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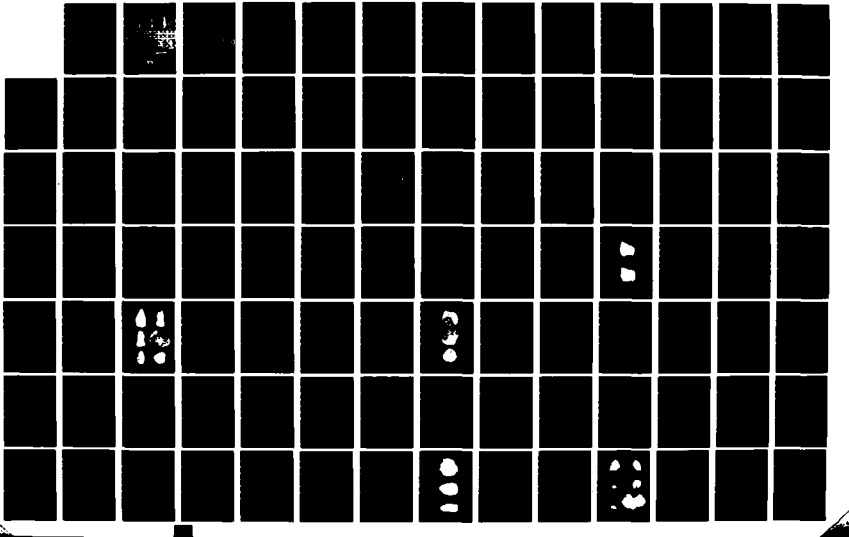

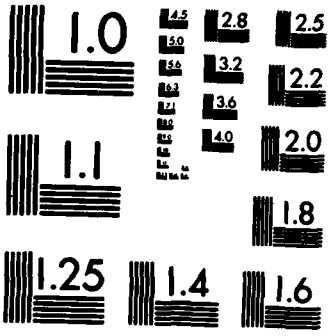

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PHASE IV ARCHAEOLOGICAL INVESTIGATIONS AT EL DORADO LAKE, BUTLER COUNTY, KANSAS, SUMMER 1980

Funded by the U.S. Army Corps of Engineers

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1983

ABSTRACT

As a continuation of a multi-year project, begun in 1977 and designed to mitigate the effect of construction work and flooding on local prehistoric and historic cultural resources at El Dorado Lake, Butler County, Kansas, a field party from the Museum of Anthropology at the University of Kansas conducted archaeological investigations at the Lake during the summer of 1980. The work was funded by the U.S. Army Corps of Engineers (Tulsa District) through Contract No. DACW56-77-C-0221 with the University.

During this final season of field work prior to the completion of El Dorado Lake, test excavations were conducted at three prehistoric sites of the Woodland period. Site 14BU72 is interpreted as a temporarily-occupied base camp, and 14BU73 as a small camp for specialized activities. Site 14BU5 is large and includes three sub-areas: A, B, and C. The test excavations in Areas A and C indicated limited cultural debris restricted to the plow zone, while Area B included more substantial remains, perhaps representing a seasonal occupation with structures.

Studies devoted to the historic period at El Dorado Lake included tests at the Doc Lewellen site, 14BU1005, and the Donaldson site, 14BU1008. In addition, further work was conducted at the site of New Chelsea, 14BU1007. The tests at the Doc Lewellen and Donaldson sites, designed to locate the original homesteads of 1857, were unsuccessful, apparently due to more recent developmental activities which destroyed the remains. Work at New Chelsea, consisting of a detailed surface collection designed to locate intra-site activity loci, was successful and five different types of occupations were identified.

A final chapter in the report provides a summary of work accomplished at El Dorado Lake from 1977-1980, the period of Corps of Engineers support.

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CHAPTER 1

PHASE IV INVESTIGATIONS OF THE PREHISTORIC PERIOD IN THE EL DORADO LAKE AREA

John M. Parisi

INTRODUCTION

During the summer and fall of 1980, the excavation and subsequent laboratory analysis of archaeological remains from the El Dorado Lake Project area, in Butler County, Kansas, were undertaken by the University of Kansas Museum of Anthropology, Lawrence, Kansas. These investigations constituted Phase IV of a multi-phase, four year study of the cultural resources at El Dorado Lake. The work has been done under contract with the United States Army Corps of Engineers, Tulsa District (Contract No. DACW-56-77-C-0221). The purpose of the Phase IV testing of prehistoric archaeological sites conducted during the limited 4-week 1980 field season, was to retrieve information consistent with the goals defined within the University of Kansas Museum of Anthropology's research design for the El Dorado Lake Area (See Leaf 1976).

Principal goals of the research design are:

> "(1) to retrieve data and test hypotheses on prehistoric subsistence and settlement systems; and, (2) to conduct an interdisciplinary program to retrieve data and test models of paleoenvironments useful for the study of prehistoric cultural-ecological relationships" (Leaf 1976:1).

Due to the large number of prehistoric archaeological sites within the project area (48 as of 1976) and the limited allotment of time in which to perform the fieldwork prior to the dam's closure, the testing of settlement pattern hypotheses, and the development of paleoenvironmental models will have to depend on data recovered from limited test excavations of archaeological sites, and a few more extensive excavations. At a minimum, test excavations should provide data on site depth, stratigraphic relationships of multiple components, the relative state of preservation of cultural debris and features, as well as, the cultural affiliation and significance of the

site. It is within this framework that Phase IV archaeological testing of prehistoric archaeological sites within the El Dorado Lake area was conducted.

ENVIRONMENTAL SETTING

Several detailed accounts of the natural environmental setting of the El Dorado Lake area have been published in recent reports (Fulmer 1976; Leaf 1976, 1979; Grosser 1977). In addition to these detailed accounts a more generalized description of the environmental setting of the El Dorado Lake area has been presented by Bastian (1979). Given the availability of these descriptions of the environmental setting of the project area only brief mention of a few of the more salient characteristics will be mentioned here.

El Dorado Lake is located within the Flint Hills Upland division of the Osage Plains section of the Central Lowland province. The Flint Hills, a north-south trending topographic feature located in eastern Kansas, are characterized by gently rolling topography which slopes toward the Arkansas River (Leaf 1976;1979).

The climate of the El Dorado Lake area is best summarized as continental, with cold, dry winters and hot, relatively wet summers. Leaf (1979) following Fulmer (1976) listed 5 probable resource zones which could have been exploited by prehistoric inhabitants of the area: (1) upland prairie, (2) floodplain forest, (3) breaks, (4) riverine and (5) oxbow swamp. The upland prairies would have been an important source of bison, deer and antelope. Water, as well as aquatic plants and animals, would have been available in the riverine and oxbow swamp localities. The floodplain forest would have provided nuts, berries, fruits, deer, elk, turkey and squirrel as well as raw materials for constructing shelters, cooking food or maintaining warmth. Leaf (1979:3)

noted that while the breaks, the steep and eroded slopes at the junction of the floodplain forest and prairie uplands had little to offer in terms of food resources, they would have been an important locus of chert suitable for prehistoric tool manufacture.

CULTURAL CHRONOLOGY

Systematic archaeological investigations, undertaken by the Museum of Anthropology, began in the El Dorado Lake area in 1967 with an archaeological reconnaissance conducted by Eoff and Johnson (1968). Since that initial survey considerable work has been performed within the project area including both testing (Artz 1981; Bastian 1979; Leaf 1979; Fulmer 1976, 1977) and large scale excavation (Adair and Brown 1981; Grosser 1970, 1973, 1977; Leaf 1981) of the prehistoric archaeological resources. A summary of excavations conducted prior to 1976 has led to the development of a cultural chronology for the El Dorado Lake area. Archaeological sites and materials representing the Archaic (2000 BC - AD 1), Plains Woodland (AD 1 - 1000) and Plains Village (AD 1000 - 1500) cultural traditions have been recognized in the resevoir area (Leaf 1979:10).

Several multi-component Archaic sites have been excavated. The presence of different artifact inventories and differences in the intensity of occupation within the Archaic components excavated, indicate that both larger base camps and smaller extractive or more specialized hunting camps were occupied. The subsistance economy during the Archaic was based on hunting and gathering with apparent oscillations in intensity through time. Features and artifacts recovered from excavations at four Archaic sites within the reservoir indicate that a variety of activities were performed at the camps, including tool manufacture, animal and plant processing, woodworking, and cooking (Leaf 1979).

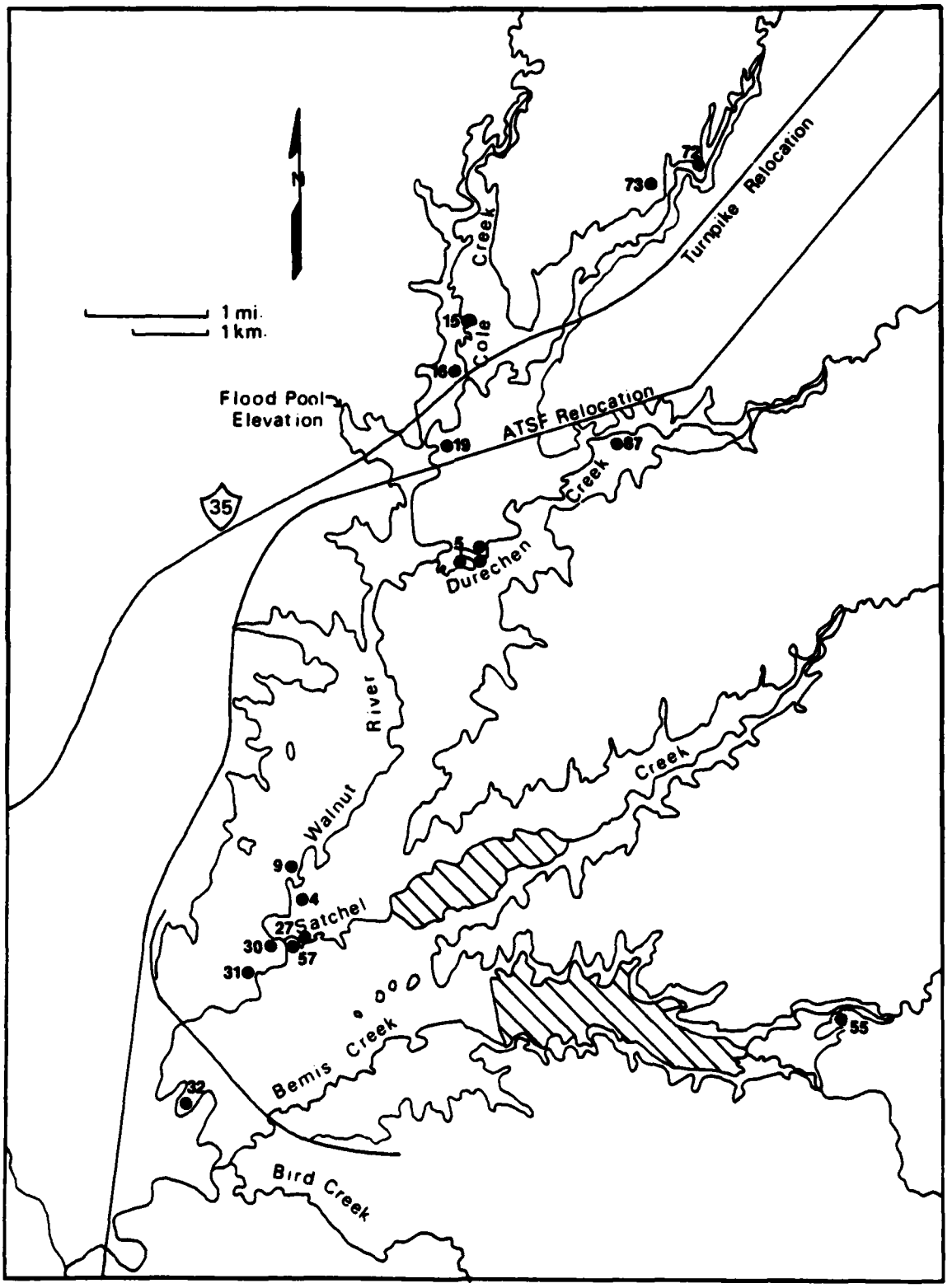
The Archaic cultural historical tradition within the El Dorado resevoir area has been further subdivided into three phases; the Chelsea phase (ca 2650 -

2000 B.C.), the El Dorado phase (ca. 2000 - 1150 B.C.) and the Walnut Phase (ca. 1150- A.D. 1). Based on data obtained from the Snyder site (14BU9) variation in subsistence economy during the Archaic has been recognized, as summarized by Leaf (1979:11). His data suggest that the economy of the Chelsea phase component was based primarily on the exploitation of large mammals and a few small mammals; the economy of the El Dorado phase component was more diversified with large mammals and a large number of small animals and plants being exploited; while the Walnut phase component had an economy based only on the exploitation of large mammals. This apparent oscillation during the Archaic in subsistence strategy, while extremely interesting, is in need of further investigation before it can be adequately evaluated. As noted by Leaf (1979:11) sampling bias, changes in food preferences, functional differences among components, changes in procurement technology and climatic fluctuation are all factors which could account for these variations.

Prior to 1980, archaeological investigations of Woodland occupation sites within the lake area included testing or large-scale excavation of 12 sites (Fig. 1.1). These investigations include block excavations at the Snyder site, 14BU9 (Grosser 1971; Leaf 1981), the Nuttal site, 14BU4 (Fulmer 1976), the Holderman site, 14BU19, (Fulmer 1976) and the Two Deer site, 14BU55 (Adair and Brown 1981; Fulmer 1977). Restricted test excavations at 14BU27, 14BU30, 14BU31 and 14BU57 were undertaken in 1977, and 14BU57 received more extensive excavation in 1979. Test excavations carried out during 1978 investigated 14BU16 and 14BU87 while 14BU15 and 14BU32 were tested in 1979. Bastian (1979) tested 14BU5B in 1968. A brief summary of the more salient characteristics of the Woodland cultural-historical period within the El Dorado Lake area follows (Adair, personal communication). In general, the Woodland period at El Dorado is characterized by sites which vary widely in overall size and artifact assemblages. Most of the sites are located in low-lying areas, primarily on the first terrace

FIGURE 1.1

Woodland archaeological sites investigated
at El Dorado Lake.


1 mi.
1 km.
Flood Pool Elevation
Turnpike Relocation
ATSF Relocation
Cole Creek
Durechen Creek
Walnut Creek
Walnut River
Satchel
Bemis Creek
Bird Creek
35
73
15
16
19
67
5
9
4
27
30
57
31
55
32

of the Walnut River or one of its tributaries. A hunting and gathering mode of subsistence apparently predominated, based on the exploitation of several resource zones. Horticulture, exhibited by the presence of corn and squash, has only been documented at 14BU55, the Two Deer site, which is chronologically late in the known Woodland sequence of the El Dorado area (Table 1.1).

Ceramics recovered from Woodland sites, within the project area are predominately cordmarked conical vessels, which have been compared to Harlan Cord-roughened (Fulmer 1977). A wide variety of nonplastic materials or tempers were added to the clay during manufacture, including limestone or indurated clay at 14BU9, 14BU19, 14BU56, and 14BU31, sand at 14BU27 and 14BU30, and primarily bone at 14BU55. The presence of zoned and dentate stamped ceramics from 14BU9 indicates an affiliation with Kansas City Hopewell ceramics to the northeast (Leaf 1979).

Intra-site and inter-site variability in Woodland projectile point styles is apparent. 14BU9 has Gibson and Snyder points, which are indicative of Hopewellian influence, and smaller Scallon and Sequoyah points. 14BU19 exhibits both larger dart and smaller Scallorn points, which presumably functioned as arrow armaments. 14BU55, 14BU4, and 14BU56 are represented by small triangular corner notched points very similar to the Scallorn type. Based on the relative sizes of these points it can be inferred that both the atlatl and bow and arrow were utilized during the Woodland period within the El Dorado Lake area (Fenenga 1953; Thomas 1978).

1980 INVESTIGATIONS

Specifically this report describes the sub-surface testing of three previously-recorded archaeological sites within the El Dorado Lake area: 14BU72, 14BU73, and 14BU5 areas A, B & C (Figure 1.1). 14BU72 and area B of 14BU5 were previously assigned to the Woodland cultural-historical period, while areas A and C of 14BU5 and 14BU73, were of unknown cultural affiliation

Table 1.1. Radiocarbon dates from Woodland sites in the El Dorado Lake area (based on a half-life of 5568 years). From Artz, In Preparation.

Lab Number	Site	Context	Radiocarbon Years B.P.	Calendar Date (Uncorrected)
*UGa-2561[c]	14BU9	Composite sample from flotation	520 ± 55	A.D. 1430
*UGa-3044[a]	14BU32	XU103/XU104 (composite sample)	720 ± 70	A.D. 1230
UGa-1347[d]	14BU71	Feature 2 (limestone-filled pit)	740 ± 75	A.D. 1210
UGa-3137[e]	14BU57	Excavation Unit 5 (composite sample)	755 ± 235	A.D. 1195
UGa-1345[d]	14BU55	House 1	890 ± 60	A.D. 1060
UGa-2504[b]	14BU55	1 m^2 excavation unit (composite sample)	950 ± 135	A.D. 1000
UGa-1346[d]	14BU55	House 1	970 ± 80	A.D. 980
UGa-2501[b]	14BU55	Feature 18 (charcoal concentration)	984 ± 45	A.D. 965
UGa-2500[b]	14BU55	Feature 6 (charcoal concentration)	1065 ± 65	A.D. 885
UGa-2503[b]	14BU55	Feature 19 (post mold)	1090 ± 55	A.D. 860
UGa-2560[f]	14BU31	Feature 302 (limestone-filled pit)	1215 ± 55	A.D. 735
UGa-2807[c]	14BU31	Feature 304 (limestone-filled pit)	1240 ± 75	A.D. 710

*Dates rejected because of recency or stratigraphic inversion.

[a]Leaf and Root 1981; [b]Adair and Brown 1981; [c]unpublished; [d]Fulmer 1977; [e]Brown 1981; [f]Root 1981.

at the time of the 1980 investigations (Fulmer 1977; Bastian 1979; Root 1978). These sites were selected for test excavation in an effort to expand the current knowledge of the Woodland cultural historical tradition within the project area. The excavations were designed to provide data capable of filling some of the gaps in the cultural chronology of the project area. An examination of Table 1.1 will illustrate that at present there are no known Early Woodland sites within the El Dorado Lake area. The time period of A.D. 1-500 is conspicuously absent, leaving a 500 year void in the cultural chronology. In an effort to narrow this gap in our present knowledge of the developmental stages of the Woodland cultural manifestations within the El Dorado Lake area, the testing of prehistoric archaeological sites undertaken in 1980 concentrated primarily on sites of known Woodland cultural affiliation.

FIELD METHODOLOGY

The Phase IV prehistoric archaeological test excavations at El Dorado Lake were completed under the direction of the author by a small but dedicated crew consisting of John Eads, Judy Muck, and Jerry Wagner. The field work was performed between July 28 and August 20, 1980 under adverse climatic conditions during which temperatures routinely topped 100° F. While the procedures outlined below were employed during the course of the 1980 field season, it should be noted that each of the sites presented different problems which required modification to the basic field strategy employed.

The three basic goals of the 1980 prehistoric testing program were: 1) to delimit the horizontal and vertical extent of each site; 2) to record the cultural and natural stratigraphic units within each site; and, 3) to identify the cultural affiliation of the archaeological component or components represented by the material recovered. The field methodology employed during the 1980 field season was designed to facilitate the attainment of these goals within the limited time available. All of the sites selected for testing had

previously been recorded and surface collected during prior research within the El Dorado Reservoir by the Museum of Anthropology (Bastian 1979; Fulmer 1977; Leaf 1979; Root 1978). Rather than spend additional time surface collecting each of the sites, attention was focused on ascertaining site boundaries and intra-site concentrations of artifacts. To facilitate this basic aim a pedestrian reconnaissance of the surface of each site was undertaken and surveying lathes or stakes were placed adjacent to each of the artifacts encountered on the surface of the site. The outer edge or perimeter of these stakes was then used as an indication of the horizontal extent of the site. In addition all recognized tools found on the surface were mapped by their east-west, north-south and elevation coordinates in an effort to delineate areas within the site boundaries where concentrations of tools occurred. From this information, the selection of specific areas of the sites in which to place 1.0 x 1.0 m. test pits was determined.

