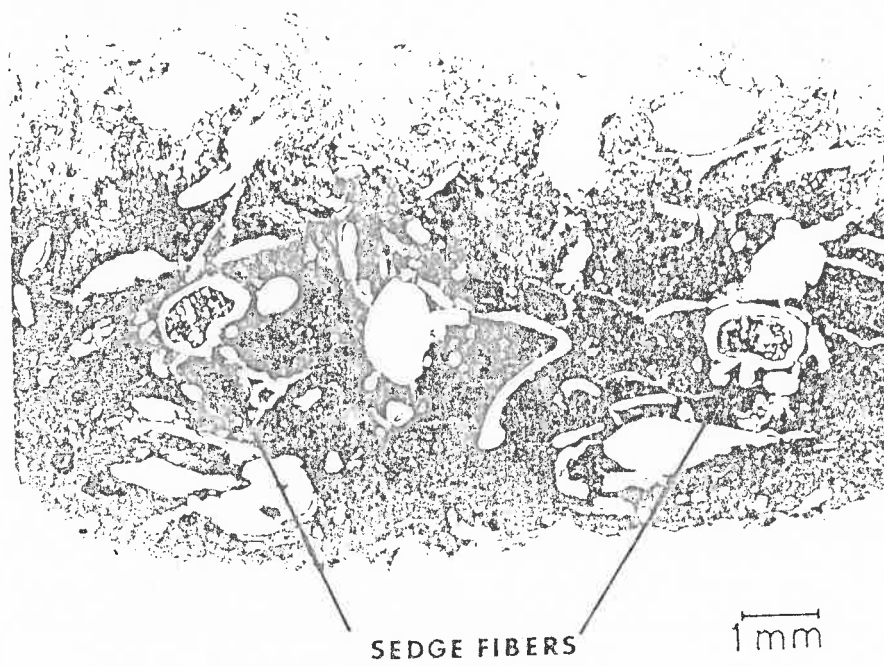


The original form of the vessels is uncertain. All three rims are direct, two with rounded lips and one with a flattened lip. On the 19 body sherds with both interior and exterior surfaces, body wall thickness ranges from 5 to 12.3 mm, with a mean of 8 mm. These figures are similar to other fiber-tempered wares in the Southeast, and are considerably thinner than midwestern Early Woodland thickwares such as Marion Thick and Black Sand Incised (Figure 9d). The probable lug projects 19 mm from the bond break and is 26 mm wide. A small boss less than 1 mm in height and 10 mm in diameter occurs on one body sherd, but the sample is otherwise undecorated. Exterior, core, and interior colors are typically reddish-yellow (7.5YR7/8) and less frequently buff or very pale brown (10YR7/4). Surfaces are evened and smoothed, lack carbon smudging, and are the same colors as the paste. A few cores are gray or very dark gray, but most have been completely oxidized. The shape and size of the original vessels cannot be determined, nor is it possible to say whether they were used as cooking vessels, storage containers, or both.