In order to map site boundaries and intra-site tool densities, a coordinate system or grid was established for horizontal control. East-west and north-south base lines were laid out using a transit and a stadia rod. This was accomplished by calculating true North from Magnetic North, laying the north-south baseline and turning a 90^{o} angle to lay the east-west baseline. An origin point, designated E500, N500, established the Cartesian coordinate system and horizontal provienience for each artifact and test pit. Monument hubs (2 by 2 inch wooden stakes) were placed within tree or fence lines for protection in the event that future researchers need to reestablish the grid. The origin point can be located by simple triangulation from the monument hubs with reference to the field notes. Vertical provenience of artifacts was determined by means of an arbitrary datum point, designated 10 meters below datum. All test pits and plotted artifacts were then recorded vertically in relation to the datum point. A site map illustrating the estimated site boundaries, the locations of test excavations and monument hubs was made for each site. These maps illustrate

topographic relief in feet above sea level.

At least three 1.0 x 1.0 m. test units were placed within the boundaries of each site. Given that we were attempting to gather data on the cultural affiliation of the components excavated, the test pits were located primarily within areas where artifacts were concentrated on the surface of the site. Test units were numbered sequentially, as well as being identified by the east-west and north-south coordinates of the southwest corner. The 1.0 x 1.0 m. test units were hand excavated using shovels and trowels. In the absence of discernable natural or cultural stratigraphic relationships, the test units were excavated in arbitrary 10 cm. vertical levels measured from the surface elevation of the southwest corner of the unit. An Excavation Record-Level Summary form was completed for each 10 cm level of each one by one meter test unit excavated. These forms were used to record the description of sediments, stratigraphy, artifacts recovered, features present, special samples taken, and photographs taken, and served as the primary means of recording data. A 17.5 liter sample of matrix was taken from the center of each 10 cm level below the plow zone for flotation or water screening. The rest of the matrix from each level, including the plow zone, was mechanically screened through a ¼ inch (6.35 mm) hardware cloth. At the completion of each 1.0 m. x 1.0 m. test pit, a vertical profile of the unit was completed. In addition to the 1.0 x 1.0 m. test units placed within each site's boundaries, additional excavation techniques were employed at each site to assist in locating site boundaries and to determine if deeply buried cultural components were present. These included the use of a backhoe at 14BU72 and 14BU73, the use of manual and mechanical post hole diggers at 14BU5 B, and the use of shovel cuts at 14BU5 A and C. At the completion of the test excavations all test units and backhoe trenches were backfilled.

LABORATORY PROCEDURES

After completion of the field work all of the materials recovered from the 1980 prehistoric test excavation were transported to the Museum of Anthropology at the University of Kansas for laboratory analysis and curation. The laboratory analysis was performed by Judy Muck and the author during the fall of 1980 and the spring 1981. All materials were first washed and then sorted into categories based on material types, such as limestone, chert, sandstone, quartzite, etc. Analysis of each of these material types resulted in further subdivision of the archaeological assemblage recovered from each of the sites into more specific artifact types.

The absence of ceramic material and the lack of any recognizable floral or faunal remains within the sample of artifacts recovered during the 1980 testing program dictates that the artifact analysis be primarily concerned with lithic materials. The analysis of the lithic material closely follows analytical procedures employed by Artz (1981) in his report on the prehistoric sites tested within the El Dorado Reservoir area in 1978. This analytical procedure should provide an insight into the lithic manufacturing technology adopted by the prehistoric inhabitants of each site tested. The procedure should also facilitate future comparative studies of the prehistoric sites tested in 1980 with those tested by Artz (1981) in 1978.

A four stage model of the manufacture of lithic tools is employed to characterize the lithic technology employed by the inhabitants of each of the sites. The four stages of the model are:

"1) The initial reduction of unaltered chert or raw material;

2) the intermediate reduction of the products of the initial reduction;

3) the final shaping of selected pieces into utilizable forms; and

4) the subsequent maintenance or reshaping of those forms." (Artz 1981:57).

The lithic material recovered from each of the sites is related to the four stages of the model by classifying individual specimens into operationally-defined categories or technoclasses. Following Artz (1978:57), technoclasses are interpreted here as the by-products and end-products of the technological processes enacted by prehistoric peoples in manufacturing usable tools from unaltered chert, and in the subsequent use or maintenance activities of those manufacturers. The technoclasses employed in the present analysis are nearly identical to those described by Artz (1981:58-61) and are redefined below. These technoclasses are related to the four stage model of lithic manufacture outlined above in an attempt to characterize the range of behaviors, or activities, carried out by the prehistoric inhabitants of each of the sites tested.

Utilized or tested raw materials are pieces of chert which represent the procurement and initial reduction of unaltered raw materials. In either case modification is restricted to the removal of a few flakes, with those forming a functional edge classified as utilized and those with no functional edge classified as tested.

Cores can be manufactured from unaltered raw material, in which case they exhibit cortical surfaces; or from an intermediate stage of reduction, in which case they are more carefully prepared. In either case they are recognized by the presence of well-defined negative flake scares identifying the presence of one or more prepared platforms from which the flakes were struck.

Flakes are classified into one of three technoclasses; decortication flakes, intermediate flakes, and bifacial trimming flakes. They all share the basic morphological attributes of conchoidal fracture on their ventral

surface, including bulbs of percussion, striking platform remnants, flake ripples, or waves, and hinge fracture termination. These are illustrated in Crabtree (1972).

Decortication flakes are defined by the presence of cortex, the naturally weathered surface of the original raw material, on 50% of the dorsal surface of the flake. Decortication flakes indicate that the initial reduction of relatively unaltered raw material was actively performed at the site.

Bifacial trimming flakes, in contrast, represent the maintenance or manufacture of bifacial tools and are thus characteristic of the third and fourth stages of the generalized lithic reduction sequence discussed above. These flakes are easily recognized by a multifaceted striking platform, which forms an acute angle with the dorsal surface of the flake and "overhangs" or "lips over" the flake's ventral surface. This juncture of the platform and the dorsal surface represents the edge of the bifacial tool from which the flake was struck (Artz 1981:58; Crabtree 1972:94).

Intermediate flakes are flake specimens which are not classifiable as either decortication flakes or bifacial trimming flakes. They are representative of the intermediate or second stage of the lithic reduction model. These intermediate flakes are not further subdivided in this analysis.

Blocky fragments of chert not classifiable as either flakes or cores comprise the category or technoclass of chunks. These are further subdivided into cortical chunks which represent the initial stage of reduction, and non-cortical chunks which represent the intermediate stage of reduction.

The technoclass of shaped tools consists of artifacts which are the product of the trimming of selected chert blanks into utilizable forms. These tools are further subdivided by their basic morphological attributes into categories such as projectile points, scrapers, drills, etc.

The chert resources recovered from the sites tested during the 1980 field season were also classified by chert type according to the classification scheme devised by Haury (1981) for the chert resources of the El Dorado area. The presence of heat treated or thermally altered specimens was also recorded according to criteria outlined in Crabtree and Butler (1964).

A large amount of limestone was recovered from several of the sites tested. This material has been weighed and sorted. When possible the limestone has been further subdivided into burned and unburned categories. The presence of thermal alterations was recognized by the reddish color of the limestone and its more friable nature. Whether the limestone which has been classified as burnt was purposefully thermally altered by the prehistoric inhabitants of a site, or by natural processes, could not be determined.

14BU72

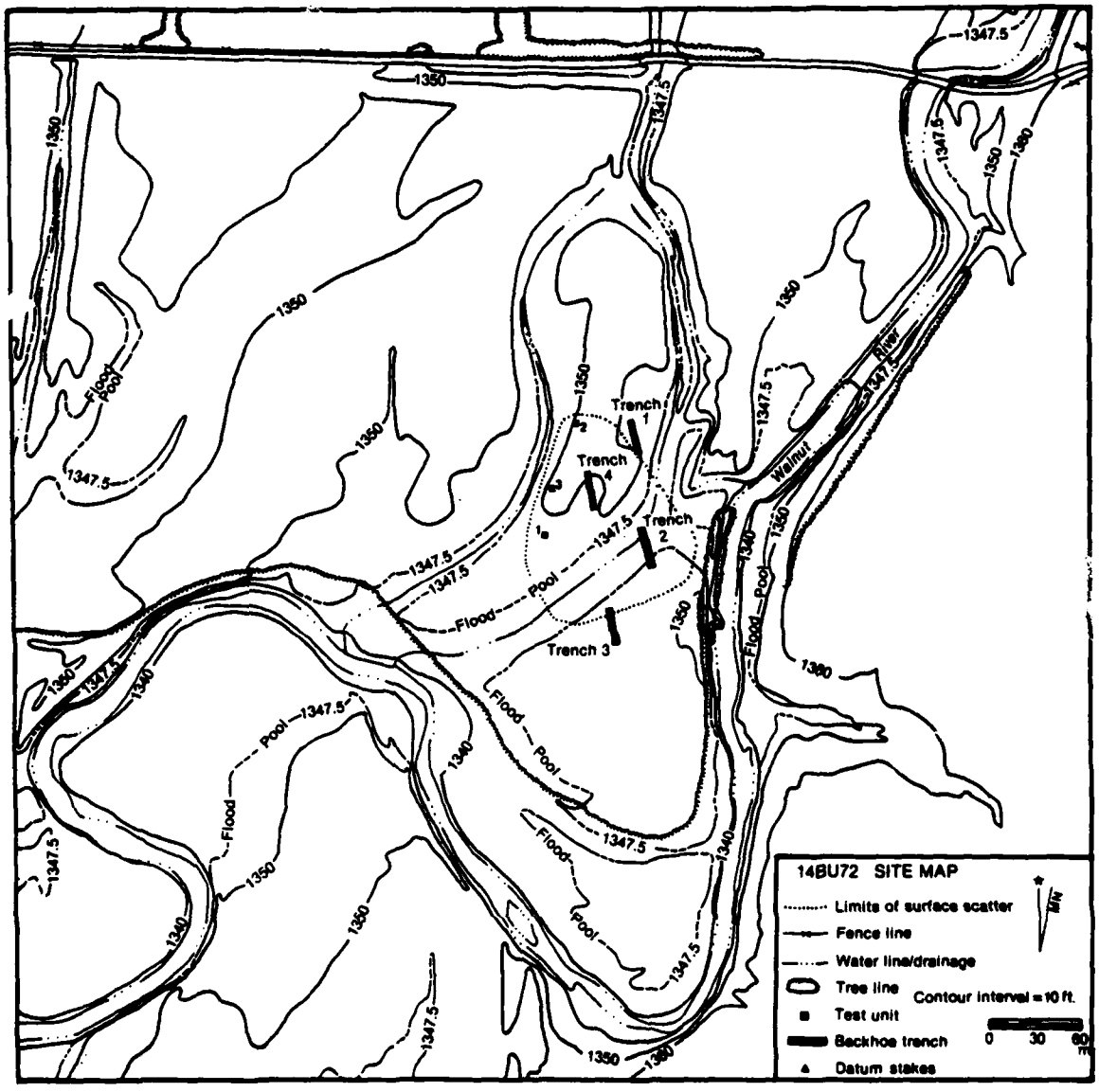
PHYSICAL DESCRIPTION

14BU72 is located near the northern boundary of the project area approximately 60 meters east of the right (west) bank of the Walnut River (Figure 1.1). The site is situated at the open northern edge of a meander loop of the Walnut River on a slight rise or ridge on the floodplain which is transected by two intermittent streams (Figure 1.2). These streams run from northeast to southwest across the site and empty into the Walnut River channel.

The site was recognizable in the field by the surface debris which was found to be largely confined to the top of the ridge. At the time test excavations were undertaken the site was in milo and surface visibility was fair, estimated to be between 25 and 50 percent (see Root 1979:32 for an explanation of the surface visibility descriptions for the El Dorado Reservoir project). Given the heavy trees presently located to the south of the site, at the base of the meander loop, it is probable that the site was forested prior to modern cultivation.

FIGURE 1.2

Topographic map of 14BU72 and vicinity.


14BU72 SITE MAP
Limits of surface scatter
Fence line
Water line/drainage
Tree line
Test unit
Backhoe trench
Datum stakes
Contour interval = 10 ft.
0 30 60 m
Trench 1
Trench 2
Trench 3
Trench 4
Flood Pool
Walnut River
1347.5
1350
1340
1360

The west bank of the Walnut River is much steeper and grades into the uplands. This land is currently in pasture for cattle grazing and is best characterized as an upland prairie grassland.

As noted, 14BU72 lies at the northern edge of the project area. The relationship of the site boundaries, as here defined, to the floodpool elevation of the proposed El Dorado Reservoir is illustrated in Figure 1.2. This map indicates that only during periods of flooding will the site be directly adversely impacted by the dam construction since at all other times the site will be situated well above the conservation pool of 1339 feet. Even when the reservoir is raised to floodpool stage at 1347.5 feet most of the site will not be innundated. The major impact will be from shoreline erosion caused by the filling of the intermittent streams during flood stage. Other potential disturbances to the site exist in the form of illegal artifact collecting and future recreational activities given the sites close proximity to the section road.

The soil within which 14BU72 is located has been designated as Verdigris Silt Loam by the Soil Survey of Butler County, Kansas (U.S.D.A. 1975). This soil type consists of deep, nearly level and gently sloping, moderately well drained soils on bottom lands which formed in loamy alluvial sediment. According to Drew (1981:28-33) the Verdigris soil series, along with the Vanoss and Brewer soil series within the El Dorado Reservoir area, developed as Holocene alluvium. He postulates that the upper 50 cm. of these soil series have developed as recently as 2000 years B.P. with the uppermost 25 cm. developing as recently as 1000 years B.P. (Drew 1981:33). If this estimate of the sedimentation rate within the El Dorado Lake Project area is proved to be accurate it will greatly aid in the chronological ordering of the archaeological components within the area. However, I want to emphasize that

it will be necessary to test Drew's hypothesis with additional radio-carbon dates before it can be employed as a relative dating method within the project area as has been done successfully within the Copan Reservoir area of northeast Oklahoma (Farley and Keyser 1979).

ARCHAEOLOGICAL INVESTIGATIONS

Site 14BU72 was first recorded in 1975 by personnel from the Kansas University Museum of Anthropology (Fulmer 1977; Root 1978; 1979). A large collection of 373 artifacts was recovered from the surface of the site during the 1975 field season. From this sample of artifacts 26 finished tools have been illustrated and described by Fulmer (1977:76-82) including 2 projectile points, 1 drill, 2 bifacially flaked knives, 4 large bifaces, 6 chert celts, 1 unifacial knife, 3 endscrapers, 1 sidescraper, 2 notches, 1 unifacially flaked chopper and 3 core/hammerstones.

14BU72 was revisited by personnel from the Museum of Anthropology during the 1977 field season, and an additional grab sample of surface materials was recovered (Root 1979). This sample has not been incorporated into the present analysis.

Based on the presence of a large corner notched, convex sided projectile point recovered from the surface, 14BU72 has been assigned a Woodland cultural affiliation. The density and large area of surface scatter, approximately four hectares, led Root (1978:21) to speculate that the site may represent the presence of a former Woodland village. Based on these findings 14BU72 was recommended for test excavations to formulate proper protective measures of this cultural resource (Root 1979:71).

The 1980 test investigations at 14BU72 were initiated by a pedestrian surface reconnaissance of the milo field within which the site was located according to site survey records (Root 1978). The density of artifacts

encountered on the surface of the site proved to be much less concentrated than was originally expected given the large quantity of surficial material recovered by Fulmer (1977) and the continuing agricultural practices at the site. Even though the surface visibility was only estimated at 25 to 50 percent, a great deal of effort was expended to locate artifacts in an effort to define the horizontal limits of the site.

The site boundary, illustated in Figure 1.2, is best viewed as an approximation of the actual site boundaries as the site may extend further to the north. However, shovel cuts placed within this area failed to produce any artifacts indicative of a prehistoric occupation.

The test excavation at 14BU72 consisted of three 1.0 x 1.0 m test pits and four 25.0 m. long backhoe trenches placed within or adjacent to the boundaries of the site. The three test pits were placed along a north-south axis in an attempt to assess the depth and areal extent of the cultural deposit as well as to help determine the effects of the erosion along the intermittent stream.

Test Pit 1 was located at the center of the ridge which is bounded by the two intermittant streams. It was placed within an area of relatively high surface debris (an area of 7 small chert flakes). The placement of the test pit was made to assess the subsurface characteristics of the cultural deposit in an area of the site which was not affected by any obvious erosion from the intermittent streams.

Test Pit 2 was placed 80 meters north of Test Pit 1 within an area of extremely low surface density. The presence of a single tool five meters to the east was the only surficial evidence that the site extended this far north.

Test Pit 3 was located 50 meters south of Test Pit 2 adjacent to the intermittent stream which forms the western boundary of the ridge on which

the site is located. Although artifact density within the vicinity of the Test Pit 3 was relatively low it was so placed in an attempt to assess the effect of the intermittent stream channel erosion on the cultural deposit.

SITE STRATIGRAPHY

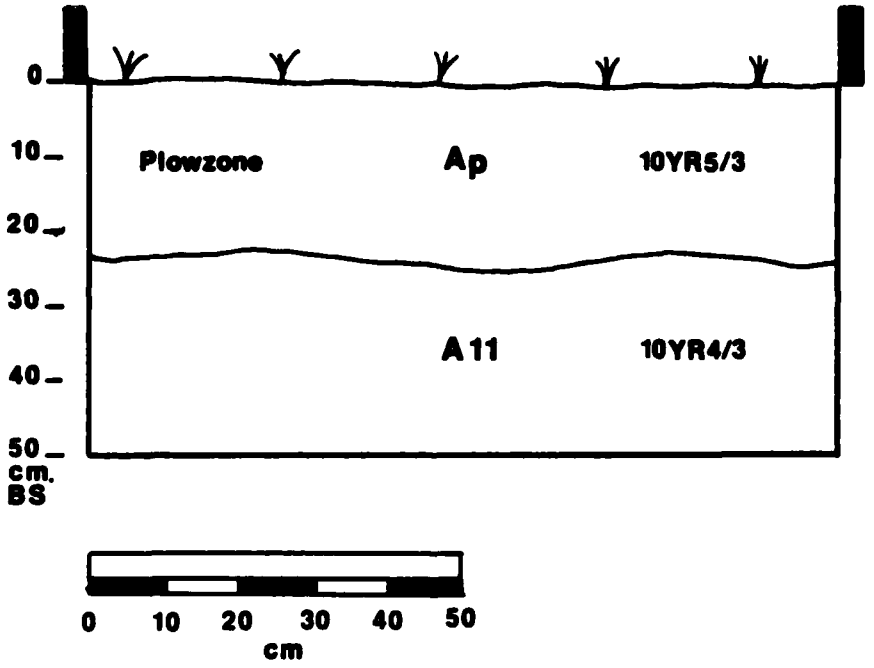
Test Pit 1, located at the center of the ridge on the Walnut River floodplain, was excavated in arbitrary 10 cm vertical levels (below the plowzone) to a depth of 50 cm. below the present ground surface. The plowzone was removed as a single 20 cm. level. The stratigraphic profile of the unit is illustrated in Figure 1.3. It corresponds well with that of the typical Verdigris Series soil profile as described and illustrated by the U.S.D.A. Soil Survey (1975:21). The upper 20-24 cm. consists of the plowzone, a loose alluvial sediment which is brown (10YR5/3) in color. The plowzone is underlain by a dark brown (10YR4/3) silty clay loam A11 horizon which is slightly mottled at the base of the unit with dark gray (10YR4/1) silty clay loam.As demonstrated in Table 2 the majority of the cultural deposit is confined to the plowzone. In addition, the fact that the majority of artifacts encountered within the 20-30 cm. level were recovered from the upper 5 cm. indicates that little if any intact cultural deposit remained undisturbed by agricultural activities on the site. The three artifacts found below 30 cm. of the present ground surface are small chert chips which measure less than 2 cm. in maximum dimension. Thus it is highly probable that these small specimens worked their way down into the soil by natural rather than cultural processes.

Test Pit 2 was placed at the northernmost edge of surficial debris as noted above. The unit was excavated in arbitrary 10 cm. levels below the plowzone to a depth of 50 cm.; the plowzone was removed in a single 20 cm. level. The stratigraphic profile of Test Pit 2 does not significantly differ

FIGURE 1.3

Stratigraphic profile of test pit 1, 14BU72.

14BU72 TEST PIT 1
STRATIGRAPHIC PROFILE



from that of Test Pit 1 and consequently is not illustrated here. However, a post hole auger, 18 cm. in diameter, was used to place a 50 cm. deep post hole in the center of the base of the unit to test for the presence of a buried culture deposit. No artifacts or significant changes in the soil stratigraphy were noted within the excavated post hole.

The distribution of artifacts by level in Test Pit 2 reveals, that as in Test Pit 1, the cultural deposit is confined almost entirely to the plowzone (Table I.3). The only artifact recovered below 20 cm. of the present ground surface is a small fragment of unburned limestone weighing 3.5 grams. This artifact probably migrated downward from the rodent activity which was noted throughout all levels of the unit in the form of stains indicating the former presence of rodent burrows.

Test Pit 3 was placed adjacent to the bank of the westernmost intermittent stream in an area where slope runoff and erosion appeared to be greatest. The unit was excavated in arbitrary 10 cm. levels below the plowzone to a depth of 40 cm. The plowzone was removed as a single 20 cm. level.

The stratigraphy of Test Pit 3 is nearly identical to that of test pits 1 and 2; with nearly all of the cultural material occuring within the plowzone (Table 1.4). The only artifacts encountered below the plowzone are a small chert chip which measures less than 2 cm. in maximum dimension and two small unburned limestone fragments with a combined weight of less than 5 gms. The small size of these artifacts and the presence of rodent activity within the unit indicates that these artifacts migrated downward due to natural rather than cultural processes. A post hole, 18 cm. in diameter, was excavated at the base of the unit to a depth of 1 meter below surface. No artifacts or stratigraphic evidence of a buried cultural deposit were encountered within the auger test.

Table 1.2 14BU72 Vertical distribution of artifacts in test pit 1

Level	Number
Plowzone (0-20) cm BS	33
20-30 cm BS	14
30-40 cm BS	2
40-50 cm BS	1

Table 1.3 14BU72 Vertical distribution of artifacts in test pit 2

Level	Number
Plowzone (0-20) cm BS	14
20-30 cm BS	0
30-40 cm BS	1
40-50 cm BS	0

Table 1.4 14BU72 Vertical distribution of artifacts in test pit 3

Level	Number
Plowzone	15
20-30	1
30-40	2

Table 1.5 14BU72 Combined vertical distribution of test pits 1-3

Level	Number	Relative Percentage
Plowzone	62	75%
20-30	15	18%
30-40	5	6%
40-50	1	1%

Four 25 meter long backhoe trenches were placed within or adjacent to the lithic scatter taken to represent the boundaries of the site (Figure 1.2). These trenches represent an attempt to locate buried cultural deposits within the floodplain sediments of the Walnut River. In addition particular attention was given to the area just below the plowzone of the trenches in an attempt to discover any features which may have been transected by their excavation. Unfortunately no buried cultural deposits or features were encountered.

Trench 1 was placed on the eastern edge of the ridge in a north-south direction within an area of very slight lithic scatter which formed the posited northeastern boundary of the site. The trench ranged in depth from 1.5 to 3.5 meters below the present surface of the ridge. Although the walls of the trench were carefully cut back with a profile shovel and trowels, no cultural material was found below the plowzone. The east wall of the trench was photographed and a profile of the soil stratigraphy was made prior to backfilling the trench.

Trench 2 was placed in the southeastern portion of the lithic scatter on the south bank of the intermittent stream which transects 14BU72. This trench was oriented in a north-south direction and ranged in depth from 1 to 4 meters below the present surface of the intermittent stream bank. While no cultural material was noted within the trench, a lens of small freshwater mussel shell was encountered on the surface of the stream bank which extended from 3 to 5 cm. below the plowzone. The small but uniform size of these bivalve shells, with maximum diameter of 1 cm. indicates a non-cultural origin for their disposition. The absence of any cultural material within the shell lens corroborates this view. Given the close proximity of the Walnut River as a source for these shells they most likely washed onto the site

during periods of flooding, which would account for their presence in the lower portion of the southern bank of the intermittent stream.

The lack of cultural material within Trench 2 is particularly interesting in light of the fact that 5 of the 10 chipped stone tools found on the surface of the site were located within 20 meters to the east of the trench at the crest of the southern bank of the intermittent stream. The absence of cultural material and the presence of the shell lens within the trench indicates that any evidence of a prehistoric occupation which may have existed within this portion of the site has been obliterated by the cutting action of the intermittent stream. Thus data derived from Trench 2 document that the intermittent stream has cut through the site subsequent to its' prehistoric occupation. The east wall of the trench was photographed and a profile was drawn prior to backfilling.

Trench 3 was placed in the south central portion of the milo field south of the edge of the surface scatter taken to indicate the southern boundary of the site. The trench was oriented north to south and ranged in depth from 1 to 4 meters below the present surface of the Walnut river flood plain. No cultural material was found nor were any shell fragments discovered. The absence of any cultural material indicates that the southern boundary of the site is reasonably established by the southern terminus of the surface scatter. The absence of the shell lens, encountered in Trench 2, documents that the shell is confined to the channel of the intermittent stream and does not extend southward to the higher elevation of Trench 3. The east wall of the trench was photographed and a stratigraphic profile was made prior to backfilling.

Trench 4 was placed 60 meters north of Trench 3 in the central portion of the ridge where surface artifact density appeared greatest. It should be

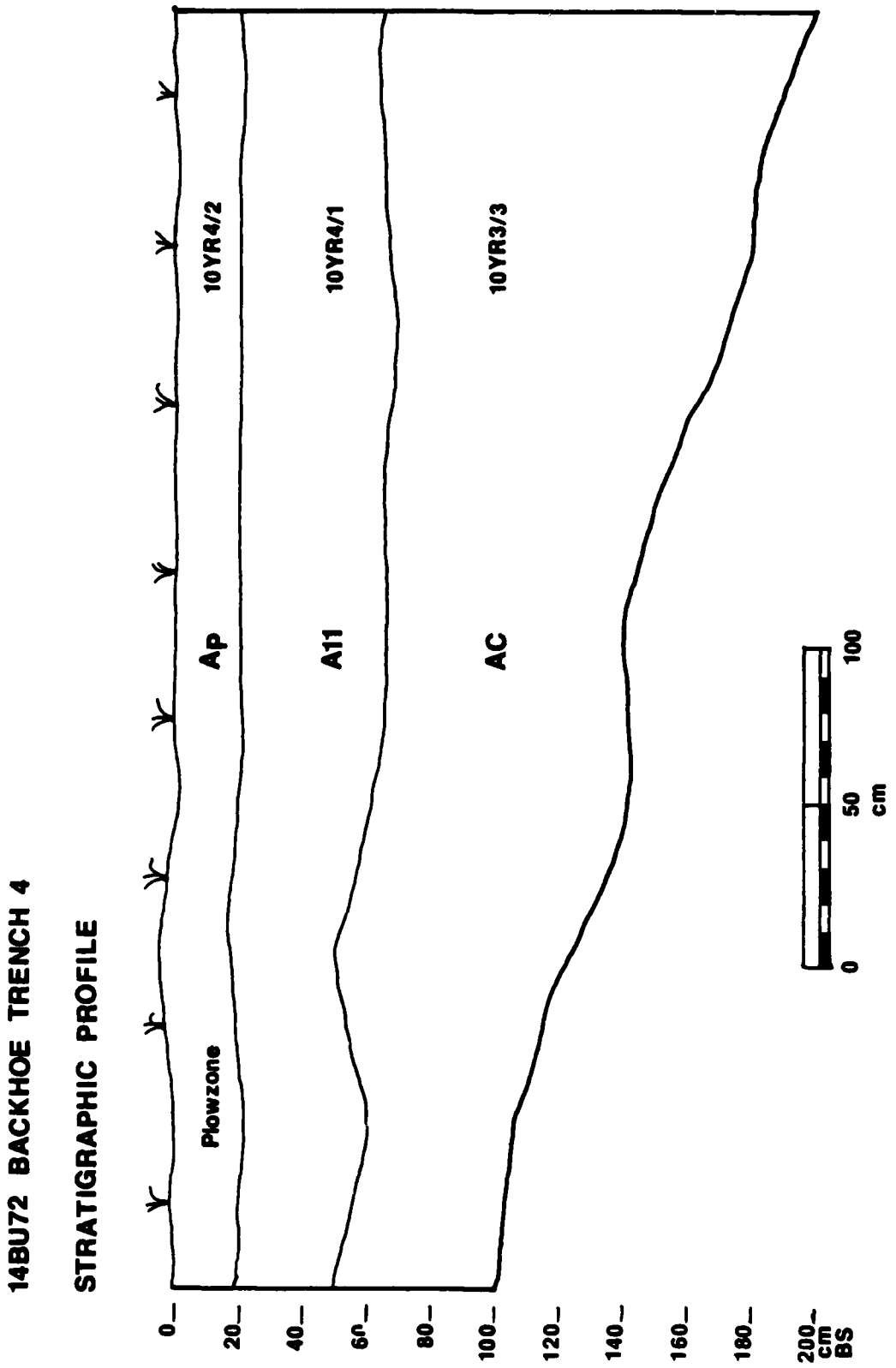
emphasized that the concept of density as used here is relative and unquantified. In actuality the area consisted of a light scatter of lithic debris. The trench was oriented from north to south and ranged in depth from 60 cm. to 4 meters. No artifacts were encountered below the plowzone, even though the southernmost 5 meters of the trench were only taken down to 60 cm. below the surface and carefully trowled back. The east wall of this trench was photographed and profiled prior to backfilling. The stratigraphic profile of Trench 4 is illustrated in Figure 1.4. The stratigraphy is very similar to that of the other three trenches and in general corresponds very well with the Verdigris Soil series as defined and illustrated by the U.S.D.A. Soil Survey (1975:21).

DISCUSSION

While the test excavations at 14BU72 did not yield a large number of artifacts or discover any intact cultural components a few statements regarding the nature of the prehistoric occupation can be made. As expected from the surface scatter the number of artifacts recovered from Test Pits 2 and 3 are fewer in number than the quantity recovered from Test Pit 1 (see Tables 1.2 - 1.4). This difference in artifact density in Test Pit 1 documents that the major locus of prehistoric occupation was, as expected, on the center of the slightly elevated ridge on the Walnut River Floodplain. It also indicates that the southern area of this ridge was more intensively occupied than the northern area of the site. Currently the southern area of this ridge provides the closest proximity to the channel of the Walnut River with its perennial source of water and other aquatic resources. The three test pits also confirm that the cultural deposit at 14BU72 is confined within, or just below the plowzone. Table 1.5 gives the relative percentages and the total number of artifacts located within each level of the three test pits combined.

FIGURE 1.4

Stratigraphic profile of backhoe trench 4, 14BU72.


14BU72 BACKHOE TRENCH 4
STRATIGRAPHIC PROFILE
Plowzone
Ap
10YR4/2
A11
10YR4/1
AC
10YR3/3
0
50
100
cm
0
20
40
60
80
100
120
140
160
180
200
cm
BS

The information derived from the four backhoe trenches proved to be somewhat of a disappointment since no intact sub-plowzone cultural components were encountered. However the backhoe trenches did serve to delimit both the horizontal and vertical extent of the site. The southern boundary of the site was well established with the placement of backhoe trenches 2 and 3. The precise location of the northern boundary of the site is more difficult to establish however since the presence of artifacts at the southern edge of trench 1 and within Test Pit 2 indicate that the site boundary is actually somewhat further north than indicated by the limits of the surface scatter. Shovel cuts, placed to the north and west of the surface scatter, failed to encounter any artifacts within the plowzone. Thus, with the data at hand it is impossible to precisely define the northern boundary of the site. The area of the site is therefore best taken as an estimated minimum of 22,500 square meters, or 2.25 hectares. This area is only a little over 50% of the total area of 4 hectares estimated by Root (1978) to have been occupied prehistorically. The larger and denser scatter of artifacts encountered on the surface of 14BU72 by earlier researchers (Fulmer 1977; Root 1978) best accounts for the differences in the calculated surface area of the site. This discrepancy would seem to indicate that a substantial portion of the site has been removed via the surface collections which are currently curated at the Museum of Anthropology at the University of Kansas.

ARTIFACT ANALYSIS

During the 1980 field season a total of 135 artifacts were recovered from the surface and subsurface of 14BU72. Material types recovered include chipped stone, unworked stone, bone, burned earth, and historic ceramics.

Two small fragments of an historic ceramic vessel were recovered from the plowzone of the site with one located in Test Pit 1 and the other found

in Test Pit 3. While these two fragments do not cross mend they are nearly identical and probably came from the same vessel. Their interior surface is covered by a crackled glaze of olive yellow (5Y6/6) while their interior is coated with a black (5Y2.5/2) glossy glaze. While both sherds appear to be from the shoulder of a vessel they are too small to determine either the vessel form or to calculate the vessel orifice diameter. The larger of these two fragments measures 2.9 mm by 1.8 mm in maximum dimension. The smaller measures 2.1 mm by 1.4 mm in maximum dimension. Both specimens have a maximum thickness of 7.0 mm while their combined weight is 7.5 grams.

As noted above, while these two sherds do not cross mend, they are nearly identical and appear to have come from a single vessel. The possibility does exist that they came from separate but identical vessels. However, the lack of any other historic material, ceramic or otherwise, on the surface of the site mitigates against this possibility since if there were more than one vessel represented other fragments should have been encountered. If these two fragments are in fact derived from the same vessel the horizontal displacement of artifacts at 14BU72, due to farming practices, has been extensive since they were found 30 meters apart in a north-south trending milo row. Thus any attempts at locating intrasite densities of artifacts within the plowzone for the purpose of defining prehistoric activity loci would be extremely suspect at this site.

Two small pieces of burned earth were recovered from the plowzone of Test 1. Their combined weight is 1.0 grams. The fragments are both badly weathered and neither of them exhibit evidence of grass or pole impressions indicative of a prehistoric structure. A natural firing of these specimens can not be discounted based on the evidence available. One small bone fragment, weighing 0.5 grams, was encountered between 40-50 cm. below the surface of Test Pit 1. Although taxonomically unidentifiable it is most likely

the remains of a rodent, given its small size, depth below surface and the presence of rodent runs throughout the unit.

A relatively large amount of unworked stone was recovered from the test excavations of the site including five pieces of gravel weighing 17.6 grams and 46 pieces of limestone weighing 149.9 grams. Only two fragments (2.3 grams) of the limestone appeared to have been thermally altered. Whether the fragments were purposefully fired or were subjected to natural firing can not be determined.

The majority of the limestone (75% by weight) was located within the plowzone. The remaining 25% was located in the 20-30 cm level. Since there is not an equal percentage of limestone present throughout the floodplain deposit, that which is present was transported to the site by the prehistoric inhabitants. How this material was utilized by the prehistoric inhabitants can not readily be determined but the near absence of thermal alteration would seem to preclude its use in stone boiling or hearth construction.

Table 1.6 lists the chert types as well as the presence or absence of thermal alteration for the 78 chipped stone artifacts recovered from both the surface and the three test pits at 14BU72 during 1980. Table 1.7 presents the same data for the sample of 373 chipped stone artifacts recovered by Fulmer (1977) in 1975. While these two collections are essentially combined in the following analysis they are presented in separate tables to facilitate comparisons between them. It should be noted that the finished tools collected in 1975 have already been described by Fulmer (1977:76-82) and are not dealt with here in any detail.

Florence A chert numerically predominated in both the 1975 and the 1980 artifact samples obtained from 14BU72, comprising 58% and 64% of the samples respectively. When the two samples are combined Florence A chert comprises

TABLE 1.6 Chert types and thermal alteration of chipped stone technoclasses recovered from 14BU72 in 1980.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		INDETERMINATE		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORE	-	1	-	-	-	-	-	-	-	1
TOTAL	1		-		-		-		1	
CORTICAL CHUNKS AND SHATTER	1	1	1	-	-	-	1	1	3	2
TOTAL	2		1		-		2		5	
DECORTICATION FLAKES	9	2	-	3	-	-	1	3	10	8
TOTAL	11		3		-		4		18	
INTERMEDIATE FLAKES	11	10	2	4	-	1	-	3	13	18
TOTAL	21		6		1		3		31	
NONCORTICAL CHUNK & SHATTER	3	7	1	2	-	-	-	-	4	9
TOTAL	10		3		-		-		13	
BIFACIAL TRIMMING FLAKES	1	-	-	-	-	-	-	-	1	-
TOTAL	1		-		-		-		1	
SHAPED TOOLS	-	4	1	3	-	1	-	-	1	8
TOTAL	4		4		1		-		9	
TOTAL	25	25	5	12	-	2	2	7	32	46
TOTAL	50		17		2		9		78	

TABLE 1.7 Chert types and thermal alteration of chipped stone technoclasses recovered from 14BU72 in 1975.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		IND/MISC		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORE	1	7	-	6	-	1	-	-	1	14
TOTAL	8		6		1		-		15	
CORTICAL CHUNKS AND SHATTER	-	16	-	4	-	-	8	34	8	54
TOTAL	16		4		-		42		62	
DECORTICATION FLAKES	4	16	1	5	-	2	4	9	9	32
TOTAL	20		6		2		13		41	
INTERMEDIATE FLAKES	39	54	1	21	-	-	1	8	41	83
TOTAL	93		22		-		9		124	
NONCORTICAL CHUNKS & SHATTER	7	15	-	15	1	-	-	6	8	36
TOTAL	22		15		1		6		44	
BIFACIAL TRIMMING FLAKES	11	3	-	1	-	-	-	-	11	4
TOTAL	14		1		-		-		15	
SHAPED TOOLS	6	25	2	7	-	-	-	14	8	46
TOTAL	31		9		-		14		54	
TESTED COBBLES	-	13	-	5	-	-	-	-	-	18
TOTAL	13		5		-		-		18	
TOTAL	68	149	4	64	1	3	13	71	86	287
TOTAL	217		68		4		84		373	

TABLE 1.8 Chert types and thermal alteration of chipped stone technoclasses recovered from 14BU72, combined samples.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		IND/MISC		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORE	1	8	-	6	-	1	-	-	1	15
TOTAL	9		6		1		-		16	
CORTICAL CHUNKS AND SHATTER	1	17	1	4	-	-	9	35	11	56
TOTAL	18		5		-		44		67	
DECORTICATION FLAKES	13	18	1	8	-	2	5	12	19	40
TOTAL	31		9		2		17		59	
INTERMEDIATE FLAKES	50	64	3	25	-	1	1	11	54	101
TOTAL	114		28		1		12		155	
NONCORTICAL CHUNKS & SHATTER	10	22	1	17	1	-	-	6	12	45
TOTAL	32		18		1		6		57	
BIFACIAL TRIMMING FLAKES	12	3	-	1	-	-	-	-	12	4
TOTAL	15		1		-		-		16	
SHAPED TOOLS	6	29	3	10	-	1	-	14	9	54
TOTAL	35		13		1		14		63	
TESTED COBBLES	-	13	-	5	-	-	-	-	-	18
TOTAL	13		5		-		-		18	
TOTAL	93	174	9	76	1	5	15	78	118	333
TOTAL	267		85		6		93		451	

59% of the total sample (Table 1.9) The only core recovered in 1980 is of Florence A chert while 8 of the 15 cores recovered in 1975 are of this material. In addition to these cores, cortical chunks and shatter, decortication flakes, intermediate flakes, bifacial thinning flakes, noncortical chunks and shatter, and shaped tools of Florence A chert are present in both the 1980 and 1975 samples.