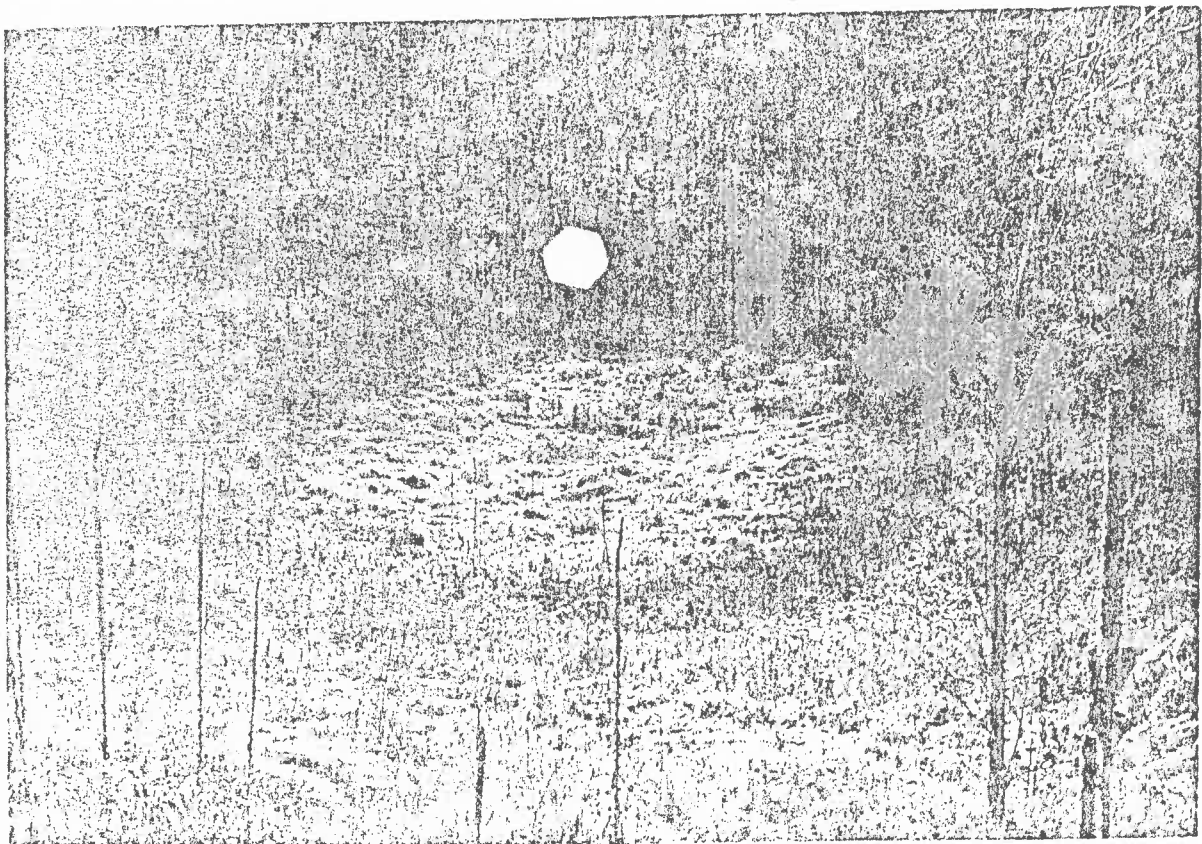
The temper is mostly shredded plant fiber, with occasional grog clastics. The fibers are well mixed with the clay and do not form a separate veneer between two layers of paste. Identified fibers include switchgrass (Panicum virgatum), big bluestem (Andropogon gerardi), and a monocotyledonous sedge that is probably bulrush (Scirpus). Switchgrass was identified from the shape and markings of the nodal portion of a grass culm on one specimen, and from a vein impression on another. The negative impression of an intact floret of big bluestem was identified from its size, shape, and dorsal groove. Bulrush was identified from a characteristic pattern of lacunae that recurred in four fiber impressions in a single thin section (Figure 10).

Figure 10

- a. Cross-sections of Scirpus fibers revealed in a body sherd thin section;
- b. Cattails and matted sedge vegetation in the basin of a seasonal pond located below the block excavation at 23CL11.



a



b

Smaller samples of fiber-tempered ceramics have since been recovered at 23JA35 (Schmits and Wright n.d.) and at 14MM27 (Blakeslee and Rohn n.d.), and until these sherds are described the Nebo Hill ceramics are best identified as a ware rather than as a type. However, they represent the earliest dated ceramics in the riverine midwest and although they are technologically quite different from contemporaneous Southeastern wares, their very existence further strengthens the eastern orientation of the phase indicated by the biface cross-dates.

Discussion.

In three significant respects, the Nebo Hill people can be seen as preadapted to at least the partial acceptance and part time use of ceramic vessels. First, a considerable measure of seasonal sedentism is evident in the settlement pattern. Both the quantity and density of debris and the extensive midden staining at the large upland sites suggest that residential stability was sufficient to permit the production and use of fragile clay vessels for part of the year at least. Sedentism has long been recognized as an enabling condition for the ceramicization of Late Archaic technologies on the Atlantic and Gulf coastal plains (Stoltman 1972:52), and in this respect, the Nebo Hill sites fall into a pattern that characterizes much of eastern North America at this time.

A second preadaptation is suggested by the fact that most ethnographic and eyewitness accounts of primitive pottery manufacture agree in emphasizing the amount of crushing, grinding, and pulverizing that is involved in the preparation of both the paste and temper. For the production of clay vessels to be added to an existing container inventory, it would be advantageous to already possess grinding and pulverizing skills and tools such as mortars, manos, metates, or simple grinding slabs (Amiran 1965). These tools are well represented in the glacial gravel groundstone artifact

inventory at Nebo Hill, and were probably as useful for processing clay and plant fibers as they were for grinding nuts, seeds, and hematite.

A third condition that could promote or permit experimentation with ceramics at Nebo Hill is the systematic heat treatment of chert cores and biface blanks and preforms. Thermal pretreatment is evident in every stage of biface production and maintenance at 23CL11, and is positively correlated with the high breakage rate of bifaces from the main block excavation (Reid 1980a:121-130). Despite the high number of manufacturing miscarriages that could be attributed to thermal shock, the chipped stone assemblage as a whole displays a routine ability to subject chert artifacts to even, surrounding, well controlled temperatures of at least 800° C. Presumably, the skills involved in selecting and manipulating fuels, drafts, flames, and coals for thermal alteration of chert could be transferred directly to the firing of ceramics.