Florence B chert is the next most prevalent chert type represented at 14BU72, comprising 18% of the 1975 surface collection and 22% of the sample obtained in 1980. When the samples were combined 19% of the artifacts were categorized as being manufactured from Florence B chert (Table 1.9). While no cores of Florence B were found in 1980, 6 cores of this material type were recovered in 1975. The technological categories represented by Florence B chert are the same as those for Florence A in both samples, with the exception that the 1980 sample lacks both cores and bifacial thinning flakes.

Flint Hills Light Grey, while represented in both samples comprises only slightly more than 1% of the total sample (Table 1.9). Artifacts of this material type include a single core, two decortication flakes, one intermediate flake, one noncortical chunk and a single shaped tool.

The category of indeterminate/miscellaneous chert contains 93 artifacts or 21% of the combined total of both collections. All technoclasses are represented with the exception of cores, tested cobbles and bifacial thinning flakes.

The 18 tested cobbles obtained from 14BU72 in 1975 provide evidence that the initial procurement of raw material was an activity performed by the inhabitants of the site. Thirteen of these cobbles are of Florence A chert, while the remaining 5 cobbles are of Florence B chert. The ratio of Florence A to Florence B chert for the technoclass of tested cobbles is nearly identical to the overall ratio of Florence A to Florence B for the entire assemblage

Table 1.9 Raw material usage at 14BU72

Chert type	1975	1980	Combined
Florence A	219 (58)	50 (64)	267 (59)
Florence B	68 (18)	17 (22)	85 (19)
Flint Hills Lt. Grey	4 (1)	2 (2)	6 (1)
Indet./Misc.	84 (23)	9 (12)	93 (21)
Totals	371 (100)	78 (100)	451 (100)

recovered from the site, and as such it provides a good indication of the relative abundance or cultural preference for chert types. That the prehistoric inhabitants of the site obtained these cobbles from a quarry site, rather than from a stream bed, is indicated by the blocky contours of these cobbles and the lack of a patina indicative of water action. The location or locations of the activity is not known, but the abundance of these two material types suggests that it is in close proximity to the site.

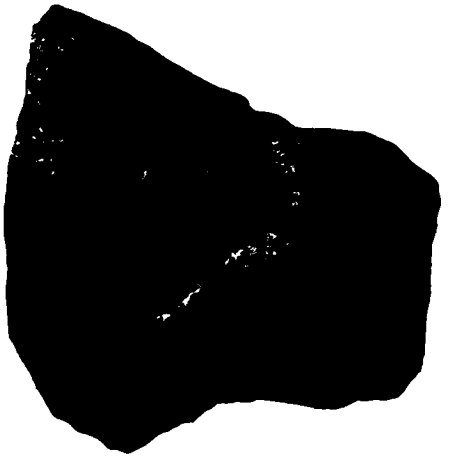
A total of 16 cores recovered from 14BU72 provide ample and direct evidence that the manufacture of flakes was an important technological activity at the site. Nine of the cores recovered are of Florence A chert while 6 of the specimens are of Florence B. The remaining core is of Flint Hills Light Grey chert, a material type not well represented at the site, and apparently not readily available to the prehistoric inhabitants or considered technologically inferior.

The single core recovered during the 1980 investigations at 14BU72 was removed from the surface of the site and is illustrated in Figure 1.5. This specimen is of Florence A chert and weighs 137.9 grams. The core exhibits 2 striking platforms and apparently went through at least two episodes of flake manufacture during its' use-life. Initially flakes were removed from the striking platform visible at the right margin of Figure 1.5B. The presence of cortex on this platform indicates that the initial flakes were removed from a relatively unmodified piece of raw material. This platform measures 38 mm. by 28 mm. in maximum dimensions and is rectangular in shape. Flakes were removed from three of the four edges of the perimeter of this platform.

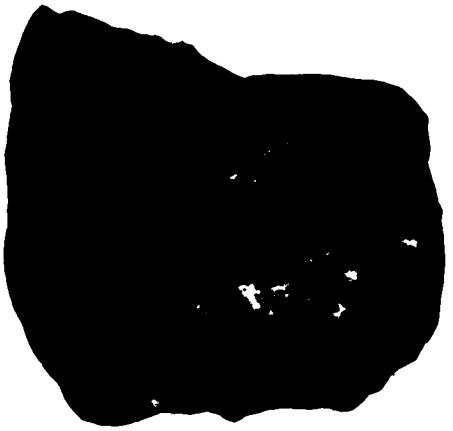
Subsequent reduction of the core occurred as additional flakes were removed from the platform visible at the top of Figure 1.5A. This platform is roughly triangular in shape and measures 34 mm. in maximum length and ranges from 10 mm. to 32 mm. in maximum width. The angle formed between the flake

FIGURE 1.5

Two opposite lateral views of a core from 14BU72.



a



b

0 mm 30

scars and this second striking platform ranges from 78 to 85 degrees. Platform preparation along the margin is visible in the illustration (Figure 1.5A). It is possible that as this second platform narrowed it became too small to effectively strike off anymore flakes and the core was discarded. Figure 1.5B illustrates the opposite surface of the specimen.

The decortication elements at the site, comprised of decortication flakes as well as the cortical chunks and shatter, represent 28% of the combined chipped stone assemblage obtained from 14BU72 in 1975 and 1980. As the figure indicates, the initial reduction of raw material was an important activity at the site. The presence of the 16 cores in conjunction with this large number of decortication elements demonstrates that the cores were prepared on the site rather than being transported to the site after their initial preparation at another locality.

The 155 intermediate flakes and 57 pieces of noncortical chunks and shatter represent 49% of the combined 1980 and 1975 samples. This large quantity of intermediate elements, again in conjunction with the 16 cores, demonstrates that the manufacture of flakes was a primary technological activity at the site.

The 54 shaped tools recovered in 1975 and the 9 recovered in 1980 from the surface of 14BU72 indicate that the object of this prehistoric flake production was the manufacture of chipped stone tools. The small number of bifacial trimming flakes (N=18) recovered from the entire assemblage seems to contradict the conclusion since more of these would have been present if biface production was an important activity. However, it is probable that sample bias accounts for this discrepancy given the small size of these elements and the fact that both samples were almost entirely from the surface of the site.

As shown in Table 1.8, 118 elements which comprise 26 percent of the total assemblage exhibit evidence of thermal alteration. The overwhelming majority, or 93 elements of heat treated material, are of Florence A chert. Only 9 elements of Florence B and a single non-cortical chunk of Flint Hills Light Grey chert were heat treated. An additional 15 elements were heat treated but the chert type could not be determined. The significant preference for heating Florence A chert at 14BU72 indicates that while this material is the preferred chert resource it often required the technological process of heat treatment to render it suitable for utilization by the prehistoric inhabitants (Crabtree and Butler 1964).

Within the Florence A chert type all technoclasses exhibit heat treatment except for tested cobbles. The technoclasses exhibiting the highest ratio of heat treated elements are the intermediate flakes and bifacial trimming flakes. This data indicates that only after a piece of raw material was selected as suitable for prehistoric tool manufacture was it subjected to heat treatment. It can also be inferred that heat treatment was performed at the site rather than at another locality from the absence of heat treatment from only the technoclass of tested cobbles.

Flakes, rather than finished tools, exhibit the highest ratio of heat treated elements at the site. Only 1 of the 16 cores and 9 of the 63 shaped tools appear to be heat treated (Table 1.8). However, the high incidence of heat treatment within the technoclass of bifacial trimming flakes (80% of the Florence A sample) indicates that the absence of heat treated bifaces within the sample of artifacts recovered from 14BU72 is a serious bias in the data. This absence of heat treated bifaces may be the result of prehistoric curation or the effects of historic artifact collectors. In either case, it appears that heat treatment played a more important role in the manufacture of bifaces

than Table 1.8 would indicate.

SHAPED TOOLS

Only the tools recovered during the 1980 field season are described in this report. See Fulmer (1977:91) for a description of the shaped tools recovered from 14BU72 in 1975.

The 9 shaped chert tools found on the surface of 14BU72 in 1980 consist of 1 complete biface, 2 biface fragments, 5 scrapers and 1 hammerstone. An additional hammerstone fashioned of quartzite completes the tool inventory. The chert types of these tools are listed in Table 1.10.

The only complete biface recovered from the surface of 14BU72 in 1980 is morphologically quite distinct from the other tools recovered (Figure 1.6A). It measures 72 mm. in maximum length and 41 mm. in maximum width. The maximum thickness of this tool is 15 mm. and it weighs 37.3 grams. The biface was fashioned from Florence A chert and is subtriangular in shape.

This specimen was retouched along both of the lateral margins. The edge angle of the lateral margins averaged 34^{o}, placing it within the range of edge angles acute enough to infer a function as a cutting implement (Wilmsen 1970:70). While this specimen does not exhibit color change indicative of thermal alteration it does possess cortex on both surfaces. The presence of cortex on both sides of this biface provides conclusive evidence that it was manufactured from a single small cobble of raw material. The shape of the tool, as well as the blunted proximal lateral edges, indicate that it may have been hafted or socketed.

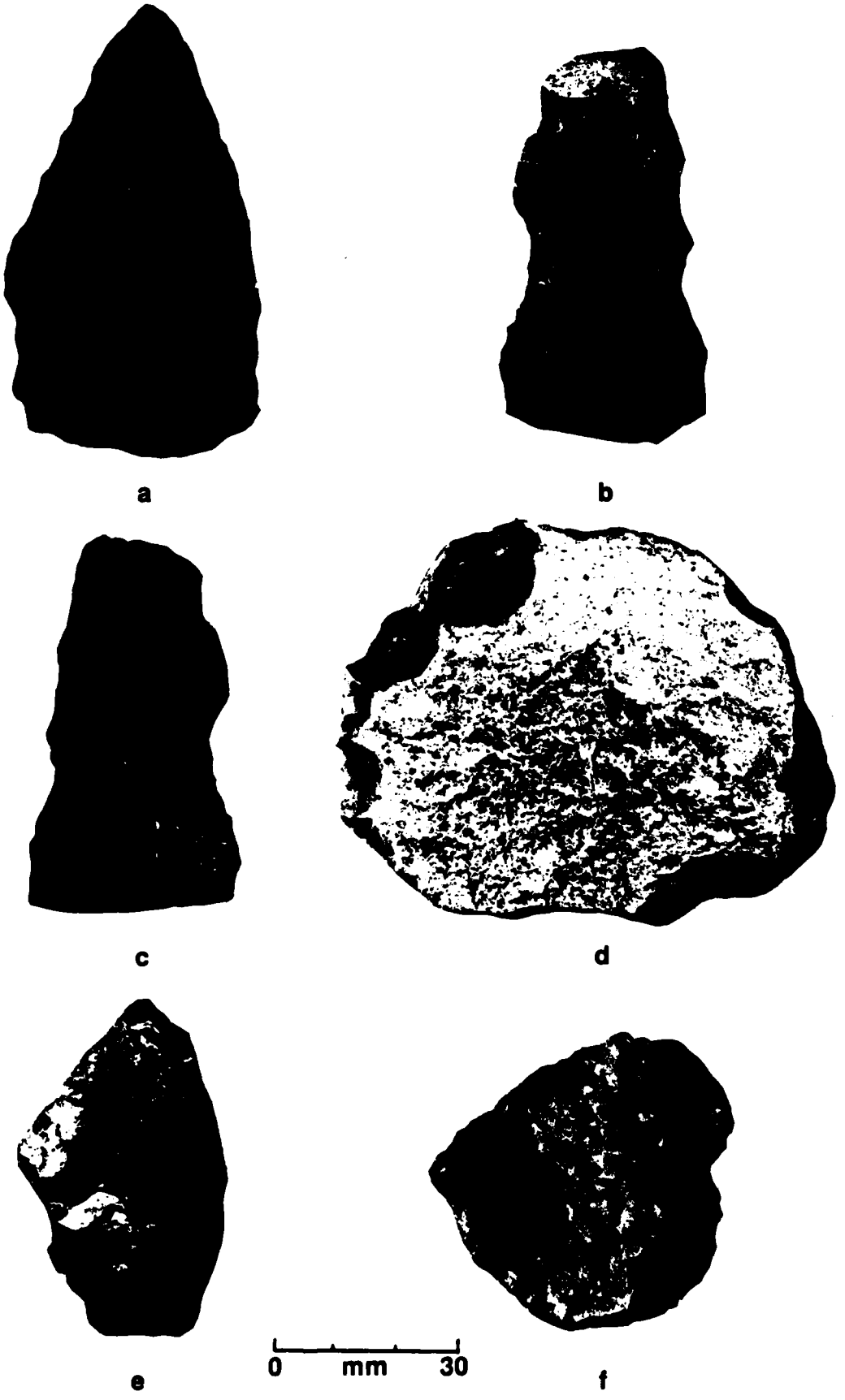
The two biface fragments recovered from the surface of 14BU72 in 1980 are quite dissimilar. The first of these (Figure 1.6B & 1.6C) is the distal end of a relatively thick and narrow biface of Florence A chert. This specimen is completely flaked on both surfaces. Its maximum dimensions are 60 mm length, 33 mm. in width, and 18 mm. in thickness. It weighs 36.6 grams. The edge angle of the

TABLE 1.10 Morphological/functional categories and chert types of shaped tools, 14BU72.

MORPHOLOGICAL/ FUNCTIONAL CATEGORIES	FLORENCE A	FLORENCE B	LIGHT GREY	TOTAL
BIFACE	1	-	-	1
BIFACE FRAGMENT	-	2	-	2
SCRAPER	2	2	1	5
HAMMERSTONE	1	-	-	1
TOTAL	4	4	1	9

FIGURE 1.6

Shaped tools recovered from 14BU72: (A-D) bifaces; (E,F) scrapers.


a
b
c
d
e
f
0
mm
30

lateral edges averages 63° while the angle of the transverse edge is 61°. Both the transverse and lateral edges exhibit evidences of utilization in the form of pronounced crushing and step faceting. Wilmsen (1970:71) postulated that heavy cutting and scraping activities are tasks which are suited for tools with edge angles within this range.

The second biface fragment is also a distal fragment although it is considerably smaller than the one described above. Its maximum dimensions are 25 mm. in length, 21mm in width and 18 mm. in thickness. It weighs 5.8 grams and was manufactured from heat treated Florence B chert. While the fragmentary nature of this specimen made edge angle measurement difficult, the retouch along the working edge varies from 40 to 76 degrees. These edge angles and the crushing and rounding of the working edge suggest that it functioned as a scraping implement.

Four of the five scrapers recovered from the surface of 14BU72 were fashioned by the placement of steep retouch on the transverse edge of a flake (see Figures 1.6E and 1.6F).

One of these four scrapers is the only tool recovered in 1980 which is made of Flint Hills Light Grey chert. Its maximum dimensions are 31 mm. in length, 27 mm. in width, and 7.2 mm. in thickness. It weighs 7.2 grams. The steeply retouched transverse edge of this tool averages 78 degrees placing it well within the range of scraping tools discussed by Wilmsen (1970:71).

Figure 1.6E illustrates one of the two scrapers manufactured from Florence B chert. This view is of the ventral surface of the tool and the transverse working edge is visible at the top of the illustration. The transverse edge angle measures 70 degrees, which is suitable for scraping activities. The maximum dimensions of this scraper are 32 mm. in length, 55 mm. in width, 10 mm. in thickness and 18.2 grams in weight.

The second of the two scrapers manufactured from Florence B chert is very similar to the one described above although it is smaller in size. This specimen measures 16 mm in length, 18 mm. in width, 8 mm. in thickness and 1.5 grams in weight. The transverse edge of the dorsal surface of this small tool has been retouched to an angle of 63° degrees.

One of the two scrapers manufactured from Florence A chert recovered during 1980 is illustrated in Figure 1.6F. The view is of the dorsal surface of the artifact and the working edge is visible at the upper left hand portion of the illustration.

This specimen measures 41 mm. in length, 44 mm. in width and 13 mm. in thickness. It weighs 23.1 grams. The placement of steep retouch along the transverse margin of this tool yielded an edge angle of 71 degrees, which, as already noted, is suitable for scraping activities. This tool also was found to exhibit step faceting or edge crushing along the working edge.

The remaining scraper recovered from the surface of 14BU72 in 1980 is illustrated in Figure 1.6D and is of Florence A chert. Unlike the four scrapers described above, which were manufactured by the placement of steep retouch along the transverse margin of an intermediate flake, this tool was manufactured from a decortication flake and was steeply retouched along the lateral margins. In Figure 1.6D the view is of the dorsal surface, and the cortex can be readily distinguished from the retouched transverse margins. These margins possess an average edge angle of 55 degrees. This is within the range of edge angles Wilmsen (1970:70) inferred suitable for skinning and hide scraping; sinew and plant fiber shredding; heavy cutting of wood, bone, or horn; and tool back blunting. The tool measures 61 mm. in length, 82 mm. in width, 20 mm. in thickness and 123.4 grams in weight.

Two hammerstones were recovered in 1980 from the surface of 14BU72. One is of Florence A chert and is illustrated in Figures 1.7A and 1.7B. Crushing, rounding, and pockmarks, presumably resulting from hammering or pulverizing activities, are visible on both surfaces of the tool. The presence of cortex (visible in Figure 1.7A) indicates that this tool was utilized initially from a relatively unaltered piece of raw material. Some flakes were removed from the hammerstone as can be determined by the negative flake scars visible on both surfaces. No well prepared striking platform is evident, however, and it is probable that these flakes were detached as the result of its use as a hammerstone rather than as a core. This tool measures 54 mm in maximum length, 49 mm. in maximum width, 34 mm. in maximum thickness, and weighs 137.9 grams.

The second hammerstone recovered from the surface of the site in 1980 is illustrated in Figure 1.7C. This specimen was fashioned from a small rounded cobble of quartzite which is most likely a glacial erratic. The extremely smooth surface of the cobble, where it has not been altered by battering, indicates that it was subjected to alluvial action. This specimen was probably brought into the El Dorado area from further north. This specimen weighs 127.2 grams.

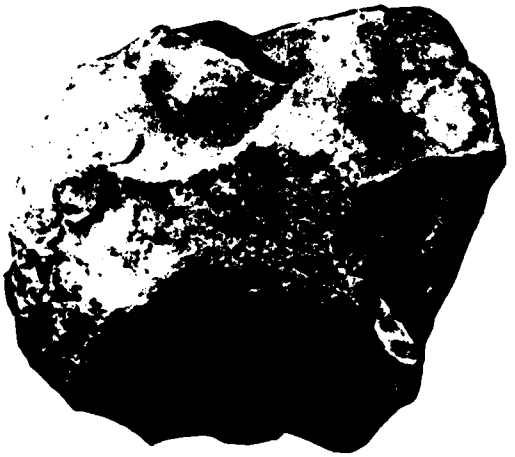
DISCUSSION

The analysis of the lithic assemblage recovered from 14BU72 has demonstrated that all stages of lithic manufacture are represented at the site; from initial procurement of raw materials to the final shaping of chipped stone tools. The presence of hammerstones, the abundance of chert cores, the large quantity of decortication elements and the predominance of intermediate flakes at the site substantiate that flake manufacture was a primary activity. That this flake

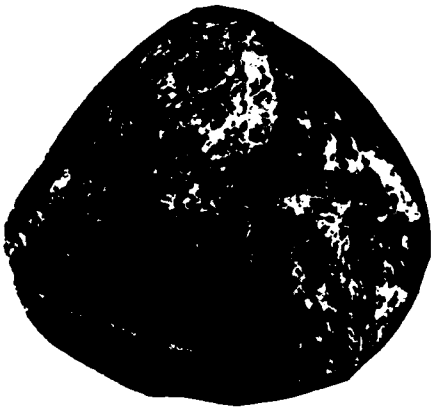
FIGURE 1.7

Hammerstones recovered from 14BU72: (A,B) lateral views of a hammerstone/core?; (C) metamorphic hammerstone.

a



b



c

production resulted in the manufacture of shaped tools is evident in the 63 shaped tools recovered from the surface of the site.

The preferred chert type of the prehistoric inhabitants was Florence A. This chert type is represented at the site over three times as often as Florence B chert which is the next most abundant chert type. Flint Hills Light Grey, while present at the site, comprises only 1% of the total assemblage. Florence A chert was often heat treated presumably to improve its flaking qualities.