The significance of this last factor is of particular interest given the regional variability in heat treatment that occurs in the midwest during the Late Archaic period. For example, contemporaneous Sedalia or Titterington technology has a biface reduction sequence where chert is rarely heat treated (Klippel 1972:43, Cook 1976:138), in complete contrast to neighboring Nebo Hill assemblages. Although the Nebo Hill bifaces are made from Upper Pennsylvanian cherts, and the Sedalia/Titterington bifaces from Mississippian cherts, this contrast is not obviously explicable in terms of variable raw material properties. For example, Middle Woodland assemblages from both lithological regions display considerable evidence of heat treatment in both unifacial and bifacial tools (Reid 1976:82, Streuver 1973:70).

The variable distribution in time and space of heat treatment as a shaping technique is an important problem in its own right, but one beyond the scope of this paper. It does illustrate, however, that if knowledge of ceramics was being widely communicated throughout the riverine midwest during the second millennium B.C., as the Nebo Hill data would seem to indicate, the emerging patchwork of contemporaneous ceramic and aceramic Archaic cultures may have been initially shaped by such regional diversity in lithic technologies.

SUMMARY

The Nebo Hill phase represents a hunting and gathering, pottery-equipped population centered in the lower Missouri valley between the Bethany Falls and Oread escarpments. Available dates place it in the second millennium B.C., in a post-hypsithermal climate with effective precipitation comparable to the period of historic record (Reid 1980a: 41-46, King 1980:10-11). Food remains show that deer and smaller game were hunted, and that oily nuts and starchy wild seeds were gathered. No evidence for Nebo Hill cultigens has yet been recovered, but tree-felling tools, hoe bits, and site locational regularities may point to supplemental gardening at the large upland settlements in the river hills. There is no evidence that any of these resources were stored in subterranean features.

The settlement pattern includes large, high-density sites on unsheltered interfluves that were probably abandoned in cold weather, and smaller, low-density sites on tributary terraces that were probably abandoned during wet weather. These are interpreted as indirect evidence

for a seasonal cycle that included a warm (wet) weather phase of social aggregation in the loess uplands, and a cold (dry) weather phase of social segmentation in the tributary valleys. In addition, hunting basecamps located on cherty bedrock outcrops in the drift mantled interior were probably established for seasonal exploitation of the game-rich Nodaway and Platte basins.

More speculatively, this model may be amplified by the addition of narrow earthen mounds containing extended burials accompanied by unidentified ceramics and large, exotic bifaces, represented by the probable Late Archaic component at 23CL29; by hilltop cemeteries such as 23AT21, with burials also accompanied by large exotic bifaces; and by widespread caches of the same lithologically and typologically exotic bifaces, that probably functioned as prestige items in a political or social economy rather than as utilitarian implements in the subsistence economy. Such distinctive, durable, and divisible wealth goods are more characteristic of an expansionist clan or lineage system practicing bridewealth and indemnity payments than they are of simple hand-to-mouth band level societies (Goody 1973:2-17, van den Berghe 1979:90-102).

The high degree of formalization apparent in utilitarian bifacial and groundstone tools recovered in Nebo Hill campsites is also suggestive of a population acutely conscious of both its social identity and its territory. Again, these are material correlates more easily associated with unilineal societies increasingly concerned with reproducing themselves as political and ideological units through time, rather than with bilateral kindreds preoccupied with subsistence requirements and equipped with simple flakes and choppers.

From a cultural materialist perspective, the development of parallel political and subsistence economies as reflected in Nebo Hill lithic technology must ultimately be grounded in the geology of the Kansas City region, specifically, in the distribution of the tabular cherts and igneous and metamorphic glacial clasts necessary for large-bladed bifaces, axes, and celts. Thus assuming conditions of relative subsistence security in the post-hypsithermal lower Missouri valley, a model may be outlined which identifies the "venetian-blind" or zonal distribution of cherty bedrock caused by regional cyclothem limestone deposition (Reid 1980d), coupled with the abundance of technologically valuable glacial greenstones and quartzites north of the lower Kansas and Missouri rivers and their abrupt drop-off south of this line, as the basic environmental condition of unequal distribution of durable commodity resources necessary to spark reciprocally allied and demographically equilibrating bilateral bands into unilineal, competitive, and demographically expansionist descent groups (Thomson 1949, Friedman and Rowlands 1978).

Increased participation in regional exchange systems involving exotic hard goods and the diffusion of innovations such as ceramics are expectable consequences of such a change in social reproduction and work force composition. A more fundamental change would be increases in population size and density, the necessary condition for later developments such as permanent village sedentism and intensified horticulture.

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