The large number of finished tools recovered from the surface of 14BU72 in 1975 (Fulmer 1977), along with those recovered in 1980 indicate that a variety of activities were performed at the site. The projectile point recovered from the surface of the site in 1975 yields some evidence that hunting activities were carried out from the site (Ahler and McMillian 1976: 171). The chert tools recovered from the site suitable for cutting and scraping activities also yield evidence that the butchering of game, preparation of hides, and the manufacture of bone and wooden artifacts were activities which may have been performed at the site.

The large size of 14BU72, the evidence of all stages of lithic reduction, and the presence of a large number of chipped stone tools indicate that the site was occupied as a base camp rather than a specialized hunting camp or gathering area. The site is located on a natural ridge of the Walnut River floodplain which would have provided the prehistoric occupants protection from spring and early summer flooding. The close proximity of the site to upland resources, as well as to a perennial source of water, would have made it attractive as a habitation site.

However attractive the site may have been to the prehistoric inhabitants of the El Dorado Lake Area, there is not sufficient evidence to conclude that 14BU72 represents the former presence of a Woodland village as has been

suggested by Root (1978). No evidence of fire hearths, post molds, or burned daub concentrations indicative of the former presence of a habitation structure were encountered during the limited sub-surface testing conducted during 1980. There is also a near total absence of floral and faunal remains in the artifact inventory as well as the complete lack of ceramic material which would be expected at a permanent habitation site occupied by Woodland peoples. Thus it is concluded here that 14BU72 functioned as a temporarily occupied base camp in which a variety of subsistence activities were carried out. Foremost among these activities, and for which the best hard evidence is at hand, was the procurement of raw materials and the manufacture of chipped stone tools. Hunting, butchering, hide preparation, tool maintenance, woodworking and boneworking are other activities which can be inferred from the presence of these tools.

RECOMMENDATIONS

The limited sub-surface testing of 14BU72 has demonstrated that the site is largely, if not entirely, confined within the plowzone. The site has been adversely impacted by current and historic farming practices and artifact displacement has certainly occurred. The four backhoe trenches and post hole auger tests have provided data which confirm that no buried cultural deposit is present within the alluvial sediments of the Walnut River floodplain to a depth of 4 meters below surface. The relative paucity of cultural material recovered from the test excavations and surface survey of 14BU72 in 1980 indicates that the majority of the artifacts once present at the site had already been removed. This is evident in the large sample of material recovered in 1975 as compared to that recovered in 1980.

As noted, 14BU72 is situated in a ridge of the Walnut River floodplain. It will, therefore, only be directly impacted by the construction of the El

Dorado Reservoir during periods of flooding when the level of the water reaches 1347.5 feet above mean sea level. However, even at floodstage the majority of the site will not be innundated. Shore line erosion, especially along the two intermittent streams, which will be innundated at flood stage, will present the largest threat to this cultural resource.

Thus it is recommended that no further work be performed at 14BU72 other than a periodic monitoring of the site to assess the effects of the shore line erosion.

14BU73

PHYSICAL DESCRIPTION

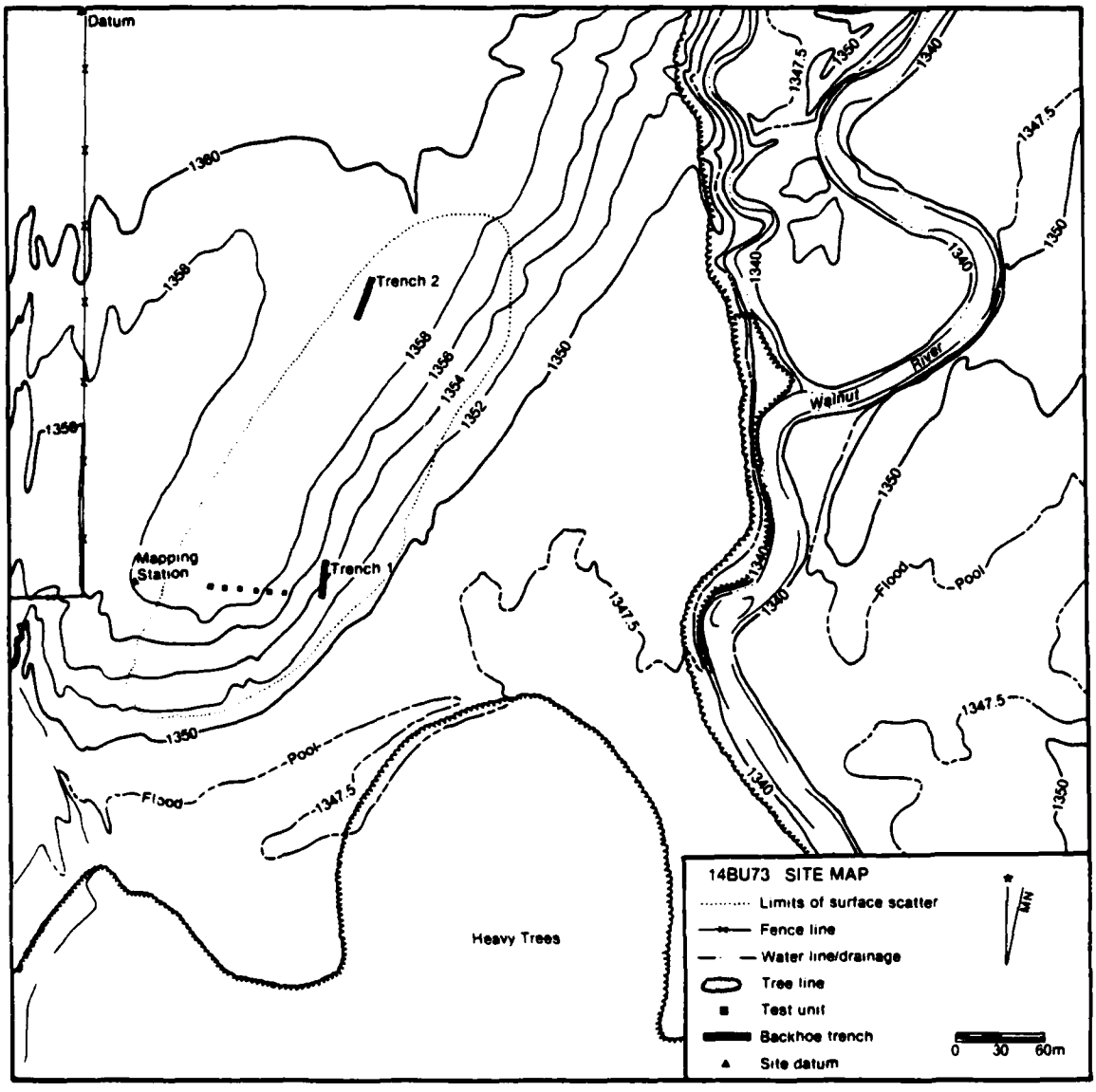
Site 14BU73 is located at the northern boundary of the project area, approximately one kilometer southwest of site 14BU72 (Fig. 1.1). 14BU73 is situated 200 meters west of the right bank of the Walnut River on the first terrace (T_1) above the floodplain (Fig. 1.8). The T_1 terrace is clearly visible. in Figure 1.8. It rises approximately 2.5 meters (8 feet) above the surface of the Walnut River floodplain.

The site was located by reference to the site survey records of the project area (Root 1978). At the time of the 1980 investigations the site consisted of a very light scatter of lithic debris widely dispersed along the margin of the T_1 terrace. The field in which 14BU73 is located was planted in milo which reduced surface visibility to only 25 to 50%. Given the light scatter of material and low surface visibility the boundaries of the site were somewhat difficult to precisely define. It is likely that recent farming practices and the slope erosion along the margin of the T_1 terrace have increased the area of the surface scatter beyond the actual limits of the site as it existed in prehistory. Thus the limits of the surface scatter illustrated in Figure 1.8 are only an approximation of the actual boundaries of the site when it was occupied prehistorically.

The area of heavy trees which is currently located several hundred meters south of the site boundaries indicates that prior to modern farming practices the site would have been closer to a source of timber. To the north and west the site grades into the uplands which at the time of the 1980 test investigations consisted of both pasture for cattle and fallow fields. These were most likely prairie grasslands prior to Euro-American settlement of the El Dorado area.

FIGURE 1.8

Topographic map of 14BU73 and vicinity.


Datum
1360
1358
1356
1354
1352
1350
1347.5
1340
Trench 2
Trench 1
Mapping Station
Walnut River
Flood Pool
Heavy Trees
14BU73 SITE MAP
Limits of surface scatter
Fence line
Water line/drainage
Tree line
Test unit
Backhoe trench
Site datum
MN
0 30 60m

The soil within which 14BU73 is located has been designated as Norge Silt Loam by the Soil Survey of Butler County, Kansas (U.S.D.A. 1975:15). This soil type consists of deep, nearly level to sloping, well drained soils on high terraces and uplands which formed in loamy sediment. Drew (1981:20) has postulated that the Norge Soil Series within the project area represents the remnants of a cut and fill terrace sequence which was deposited prior to 20,000 years B.P. Drew also notes that such a date has predictive value for the archaeology of the area since no burried archaeological sites would be expected in deposits of this antiquity. The test investigations conducted at 14BU73 serve in part as a weak test of this hypothesis. The placement of two backhoe trenches within the T_1 terrace and the terrace margin yielded no evidence of a buried cultural deposit within the Norge Soil series. Obviously such a test can not prove this hypothesis but only fails to disprove it.

ARCHAEOLOGICAL INVESTIGATIONS

14BU73 was first recorded as an archaeological site in 1975 by personnel from the Kansas University, Museum of Anthropology (Fulmer 1977:71). At that time a small sample of artifacts was recovered from the surface of the site. This sample included 27 pieces of chipped stone ranging in size from 1.5 to 8.2 cm, 3 pieces of limestone, and a metamorphosed sedimentary rock which Fulmer (1977:82) thought to be a possible hammerstone. This object is illustrated by Fulmer (1977, Appendix D). The cultural affiliation of the site was not determined since no diagnostic artifacts were recovered. It was also noted that none of the 27 elements of chipped stone bore evidence of having been utilized by the prehistoric inhabitants of the site.

14BU73 was revisited by personnel from the Museum of Anthropology in 1977 and an additional grab sample of artifacts was recovered from the surface of the site (Root 1978, 1979).

The areal extent of the site was estimated to be 15,000 square meters or 1.5 hectares based on the surface scatter of artifacts. As in 1975 no culturally diagnostic artifacts were recovered. Root (1979:71) recommended that 14BU73 receive limited test excavations to help formulate protective measures for this cultural resource.

Even though 14BU73 was not a known Woodland site its inclusion in the 1980 testing program is within the defined research goals of the project since the research design for the El Dorado Lake project calls for the limited subsurface testing of all archaeological components within the project area (Leaf 1976). The limited amount of time available to perform fieldwork during 1980 made the prudent scheduling of time imperative. The decision was made in the field to include 14BU73 among the Woodland sites tested in 1980 because it lies within close proximity to 14BU72. This proximity made it possible to schedule the use of a backhoe at both 14BU72 and 14BU73 in the same day which saved both time and money while providing information necessary to formulate decisions regarding the preservation of these cultural resources.

Fieldwork performed at 14BU73 in 1980 was initiated by a pedestrian surface reconnaissance of the milo field in which the site was located according to the site survey records of the project area (Root 1978:212). As already noted the artifact density on the surface of the site was very sparse. The majority of material appeared to be eroding out of the edge of the terrace at the southern portion of the site. The test investigation at the site began by laying out six one by one meter tests within the area of the site. The test pits were placed along the east-west baseline of the site grid at 10 meter intervals. They are numbered sequentially from west to east from one to six. As can be seen in Figure 1.8, they crosscut the margin of the T_1 terrace. The test pits were placed within this area of relatively high surface artifact density to discover the depth of the cultural deposit as well as to discern if any

intact cultural features were located within the area. With the discovery that the site was confined to the plowzone only four of the six test pits which were initially laid out were actually excavated.

Test pit 1 was placed in the southwestern portion of the site on the T_1 terrace. This test unit was excavated in arbitrary 10 cm units below the plowzone to a depth of 40 cm below the present ground surface. The plowzone was removed as a single 20 cm level. The stratigraphic profile of the completed excavation of test pit 1 is illustrated in Figure 1.9. The stratigraphy of test pit 1 correlates well with the stratigraphic profile of a typical Norge Series soil, as illustrated and described by the U.S.D.A. Soil Survey (1975:15). The upper 20 cm of the unit consists of the plowzone, a loose silt loam which is brown (10 YR 5/3) in color. The plowzone is underlain by a reddish brown (5YR 4/3) silty clay loam B1 horizon. An auger test placed at the base of this unit to a depth of 1.5 meters below surface revealed no apparent change in the color or texture of this lower horizon.

TABLE 1.11 Vertical distribution of artifacts in test pit 1--14BU73.

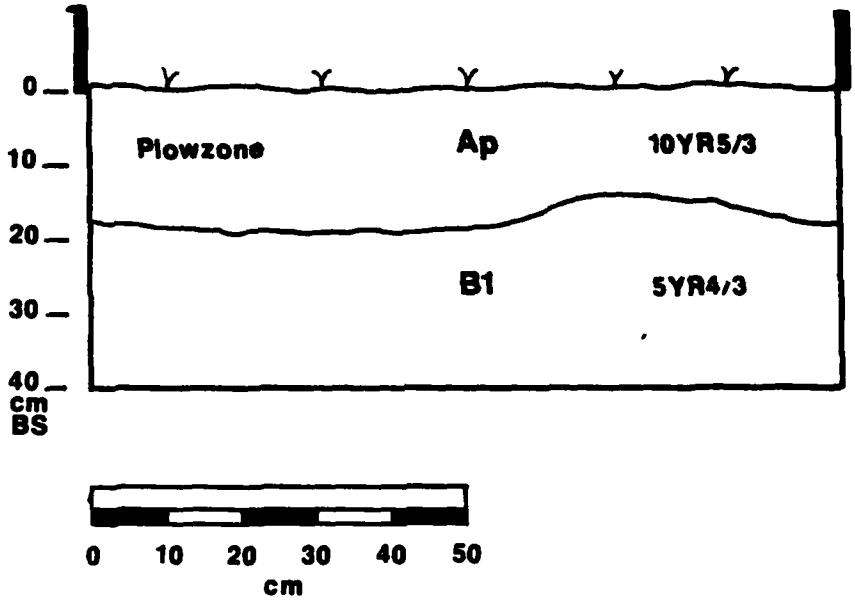
Level	No. of Artifacts
00-20 cm	115
20-30 cm	18
30-40 cm	11
TOTAL	144

The data in Table 1.11 indicate that the majority of cultural material within the unit is confined almost entirely to the plowzone. The seemingly high artifact count is biased by the large amount of limestone and gravel which together comprise 95 percent of the total sample of artifacts recovered from the unit. Only three small chert chips were encountered below the plowzone

FIGURE 1.9

Stratigraphic profile of test pit 1, 14BU73.

14BU73 TEST PIT 1
STRATIGRAPHIC PROFILE



of the unit. The presence of rodent burrows within the lower levels of the unit indicate that these elements migrated downward by natural processes after their cultural deposition.

Test pit 2 was placed 10 meters to the east of test pit 1 along the margin of the T_1 terrace. This unit was also excavated in arbitrary 10 cm levels below the plowzone to a depth of 40 cm below the present ground surface. The plowzone was removed as a single 20 cm unit. The stratigraphy of the unit is identical to that of test pit 1 and is not reproduced here.

TABLE 1.12 Vertical distribution of artifacts in test pit 2--14BU73.

Level	No. of Artifacts
00-20 cm	102
20-30 cm	3
30-40 cm	0
TOTAL	105

Table 1.12 indicates that as in test pit 1 the artifacts in test pit 2 are almost exclusively confined to the plowzone. Only 3 small pieces of limestone, with a combined weight of 4.2 grams, were recovered from the 20-30 cm level of the test pit. As in test pit 1 the overwhelming majority of artifacts recovered from the unit consist of limestone and gravel. In fact only one chert chip which measures less than 2 cm in maximum length was recovered from the entire unit.

Test pits 3 and 4 were also placed along the margin of the T_1 terrace. Test pit 3 was placed 10 meters east of test pit 2 and test pit 4 was placed 10 meters east of test pit 3. Both test pit 3 and test pit 4 were only excavated to a depth of 20 cm below surface. It was determined by the placement of the first two test pits and two backhoe trenches that the cultural component at 14BU73 did not extend below the plowzone. The material recovered from the

plowzone of these two units includes 6 small chert flakes, 372 pieces of limestone, and 35 pieces of gravel.

The two 25 meter backhoe trenches mentioned above were placed within the boundaries of the artifact scatter in an attempt to locate buried cultural deposits. As already noted none were discovered.

Backhoe trench 1 was placed on the slope of the T_1 terrace at the southeastern portion of the site to determine if the artifacts were eroding out of a buried cultural deposit. The trench was taken down to a depth of 1.5 meters below the surface of the terrace slope. Even though the walls of the backhoe trench were carefully trowled back, no cultural material was discovered below the plowzone. The east wall of the trench was photographed and profiled prior to backfilling. The stratigraphic profile of backhoe trench 1 is illustrated in Figure 1.10. This profile compares favorably with Norge Soil series profile described by the U.S.D.A. Soil Survey (1975:15). The uppermost 20 to 25 cm consists of the plowzone, a friable silty loam which is dark brown (10 YR 4/3) in color. Beneath the plowzone lies a silty clay loam B22t horizon which is yellowish red (5 YR 5/6) in color. This horizon extends to the base of the trench.

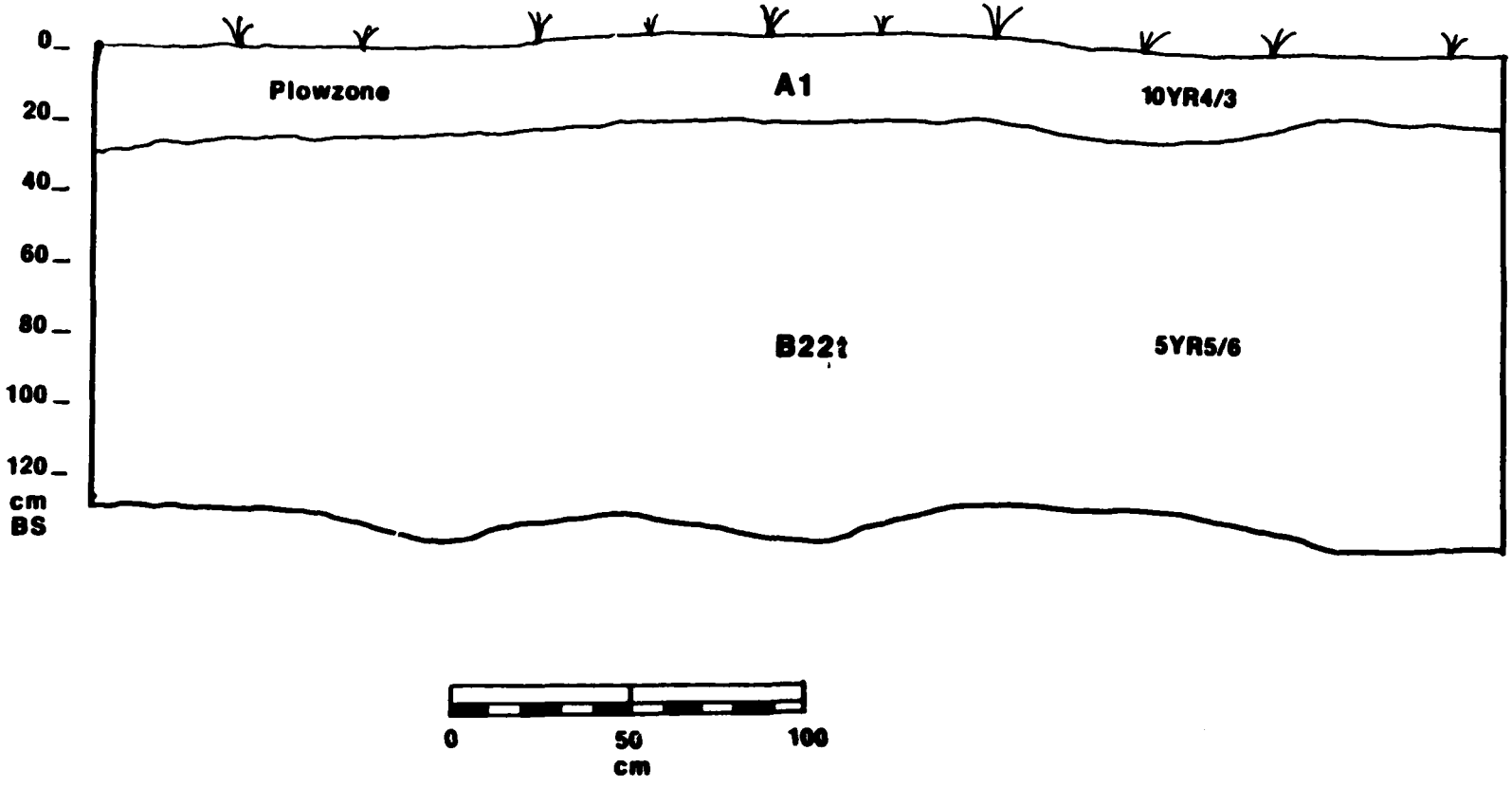
Backhoe trench 2 was placed 100 meters north of trench 1 at the top of the T_1 terrace. The trench was placed at the northwestern portion of the site because several chipped stone tools were located on the surface of the site within this area. The trench was taken down to a depth of 1.5 to 3.5 meters below surface. No cultural material was discovered below the plowzone even though, as in trench 1, the walls were carefully troweled back. The stratigraphy of trench 2 is identical to that illustrated in Figure 10 for trench 1 with the exception that the B22t horizon extends down to 3.5 meters below surface. The east wall of the trench was photographed and profiled prior to backfilling.

FIGURE 1.10

Stratigraphic profile of backhoe trench 1, 14BU73.

14BU73 BACKHOE TRENCH 1

STRATIGRAPHIC PROFILE



DISCUSSION

The test excavations conducted during 1980 at 14BU73 document that the unknown cultural component is confined to the plowzone. While it is possible that more than one archaeological component is represented at the site, no direct evidence of repeated occupations was encountered during the 1980 testing of the site. The low artifact density, in terms of tools and debitage, both on the surface of the site and within the test pits, indicates that the site was never intensively occupied.

The perimeter of the surface scatter of lithic debris within the milo field is illustrated in Figure 1.8. As already noted, this boundary probably inflates the actual site boundary since material is eroding down the slope of the terrace and is being plowed across the field. So the total area of 40,000 square meters, or 4 hectares, of the lithic scatter is best viewed as an approximation of the actual boundaries of the site as it existed in prehistory.

ARTIFACT ANALYSIS

Including the material recovered from the surface of the site and from the excavation of the test pits, a sample of 771 items was taken from 14BU73 in 1980. These included 28 chipped stone artifacts, 579 pieces of limestone, and 71 pieces of gravel. There were no faunal elements recovered from the site and a single hackberry seed (*Celtis occidentalis*) completes the floral inventory.

The large amount of unworked stone constitutes the majority of material recovered from the test excavations at the site. A total of 71 pieces of gravel with a combined weight of 215.1 grams were recovered from the four test pits actually excavated. This gravel, known locally as jasper, is generally brown in color and rather blocky in appearance. It ranges from

less than 1 cm up to 5 cm in maximum dimension. With the exception of only two elements, all of this material was recovered from the plowzone. Although this differential occurrence would seem to indicate a cultural rather than natural origin for this material, it is possible that the jasper was deposited on the surface as part of the cut and fill terrace sequence which Drew (1981) has postulated as responsible for the presence of the T_1 terrace of the Walnut River Valley within the project area. If this material is of cultural rather than natural origin, the manner in which it was utilized by the prehistoric inhabitants of the site is not readily apparent. None of this material appears to have been purposefully utilized in the manufacture of stone tools at the site. Nor was it thermally altered, which would be expected if it was used in activities such as stone boiling, roasting, or hearth construction.

A total of 579 pieces of limestone with a combined weight of 1090.2 grams were recovered from the 4 test pits excavated at 14BU73. The majority of these elements are small fragments. They range in size from less than 1 cm up to 5 cm in maximum dimension. Ninety-two of the 579 limestone fragments exhibit evidence of thermal alteration in the form of color change and compositional alteration. The 92 elements weigh 162.0 grams, which is approximately 15 percent of the total sample of limestone recovered in 1980. It was not determined in this analysis if these burned fragments were purposely fired or were subjected to a natural firing.

Ninety-five percent of the limestone recovered from the test pits at 14BU73 was contained within the plowzone. The remaining five percent was scattered between 20 and 40 cm below the surface of test pits one and two. Even though these figures are skewed by the fact that a total of 80 cubic cm of matrix were removed from the plowzone while only 40 cubic cm were

were removed from below the plowzone during the test excavations, they can be used to provide a valid comparison of the presence or absence of the material. Since there is not an equal distribution of limestone throughout the T_1 terrace deposit, it is likely that the limestone present at the site represents manuports carried to the site by the prehistoric inhabitants. As noted above, 15 percent of the limestone recovered exhibits evidence of thermal alteration which suggests that the manuports may have been used in activities such as stone boiling, roasting, or hearth construction. However, during the test investigations of 14BU73, no direct evidence of the remains of such features were encountered.

Table 1.13 lists the chert types and the presence or absence of thermal alteration for the 28 chipped stone artifacts recovered from both the surface and the test excavations at 14BU73 during 1980. Table 1.14 lists the same data for the 48 artifacts recovered from the surface of the site by Root (1979) in 1977. These data are combined in Table 1.15 which will be used as a more representative sample in the following analysis of the chipped stone from 14BU73.

TABLE 1.13 Chert types and thermal alteration of chipped stone technoclasses recovered from 14BU73 in 1980.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		IND/MISC		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORE	-	-	-	3	-	-	-	-	-	3
TOTAL	-		3		-		-		3	
CORTICAL CHUNKS AND SHATTER	-	1	-	-	-	-	-	-	-	1
TOTAL	1		-		-		-		1	
DECORTICATION FLAKES	-	-	-	-	-	-	-	1	-	1
TOTAL	-		-		-		1		1	
INTERMEDIATE FLAKES	2	3	-	2	-	-	-	-	2	5
TOTAL	5		2		-		-		7	
NONCORTICAL CHUNKS & SHATTER	-	1	-	1	-	-	-	-	-	2
TOTAL	1		1		-		-		2	
SHAPED TOOLS	2	3	-	5	1	-	-	3	3	11
TOTAL	5		5		1		3		14	
TOTAL	4	8	-	11	1	-	-	4	5	23
TOTAL	12		11		1		4		28	

TABLE 1.14 Chert types and thermal alteration of chipped stone technoclasses recovered from 14BU73 in 1977.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		IND/MISC		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORE	-	1	-	-	-	-	-	-	-	1
TOTAL	1		-		-		-		1	
CORTICAL CHUNKS	-	2	-	1	-	-	-	6	-	9
TOTAL	2		1		-		6		9	
INTERMEDIATE FLAKES	3	11	-	11	-	2	1	1	4	25
TOTAL	14		11		2		2		29	
NONCORTICAL CHUNKS	-	2	-	2	-	-	-	1	-	5
TOTAL	2		2		-		1		5	
SHAPED TOOLS	1	-	1	2	-	-	-	-	2	2
TOTAL	1		3		-		-		4	
TOTAL	4	16	1	16	-	2	1	8	6	42
TOTAL	20		17		2		9		48	

TABLE 1.15 Chert types and thermal alteration of chipped stone technoclasses recovered from 14BU73, combined samples.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		IND/MISC		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORE	-	1	-	3	-	-	-	-	-	4
TOTAL	1		3		-		-		4	
CORTICAL CHUNKS	-	3	-	1	-	-	-	6	-	10
TOTAL	3		1		-		6		10	
DECORTICATION FLAKES	-	-	-	-	-	-	-	1	-	1
TOTAL	-		-		-		1		1	
INTERMEDIATE FLAKES	5	14	-	13	-	2	1	1	6	30
TOTAL	19		13		2		2		36	
NONCORTICAL CHUNKS	-	3	-	3	-	-	-	1	-	7
TOTAL	3		3		-		1		7	
SHAPED TOOLS	3	3	1	7	1	-	-	3	5	13
TOTAL	6		8		1		3		18	
TOTAL	8	24	1	27	1	2	1	12	11	65
TOTAL	32		28		3		13		76	

Florence A chert numerically predominated in both the 1977 and 1980 samples, comprising 42% and 43% of the samples respectively. When the two samples are combined, Florence A chert comprises 42% of the total sample of artifacts recovered from 14BU73 (Table 1.16). The single core recovered from 14BU73 of Florence A chert was found on the surface in 1977. In addition to this core, the technoclasses of cortical chunks, intermediate flakes, non-cortical chunks, and shaped tools are in both the 1977 and 1980 artifact samples.

Florence B chert is represented at 14BU73 only slightly less often than Florence A chert. Florence B comprises 35% of the chert recovered in 1977 and 39% recovered in 1980. When the two samples are combined, 37% of the chipped stone artifacts are classified as Florence B chert (Table 1.16).

Three cores of Florence B chert were recovered from the surface of 14BU73 in 1980. The other technoclasses represented by this material type are the same as those represented by Florence A chert in both samples, with the exceptions that the 1977 sample lacks cores and the 1980 sample lacks cortical chunks.

Flint Hills Light Grey, while present in both the 1977 and 1980 samples represents only 4% of the total sample--3 artifacts. These include two intermediate flakes and a single shaped tool.

The category of intermediate/miscellaneous chert contains 13 artifacts, or 17% of the total sample recovered from 14BU73 (Table 1.16). Several elements included within this category are of a chert type currently recognized by El Dorado researchers as Cresswell chert (Haury 1981). In addition to the technoclasses of Florence A and Florence B chert, the technoclass

of decortication flakes is represented by a single element within this category.

TABLE 1.16 Raw material usage at 14BU73.

CHERT TYPE	1977	1980	COMBINED
FLORENCE A	20(42)	12(43)	32(42)
FLORENCE B	17(35)	11(39)	28(37)
FLINT HILLS LT. GREY	2(4)	1(4)	3(4)
MISC/INDET.	9(19)	4(14)	13(17)
TOTALS	48(100)	28(100)	76(100)

The lack of tested cobbles on the site indicates that chert was not procured at 14BU73 but at a separate locality. The four cores recovered from the surface of the site do, however, indicate that limited flake manufacture was performed. The only core recovered in 1977 was fashioned from Florence A chert while the three cores recovered in 1980 were manufactured from Florence B chert. The first of these three cores weighs 133.0 grams. It exhibits a single striking platform which measures 54 mm by 39 mm in maximum dimension. Flakes were removed along three of the four margins of the perimeter of this platform. Platform preparation is also present along the margin in the form of step fractures and edge crushing. The average edge angle of this platform measures 82 degrees.

The second core of Florence B chert weighs 221.0 grams and is the largest of the three cores of this material. The platform measures 78 mm by 37 mm in maximum dimension. The presence of negative flake scars indicates that flakes were removed from only two of the margins of this platform. The edge angle of the platform averages 78 degrees and platform preparation is present.

The third core of Florence B chert recovered in 1980 is much smaller than the two described above. It weighs only 67.4 grams and exhibits only one platform. Flakes have been removed from three of the four margins of the platform as indicated by the presence of negative flake scars. Platform preparation is present along the margin of the platform in the form of step fractures and edge crushing. The edge angle of the platform averages 80 degrees. This platform measures 36 mm by 24 mm in maximum dimension.

The decortication elements recovered from the site are sparse, represented by only ten cortical chunks and a single decortication flake (Table 1.15). Together these elements only represent 14 percent of the total of the combined artifact assemblage recovered in 1977 and 1980. The presence of only four cores, along with the lack of tested cobbles and the sparse number of decortication elements, demonstrates that the initial reduction of raw material was not an important activity at the site.

The 36 intermediate flakes and 6 non-cortical chunks represent 56% of the combined 1977 and 1980 samples (Table 1.15). This relatively large quantity of intermediate elements, in contrast to the limited number of elements representative of the initial reduction of raw materials, indicates that flakes were manufactured at the site from cores initially prepared at another locality. The rather limited manufacture of these flakes appears to have been a primary technological activity at the site.

Including the four shaped tools obtained from the surface of 14BU73 in 1977, a total of 18 shaped tools have been recovered from the site (Table 1.15). The absence of bifacial trimming flakes from both the 1977 and 1980 artifact samples, however, indicates that the manufacture or maintenance of bifacially chipped stone tools was not a prevalent activity at the site. Only eight of the 18 tools recovered from the site are classifiable as bifaces or biface fragments. The other 10 tools are best

categorized as modified or retouched flakes. The predominance of these elements within this sample indicates that the object of the limited flake production at 14BU73 was the manufacture of what Artz (1981:71) has termed 'ad hoc' tools; i.e., opportunistically-manufactured flakes used in the performance of various tasks.

The data in Table 1.15 reveal that only 11 of the 65 chipped stone artifacts recovered from 14BU73 were heat treated by the prehistoric inhabitants. These 11 elements represent 14% of the total assemblage. Eight of the 11 elements were manufactured from Florence A chert, while only a single element of both Florence B and Flint Hills Light Grey chert exhibited evidence of heat treatment. The remaining heat treated intermediate flakes could not be classified as to chert type. The predominance of heat treated Florence A chert indicates that while this material was the preferred chert type, it often required the technological process of heat treatment to render it suitable for utilization by the prehistoric inhabitants of 14BU73.

The only technoclasses which were heat treated within the Florence A chert type include both intermediate flakes and shaped tools. Of these two, the technoclass of shaped tools exhibits the highest ratio of heat treated elements (Table 1.15). Within the Florence B and Flint Hills Light Grey chert types, heat treatment is present only within the technoclass of shaped tools. The fact that only shaped tools and intermediate flakes were heat treated indicates that raw materials were heat treated only after they were selected for tool manufacture, or that the tools were brought to the site already heat treated. The presence of six intermediate heat treated flakes would seem to indicate that heat treatment was performed at the site. However, it is possible that these flakes were struck from cores which were heat treated at another locality. Thus, it can only be concluded that the

prehistoric occupants of 14BU73 were capable of heat treating chert, not whether this activity was actually performed at the site.

SHAPED TOOLS

Only the 14 tools recovered from 14BU73 during the 1980 field season are described in this report. These consist of three complete bifaces, four biface fragments, six modified flakes and one notch (Table 1.17).

The largest of the three complete bifaces is illustrated in Figure 1.11A. This tool measures 72.0 mm in maximum length, 70.0 mm in maximum width and is 35.0 mm thick. It weighs 71.8 grams. The negative flake scars visible in the illustration form an acute edge angle which averages 62 degrees. The opposite margin of the tool is blunted which facilitates holding the tool. The reverse side of this biface exhibits the presence of cortex which indicates that the tool was manufactured from a relatively unaltered cobble of Cresswell chert. The acute edge angle and position of the working edge indicates that this biface was utilized as a heavy cutting tool or chopper. The step fractures along the working edge of the tool indicate that it was intensively utilized before being discarded.

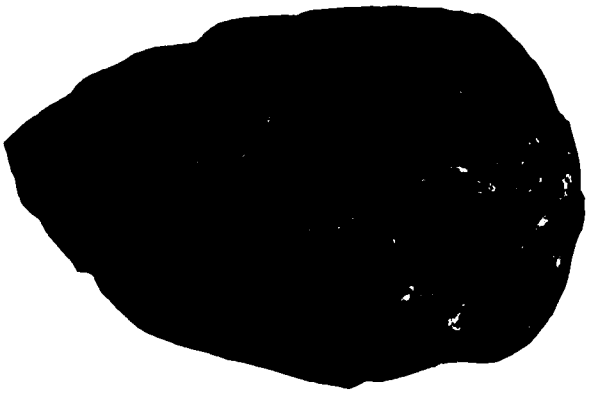
TABLE 1.17 Morphological/functional categories and chert types of shaped tools recovered in 1980, 14BU73.

MORPHOLOGICAL/ FUNCTIONAL CATEGORIES	FLORENCE A	FLORENCE B	LIGHT GREY	CRESSWELL	TOTAL
BIFACE	2	-	-	1	3
BIFACE FRAGMENT	3	-	1	-	4
RETOUCHED FLAKE	-	5	-	1	6
NOTCH	-	-	-	1	1
TOTAL	5	5	1	3	14

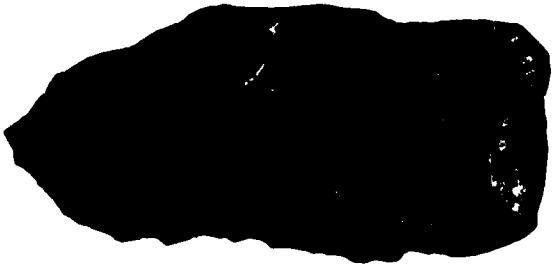
FIGURE 1.11

Complete bifaces recovered from 14BU73.

a



b



c

0 mm 30

The second complete biface recovered from the surface of 14BU73 in 1980 was manufactured from Florence A chert (Figure 1.11B). The tool measures 75.0 mm in maximum length, 49.0 mm in maximum width and 16.0 mm in thickness. It weighs 54.4 grams. The presence of cortex on the dorsal surface of the tool can be seen in the illustration. The tool is retouched along the lateral margins. The right margin of the tool exhibits a more acute edge angle which averages 47 degrees. The left margin is somewhat more steeply retouched and the edge angle is more obtuse, measuring 53 degrees. These edge angles are within the range of edge angles Wilmsen (1970:70) has suggested are suitable for a wide variety of cutting and scraping activities, including plant processing, hideworking and woodworking.

The third complete biface recovered in 1980 was also manufactured from Florence A chert. It measures 70.0 mm in maximum length, 31.0 mm in maximum width and is 16.0 mm thick. This tool weighs 33.3 grams (Figure 1.11C). Unlike the other two complete bifaces described above, this specimen is completely flaked on both sides. It has been marginally retouched or sharpened along the distal lateral margins which have an average edge angle of 54 degrees. The proximal lateral margins of the tool are slightly narrowed and blunted as if to facilitate hafting the tool. Only the distal lateral margins of the tool appear to have been utilized. The edge angles of the tool are within the range of angles Wilmsen (1970:70) has described as suitable for a wide variety of cutting and scraping activities.

Of the four biface fragments recovered in 1980, two are distal fragments, one is a medial fragment, and one is a proximal fragment. The first of these biface fragments was manufactured from Flint Hills Light Grey chert and is illustrated in Figures 1.12A and 1.12B. This fragment represents the tip of a heat treated biface which was not completely flaked on both sides. Rather, it was invasively retouched on the side visible in Figure 1.12A,

FIGURE 1.12

Biface fragments and notch from 14BU73.


a
b
c
d
e
f
0
mm
30

and marginally retouched on the side visible in Figure 1.12B. The tool does not appear to have been heavily utilized. It was discarded after it broke, presumably while being used since there is little evidence of biface manufacture at the site. This fragment measures 42.0 mm in maximum length, 41.0 mm in maximum width, and is 8.0 mm thick. It weighs 14.0 grams. The tip of the specimen does not exhibit an impact fracture which would be expected if it had been used as a projectile point. The lateral margins of the tool possess an acute edge angle which measures 34 degrees. This angle is suitable for a cutting tool (Wilmsen 1970:70).

The other distal fragment, recovered in 1980, was also manufactured from Florence A chert and is illustrated in Figure 1.12C. This small fragment measures only 17.0 mm in maximum length, 24.0 mm in maximum width and is 4.0 mm thick. It weighs only 2.0 grams. It has been retouched along the lateral margins to an edge angle of 40 degrees. The burin like tip may have been used for engraving or boneworking.

The other two biface fragments were manufactured from heat treated Florence A chert. The first of these is illustrated in Figure 1.12D. It is the proximal fragment of a small, thin biface which was completely flaked on both sides. It measures 33.0 mm in maximum length, 32.0 mm in maximum width, and is 8.0 mm thick. It weighs 9.0 grams. The lateral margins of this biface fragment exhibit step fractures indicating the tool was fairly intensively utilized. The average edge angle of the lateral margins of the tool is 38 degrees. The remaining biface fragment is illustrated in Figure 1.12E. It is a small medial fragment of what appears to be a projectile point, although it is too small and incomplete to conclude that it is anything other than a biface fragment. It measures only 14.0 mm in maximum length, 27.0 mm in maximum width and is 6.0 mm thick. It weighs 2.7 grams. The lateral edge angles

average 32 degrees. The edge angles of these latter two biface fragments indicate that they also functioned as cutting tools.

The only notch recovered from the surface of the site is illustrated in Figure 1.12F. This tool was fashioned from Cresswell chert. The presence of cortex on the opposite side of this tool indicates that it was manufactured from a relatively unaltered piece of raw material. The notch is visible in the illustration. It is steeply retouched to an angle of 88 degrees which is suitable for scraping activities. The tool measures 91.0 mm in maximum dimension and is 19.0 mm thick. It weighs 109.6 grams.

The five retouched flakes recovered from the surface of the site were manufactured from Florence B chert. They range in size from 1.7 to 2.9 cm in maximum dimension and exhibit retouch on transverse or lateral margins. The remaining retouched flake is of Cresswell chert and was encountered within the plowzone of test pit 1. It measures 2.5 cm in maximum dimension and was retouched on the transverse margin. These flakes can be separated into two functional classes based on criterion of working edge angle, working edge shape, and working edge placement. Four of them are classified as cutting tools and two are classified as scraping tools.

DISCUSSION

The analysis of the lithic assemblage recovered from 14BU73 has demonstrated that the procurement and initial reduction of raw materials was not an important activity at the site. The predominance of intermediate elements within the assemblage indicates that most of the chert was brought to the site in the form of previously trimmed cores. Three cores were recovered from the surface of the site in 1980. As evidenced by the lack of bifacial trimming flakes, little manufacture or maintenance of bifaces was carried out at the site. The bifacial tools encountered on the surface of the site were probably

brought to the site after they were manufactured at another locality.

Given the light scatter of material at the site, 14BU73 probably represents a small camp from which a number of specialized activities were carried out. The presence of finished tools, primarily suitable for cutting and scraping, indicates that rather specific extractive activities were performed. The butchering of game, plant processing, hide preparation or the manufacture of bone or wooden artifacts are activities which could have occupied the prehistoric inhabitants.

The site is located on the T_1 terrace of the Walnut River Valley which would have provided protection from spring and early summer floods as well as providing a good view of the surrounding terrain. The site was scattered over a large area of the terrace and probably represents a series of repeated occupations rather than a single occupation. The lack of evidence of any habitation structures or permanent features indicates that the occupations were of a temporary nature.

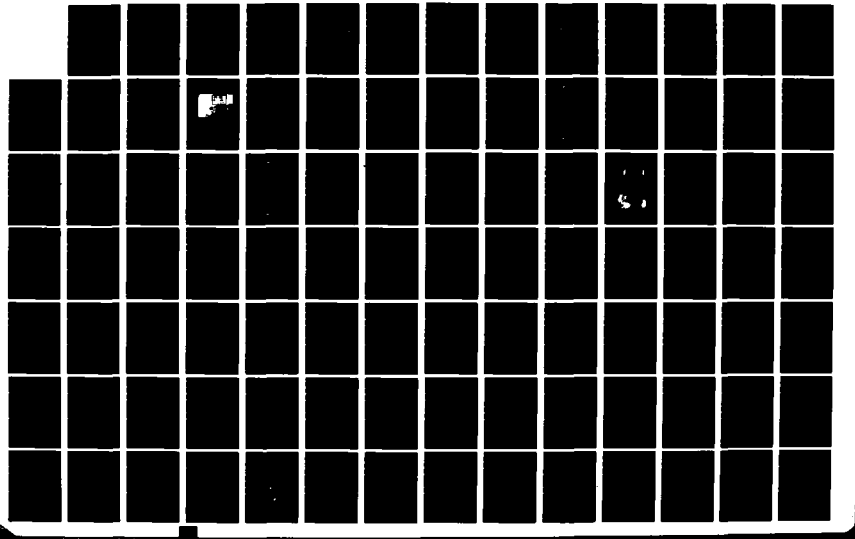
RECOMMENDATIONS

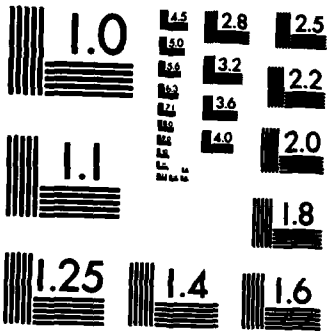
The limited sub-surface testing of 14BU73 has demonstrated that the site is confined within the plowzone. The site has been adversely impacted by current and historic farming practices which have displaced artifacts and destroyed any features which may have been present. The farming activities have also resulted in erosion along the terrace margin. The two backhoe trenches and the post hole auger tests confirm that no buried cultural deposits exist below the plowzone to a depth of 4 meters below the surface of the T_1 terrace.

14BU73 is located above the El Dorado Lake floodpool elevation of [illegible] feet above mean sea level and will not be directly impacted by the construction of El Dorado Lake. The site will continue to erode [illegible]

AD-A125 346 PHASE IV ARCHAEOLOGICAL INVESTIGATIONS AT EL DORADO LAKE BUTLER COUNTY KANSAS SUMMER 1980(U) KANSAS UNIV LAWRENCE MUSEUM OF ANTHROPOLOGY A E JOHNSON ET AL. 2/3

UNCLASSIFIED 1980 DACW56-77-C-0221 F/G 5/6 NL





slope with the continuation of farming practices and it should be taken out of cultivation. No further work is recommended at 14BU73 other than a periodic monitoring of the site to assess the effects of erosion along the T_1 terrace margin.

14BU5

PHYSICAL SETTING

Site 14BU5 is located 300 meters from the confluence of Durechen Creek and the Walnut River (Figure 1.1). The site has been subdivided into three areas which are separated by the meander loop of Durechen Creek (Figure 1.13). These three areas have been designated 14BU5A, 14BU5B, and 14BU5C by personnel from the Museum of Anthropology at the University of Kansas (Eoff and Johnson 1968; Bastian 1979).

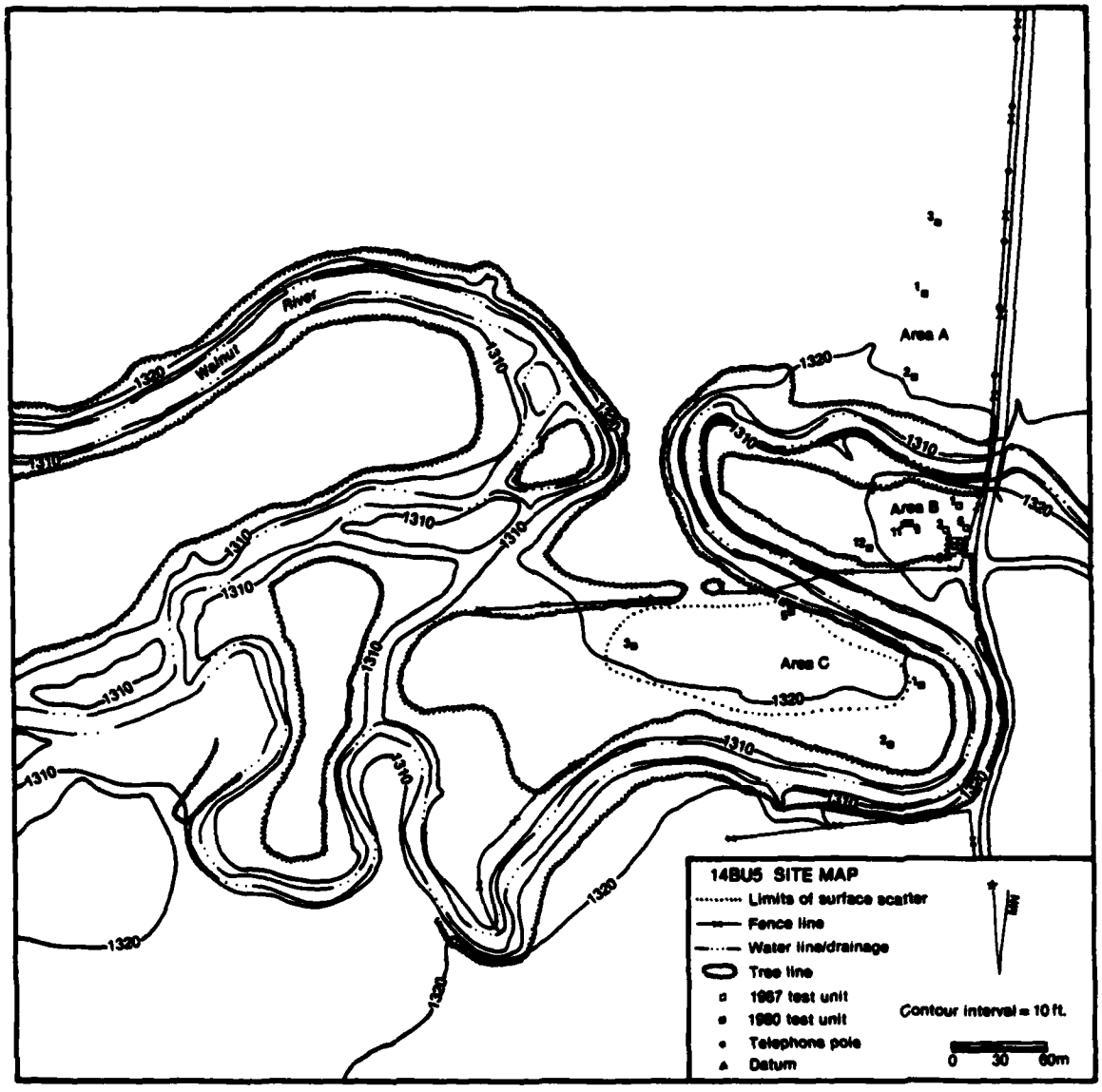
Areas A and C of 14BU5 are located on the floodplain of both Durechen Creek and the Walnut River; while Area B of the site is located on a point bar of the Durechen Creek floodplain which is enclosed by the meander loop. The gallery forests that presently exist along both Durechen Creek and the Walnut River indicate that much of these three areas would have been forested prior to modern cultivation practices. The northern portion of Area A of the site extends into the uplands which were prairie grasslands in prehistory. All three areas of 14BU5 are located on the soil type defined by the Butler County Soil Survey (USDA 1975) as Verdigus Silt Loam. This soil series has been discussed in some detail in the analysis of 14BU72 earlier in this report. The elevation of the site is well below that of the conservation pool of El Dorado Lake and all three areas of the site will be completely indundated.

PRIOR INVESTIGATIONS

Site 14BU5 was originally recorded in 1967 by personnel from the Museum of Anthropology of the University of Kansas (Eoff and Johnson 1968). The site, as already noted, was divided into three sub-areas, designated Area A, Area B, and Area C, by the meander loop of Durechen Creek. During the initial surface survey, however, material was recorded without regard to the sub-area

FIGURE 1.13

Topographic map of 14BU5 and vicinity.


Walnut River
Area A
Area B
Area C
1320
1310
14BU5 SITE MAP
Limits of surface scatter
Fence line
Water line/drainage
Tree line
1987 test unit
1980 test unit
Telephone pole
Datum
Contour interval = 10 ft.
0 30 60m

from which it was derived since all three areas of the site were thought to represent the same cultural components. Based on the recovery of 14 artifacts, including four ceramic sherds, the site was assigned both a Plains Woodland and a Plains Village cultural component. The recommendation was made by Eoff and Johnson (1968:42) that the site receive large scale excavation.

During the summer of 1968, Area B of 14BU5 was test excavated by personnel from the Museum of Anthropology (Bastian 1979). Seven 2.0 by 2.0 meter test pits were hand excavated within this area of the site. The test excavations produced materials diagnostic of a Plains Woodland cultural affiliation. These included a Scallorn projectile point and several ceramic sherds. The test excavations carried out in 1968 by Bastian (1979) also documented the presence of an intact subplowzone deposit at the southwest portion of Area B. No information regarding the cultural status of Areas A and C was recorded.

14BU5 was surface collected in 1975 by Fulmer (1977). A ceramic body sherd was recovered but the area from which it was obtained was not recorded. The sherd measures 2.1 cm in maximum dimension and is 1.0 cm thick. It is tempered with angular quartzite particles with a maximum dimension of approximately 2.0 mm. Fulmer (1977:71) recorded the interior surface as grey brown and the exterior surface as red brown. Both surfaces of the sherd are smooth. Also recovered by Fulmer (1977) in 1975 were 36 pieces of chipped stone ranging in maximum dimension from 1.3 cm to 5.5 cm. One flake was noted to have been utilized. Two fragments of unidentified bone, a piece of burned earth, and a fragment of burned limestone complete the artifact inventory recovered from 14BU5 in 1975.

The presence of an intact Woodland cultural component at 14BU5B and the essentially unknown cultural affiliation and relationships of 14BU5A and 14BU5C, led to the decision to reinvestigate the site in 1980. The research

design submitted to the Tulsa District of the United States Army Corps of Engineers for Phase IV of the El Dorado Reservoir Project noted that Bastian's (1979) report had inadequately recorded the intact Woodland cultural deposit. The presence of the deposit was considered very significant because of the current lack of knowledge of the Woodland cultural tradition within the project area. The report submitted by Bastian (1979) also gave no data as to the cultural status of Areas A and C.

14BU5A

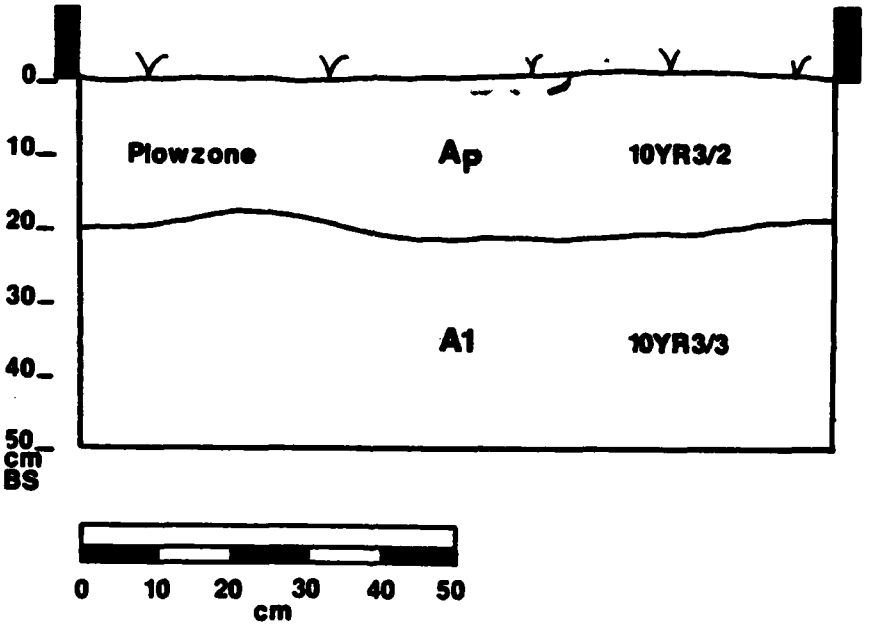
The archaeological investigations at 14BU5A in 1980 began with a pedestrian surface reconnaissance of the wheat field in which the site was located according to site survey records of the project area (Root 1978) and the report of the 1968 test investigations (Bastian 1979). Due to the poor surface visibility no artifacts were located on the surface of the site during the initial survey. Shovel cuts were placed at 10 meter intervals along north-south transects in an effort to locate the site boundaries but this strategy proved to be largely unsuccessful because of extremely low artifact density. The exact boundaries remain unknown. Three 1.0 by 1.0 meter test pits were placed 50 meters apart along a north-south baseline to determine the nature of the cultural deposit within the area of the site.

Test Pit 1 was placed in the center of the area of the field in which Area A of the site was located according to the site survey records (Root 1978:4). Test Pit 2 was placed 50 meters south of Test Pit 1 and Test Pit 3 was placed 50 meters north of Test Pit 1. All three units were excavated in arbitrary 10 cm. levels below the plowzone to a depth of 50 cm. below surface. The plowzone of all three units was removed as a single 20 cm. level. The stratigraphic profile of Test Pit 3 is illustrated in Figure 1.14. The profile of this unit is very similar to that of a typical Verdigris Soil Series profile as described

FIGURE 1.14

Stratigraphic profile of test pit 3, 14BU5A.

14BU5A TEST PIT 3
STRATIGRAPHIC PROFILE



and illustrated by the U.S.D.A. Soil Survey (1975:21). The plowzone consists of the upper 20 cm. of loose alluvial sediment which is dark brown (10YR3/2) in color. Below the plowzone lies a dark brown (10YR3/3) silty clay loam A1 horizon which extends to the base of the unit. This profile is very similar to that of test pits 1 and 2 which are not illustrated. A post hole auger was placed at the base of each of these units to a depth of 1.5 meters below surface. No buried cultural material was encountered by the auger tests in the three units and no changes in stratigraphy were noted.

As is shown in Table 1.18 the majority of the artifacts recovered from the three test pits within Area A of 14BU5 is confined within or just below the plowzone. The high artifact count obtained from these three units is misleading because it is comprised almost entirely of unworked stone consisting of limestone and gravel which is of dubious cultural origin.

TABLE 1.18 Vertical distribution of artifacts in test pits 1-3, 14BU5A.

Level	Limestone	Gravel	Chert	Total	Percent
1-20 cm. (Plowzone)	63	76	4	143	34
20-30 cm. BS	130	62	2	194	46
30-40 cm. BS	51	13	-	64	15
40-50 cm. BS	10	10	-	20	5
TOTALS	254	161	6	421	100

A majority of the limestone and gravel was encountered within the upper 30 cm. of the floodplain deposit in each of the three test pits. However, unlike the chipped stone chert artifacts both the limestone and gravel were encountered to a depth of 50 cm. below surface. This indicates that the limestone and gravel are of a natural rather than a cultural origin. Only 5 of the 254 pieces of limestone appear to have been thermally altered indicating a natural rather than purposeful firing of the material.

Only 6 chipped stone artifacts manufactured from Florence A and Florence B chert were recovered from the 3 test pits in Area A. These include one decortication flake, 4 non-cortical chunks, and a single tested cobble (Table 1.19). This sample size is too small to draw any meaningful conclusions about prehistoric activities at the site. However, it is possible to speculate that the initial processing of raw materials was an activity carried out at the site.

DISCUSSION

The 1980 test investigations at 14BU5A have demonstrated that the site is confined within or just below the plowzone. Post hole auger tests have demonstrated that no buried cultural deposit is present below the three test pits to a depth of 1.5 meters below the surface. The only material recovered from the site consisted of a large amount of unworked stone and 6 chipped stone chert artifacts. The cultural affinity of area A of 14BU5 remains unknown as does the relationship of Area A to Areas B and C of the site. The size of the site can only be roughly estimated given the poor surface visibility and sparse artifact density. The area of 14BU5A is approximately 1 hectare. No further work is recommended at 14BU5A. The site will be innundated by the conservation pool of the El Dorado Reservoir.

14BU5B

Area B of 14BU5 is located on a point bar which is enclosed by the meander loop of Durechen Creek. Bastian (1979) placed seven test pits within this area of the site which documented a subplowzone deposit at the southwestern portion of Area B. The approximate locations of the seven test pits excavated in 1968 are illustrated in Figure 1.13.

Archaeological investigations at 14BU5B began with the cutting of the dense vegetation which covered the site in 1980. This vegetation consisted

TABLE 1.19 Chert types and thermal alteration of chipped stone technoclasses, 14BU5A.

TECHNOCLASS	FLORENCE A		FLORENCE B		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
DECORTICATION FLAKES	-	1	-	-	-	1
TOTAL	1		-		1	
NONCORTICAL CHUNKS	-	1	-	3	-	4
TOTAL	1		3		4	
TESTED COBBLES	-	-	-	1	-	1
TOTAL	-		1		1	
TOTALS	-	2	-	4	-	6
TOTAL	2		4		6	

of 8 foot high weeds and saplings which completely obscured the surface of the site. Even after this vegetation was removed surface visibility was near zero.

A mechanical post hole auger was used within this area of the site to attempt to locate areas where artifact density was greatest and also to define the areas of the subplowzone cultural deposit recorded by Bastian (1979). The auger holes were placed at 10 meter intervals along the east-west and north-south baselines of the site grid. The diameter of the mechanical post hole auger was 35 cm. and the post holes were taken to a depth of 50 cm. below surface. Results of the auger tests indicated that very little of the cultural deposit remained undisturbed. This area was recorded by Bastian (1979) as the southwest portion of Area B.

Five 1.0 by 1.0 meter test pits were placed within Area B of 14BU5 during the 1980 field season. The location of these test pits is illustrated in Figure 13. Test Pit 8 is located in the southwest portion of the site in the area where Bastian (1979) recorded discovering the intact subplowzone deposit. This test unit was dug in arbitrary 10 cm. vertical levels below the plowzone to a depth of 50 cm. below surface. The plowzone was removed as a single 20 cm. level. As can be seen in Table 1.20 the majority of material recovered from this unit is confined within or just below the plowzone. The single chert flake located at 40-50 cm. below the surface was the only definate cultural evidence that the site extended below 30 cm. from the surface. The presence of 5 small pieces of limestone which have a combined weight of 13.5 grams are the only other indications of a buried cultural component below the plowzone. The gravel recovered from the unit is probably of natural rather than cultural origin since it occurs throughout Area B.

The lower levels of this unit could not be screened due to the saturated state of the soil at the time of the excavation. The backdirt from each of

the lower three levels below the plowzone was inspected by hand for artifacts. This procedure undoubtedly has biased the artifact count given in Table 1.20. Test Pit 8 is located within Verdigris soil and the vertical profile of the unit does not significantly differ from the typical Verdigris Soil Series profile described and illustrated by the Butler County Soil Survey (U.S.D.A.: 1975:21).

Test Pit 9 was placed 45 meters to the northeast of Test Pit 8 on a diagonal across the field. It is located at the center of Area B of 14BU5 where the auger tests indicated an increased density of cultural material. During the excavation of Test Pit 9 a concentration of burned limestone was encountered just below the plowzone at the eastern edge of the unit. In order to better define this limestone concentration an additional test unit, designated Test Pit 11, was opened adjacent to the east wall of Test Pit 9. It was found that the limestone concentration continued in Test Pit 11 and was even more dense than in Test Pit 9. This concentration of limestone encountered in Test Pit 11 was designated Feature 1. Figure 1.15 illustrates how this feature appeared at 25 cm. below surface. The hard spot in the center of the illustration was apparently baked out by thermal activities, apparently associated with the function of the feature. Figure 1.16 is a schematic plan view of the feature as it appeared between 30 and 35 cm. below the surface of the Durechen Creek floodplain. The baked area visible in Figure 1.15 continued down to this level. Only two small charcoal samples were recovered from the feature. These were obtained from between 30 to 35 cm. below the surface and were in direct association with the feature. These two samples were sent to the University of Georgia for radio-carbon analysis. Unfortunately, both of the samples were of insufficient mass to be run individually and they had to be combined to obtain even a single date.

TABLE 1.20 Vertical distribution of artifacts in test pit 8, 14BU5B.

Level	Limestone	Chert	Gravel	Total
0-20 cm (Plowzone)	37	25	13	75
20-30 cm.	1	2	2	5
30-40 cm.	1	0	1	2
40-50 cm.	3	1	0	4
TOTAL	42	28	16	86

TABLE 1.21 Vertical distribution of artifacts in test pits 9 and 11, 14BU5B.

Level	Limestone	Chert	Gravel	Total
0-20 cm. (Plowzone)	40	15	103	158
20-30 cm.	72	7	7	86
30-40 cm	68	5	1	74
40-50 cm.	115	0	0	115
TOTAL	295	27	111	433

TABLE 1.22 Vertical distribution of artifacts in test pits 10 and 12, 14BU5B.

Level	Limestone	Chert	Gravel	Total
0-20 cm. (Plowzone)	5	3	32	40
20-30 cm.	4	4	15	23
30-40 cm.	5	0	12	17
40-50 cm.	0	0	2	2
TOTAL	14	7	61	82

FIGURE 1.15

Feature 1 as it appeared at 25 cm below surface. Note the hard, dry sediment indicated by the lighter color of the soil in the center of the illustration.

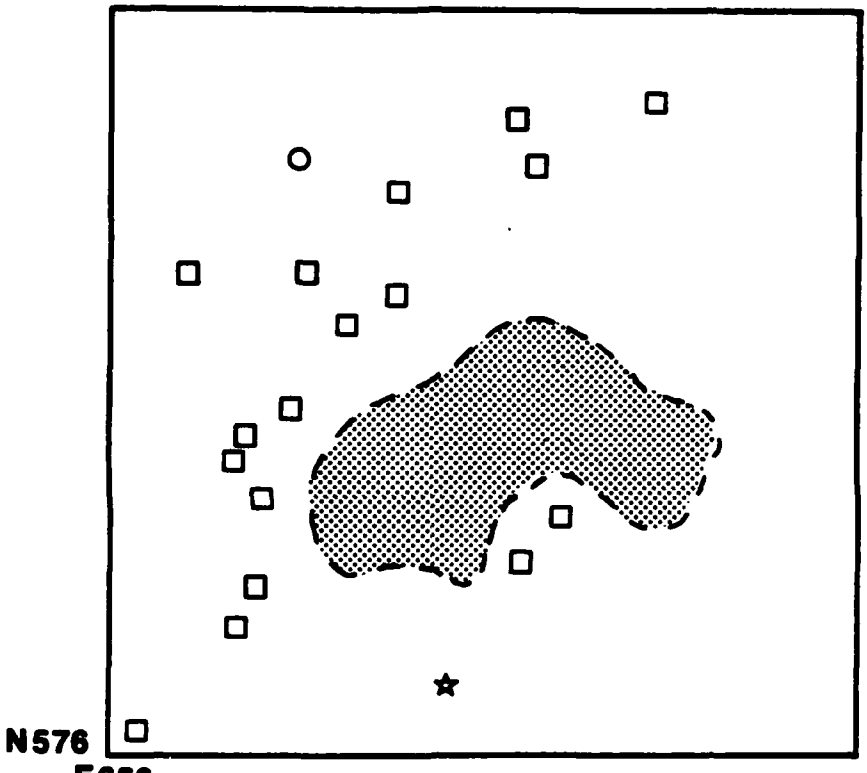

14 BU 5b
Feature 1
N →
8-18-80

FIGURE 1.16

Plan view of Feature 1 as it appeared between 30 and 35 cm below surface.

14BU5B PLAN VIEW OF FEATURE 1

TEST PIT 11 30-35 cm BS



The radio-carbon date obtained from the combined charcoal samples recovered from within Feature 1 (UGa #3947) proved to be modern. Given the context of the samples and the depth below surface from which they were obtained it is probable that they were contaminated and the modern date is in error. If this feature were modern in date historic artifacts would have been expected. No historic artifacts were recovered from either Test Pit 9 or 11.

Feature 1 most likely represents the remains of a roasting pit rather than a hearth. The presence of a large amount of burned limestone and the relatively small amount of burned earth and charcoal indicates that direct, in situ, combustion did not take place within the feature. Rather the limestone was probably heated first and then placed in a shallow depression represented by Feature 1. Presumably this was done to roast food. Of the 183 pieces (743.6 grams) of limestone recovered from Feature 1, 47 percent by weight (352.0 grams) were thermally altered. If these manuports were directly fired within the feature much more charcoal and burned earth would be expected than was recovered.

The vertical distribution of artifacts within Test Pits 9 and 11 is given in Table 1.21. This distribution clearly demonstrates the presence of the intact subplowzone deposit recorded by Bastian (1979). The 183 pieces of limestone recovered between 30 and 50 cm. below the ground surface are the manuports recovered from Feature 1. Four small chert chips, all of which are less than 2 cm. in maximum dimension, were directly associated with the feature. A chert chunk was also located with chert chips between 30 and 40 cm. below the surface. The subplowzone deposit probably extends to approximately 40 cm. below the surface in most of the southwest portion of the site. The gravel recovered from Test Pits 9 and 11 was confined almost exclusively to the plowzone. It was most likely washed into the site during periods of

flooding.

The vertical profile of Test Pits 9 and 11 is illustrated in Figure 1.17. The upper 15 to 20 cm. of these units consists of the plowzone, a loose alluvial sediment which is dark grayish brown (10YR4/2) in color. It is underlain by a silty clay loam A11 horizon that extends to 40 cm. below surface and is dark grey (10YR4/1) in color. The A11 horizon is underlain by an A12 horizon which consists of a dark brown (10YR4/3) silty clay loam.

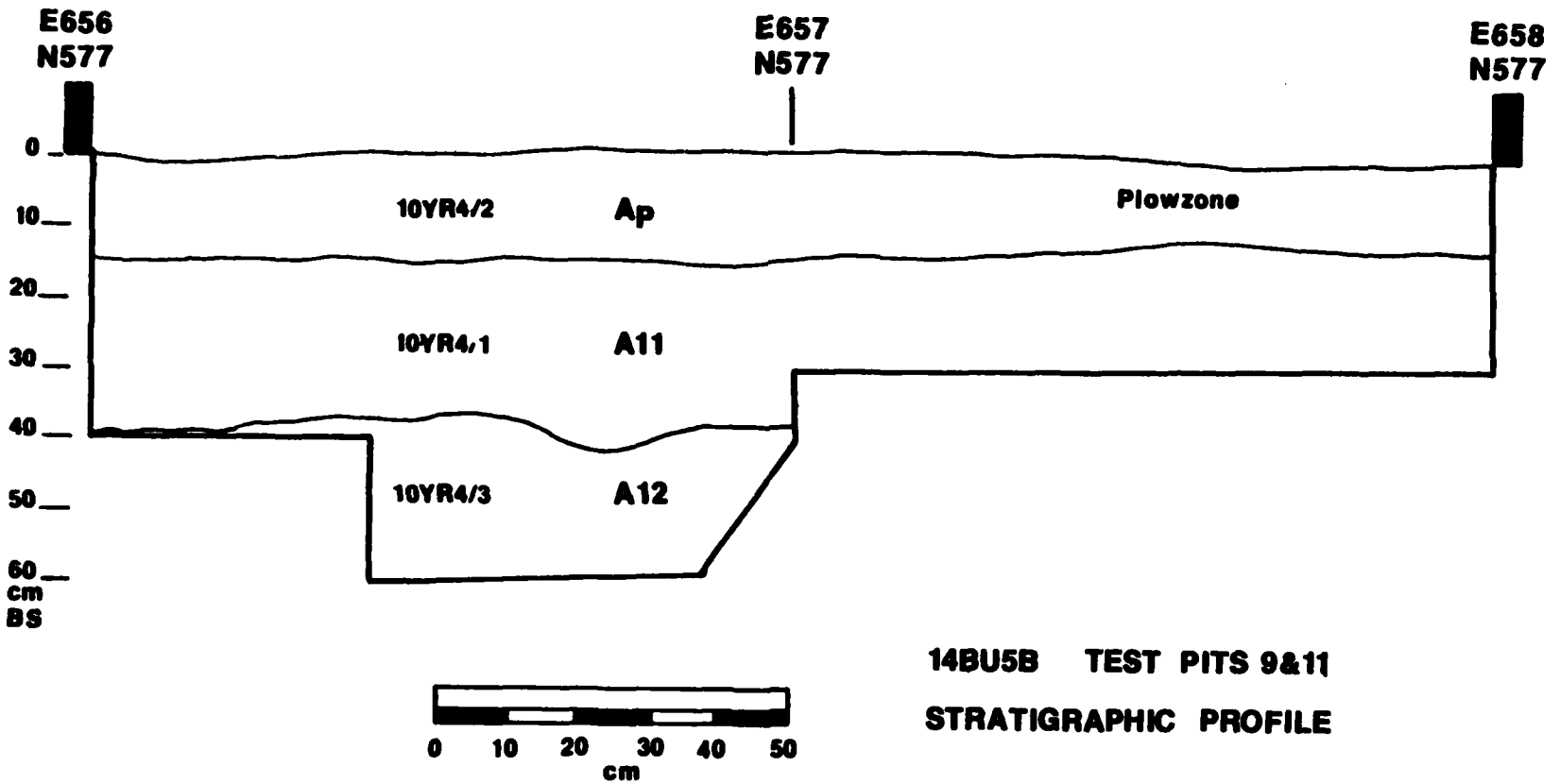
Test pits 10 and 12 were placed at the eastern margin of 14BU5B in an attempt to define the horizontal boundaries of the cultural component. Both of these units were excavated in arbitrary 10 cm. vertical levels below the plowzone to a depth of 50 cm. The plowzone was removed as a single 20 cm. level in both units. The vertical distribution of artifacts for both of these units is given in Table 1.22. From this table it can be seen that the majority of material at the eastern portion of Area B is confined within or just below the plowzone. The vertical profile of these units is very similar to that illustrated in Figure 1.17. Post hole augers placed at the base of these units to a depth of 1.5 meters below surface indicate that no buried cultural deposits exist to that level.

DISCUSSION

The test investigations at 14BU5B during the 1980 field season consisted of the placement of 5 additional 1.0 by 1.0 meter test pits. These test pits have reaffirmed the presence of the intact subplowzone cultural deposit which was first recorded in 1968 by Bastian (1979). The deposit is confined to the western portion of Area B and extends only to about 40 cm. below the present ground surface. The majority of the site is confined within the plowzone or upper 20 cm. The presence of a limestone feature, presumably a roasting pit,

FIGURE 1.17

Stratigraphic profile of test pits 9 and 11, 14BU5B.



14BU5B TEST PITS 9&11

STRATIGRAPHIC PROFILE

offered the opportunity to radio-carbon date the subplowzone Woodland deposit. Unfortunately, the date obtained from the two charcoal samples removed from the feature proved too modern. The boundaries of the site are fairly well established by the meander loop of Durechan Creek. The surface area of 14BU5B is estimated to be approximately 1 hectare. The area of the subplowzone cultural deposit is estimated to be only .25 hectares and is confined to the southwest portion of the site.

ARTIFACT ANALYSIS

No diagnostic artifacts were recovered from 14BU5B during the 1980 test investigations. The total sample of artifacts included 351 pieces of limestone weighing 1.5 Kg, 67 pieces of chipped stone, 2 fragments of unidentifiable burned bone, 2 small samples of charcoal and 14 pieces of burned earth. No ceramic material or floral remains were recovered from Area B in 1980.

Table 1.23 lists the chert types and the presence or absence of thermal alteration for the 67 pieces of chipped stone recovered from Area B in 1980. Florence A and Florence B chert types were the most often utilized at the site. Of these Florence A was three times as likely to be heat treated as was Florence B; indicating that this chert type required heat treatment to render it suitable for tool manufacture. Only 6 elements of Flint Hills Light Grey Chert were recovered from Area B of 14BU5. A single element of an unknown chert type completes the inventory recovered from 14BU5B in 1980.

The technoclasses represented by these chert types are given in Table 1.23. These include cortical chunks, intermediate flakes, noncortical chunks, bifacial trimming flakes and shaped tools. Combined, the technoclasses of intermediate flakes and non-cortical chunks represent 80 percent of the total sample. These elements, together with the 6 bifacial trimming flakes indicate that tool manufacture and maintanence was an important activity at the site.

TABLE 1.23 Chert types and thermal alteration of chipped stone technoclasses, 14BU5B.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		MISC/IND		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORTICAL CHUNKS	-	5	-	-	-	-	-	-	-	5
TOTAL	5		-		-		-		5	
INTERMEDIATE FLAKES	3	6	1	17	-	5	-	-	4	28
TOTAL	9		18		5		-		32	
NONCORTICAL CHUNKS	9	6	3	3	-	-	-	1	12	10
TOTAL	15		6		-		1		22	
BIFACIAL TRIMMING FLAKES	3	1	-	2	-	-	-	-	3	3
TOTAL	4		2		-		-		6	
SHAPED TOOLS	-	-	-	1	-	1	-	-	-	2
TOTAL	-		1		1		-		2	
TOTALS	15	18	4	23	-	6	-	1	19	48
TOTAL	33		27		6		1		67	

The only two shaped tools recovered from Area B in 1980 consist of a scraper fashioned from Flint Hills Light Grey chert and a retouched flake of Florence B chert. Neither of these tools are illustrated. The scraper measures 24 mm. in maximum length, 26 mm. in maximum width, is 7 mm. thick and weighs 3.1 grams. The tool is steeply retouched at the distal end and the working edge has an edge angle of 78 degrees. This edge angle is within the range that Wilmsen (1979:71) postulated was suitable for bone working, woodworking, and heavy shredding. The tool was recovered from the plowzone of Test Pit 8.

The retouched flake of Florence B chert was recovered from the plowzone of Test Pit 11. It measures 26 mm. in maximum length, 14 mm. in maximum width and is 4 mm. thick. Only one lateral margin of the flake is steeply retouched. It has an average edge angle of 68 degrees which is suitable for a wide variety of cutting and scraping activities. The distal portion of the flake converges to a sharp point which could have been used as a graver. The flake weighs 1.2 grams.

A Scallorn projectile point which was recovered from Area B in 1968 and is illustrated by Bastian (1979) indicates that hunting activities were carried out from the site. The recovery of ceramics from Area B in 1968, combined with the presence of the roasting pit excavated in 1980, indicate that cooking and perhaps storage of food were activities carried out at the site as well. Bastian (1979:48) recorded the presence of a post mold which may have represented the presence of a structure at the site.

The results of the artifact analyses indicate that a number of activities took place at the site. Tool manufacture and maintenance are indicated by the presence of a large number of intermediate elements in 1980 as well as by the 6 bifacial trimming flakes. Heat treatment of chert probably took

place at the site as well since none of the 5 cortical chunks recovered in 1980 are heat treated and heat treated specimens of intermediate flakes, non-cortical chunks and bifacial trimming flakes were recovered from the site. This indicates that heat treatment was applied only after the chert was selected and initially reduced for tool manufacture.

Bastian recovered 2 cores, 2 bifaces, 3 utilized flakes and one scraper from Area B of 14BU5 in 1968. These tools would have been suitable for wood-working, hidescraping, butchering and other food processing activities which were most likely carried out at the site.

DISCUSSION

As already noted Bastian (1979) recovered ceramic material from the site. He also excavated a post mold which provides limited evidence that a prehistoric structure existed at the site. Thus it is inferred that 14BU5B was relatively permanently, but perhaps seasonally, occupied since it would have been susceptible to spring and early summer flooding. The site was probably occupied in the late summer, fall, or winter when the mast resources of the gallery forests would have made it an attractive habitation site.

Further archaeological work of a limited nature is recommended for Area B of 14BU5. The intact Woodland cultural deposit recorded by Bastian (1979) and documented in 1980 should be further investigated with the use of heavy machinery. The plowzone of the western half of Area B should be stripped off to expose any features which may be present. This work was originally planned for 1980, but the saturated state of the soil made it impossible to get heavy machinery into the field before the field season ended. The site will be completely innundated by the conservation pool of the proposed El Dorado Lake and the opportunity to perform this work is limited.

14BU5C

PHYSICAL SETTING

Area C of 14BU5 is located nearest to the confluence of Durechen Creek and the Walnut River (Figure 1.13). It is situated on a slight rise or ridge in the floodplain which is shared by Durechen Creek and the Walnut River. At the time of the 1980 investigations the site was in wheat stubble and surface visibility was poor, ranging between 25 and 50 percent. A pedestrian reconnaissance of the surface of the area led to the mapping of the boundaries of the surface scatter. The perimeter or boundaries of this scatter of lithic debris, illustrated in Figure 1.13, is a good approximation of the site's boundaries.

A total of 5 1.0 by 1.0 meter test pits were placed within or adjacent to the boundaries of this scatter of artifacts in an attempt to determine the horizontal and vertical extent of the site.

Test Pits 1 and 2 were placed outside the western edge of surface scatter. Both of the units were excavated in arbitrary 10 cm. vertical levels below the plowzone to a depth of 40 cm. below the surface of the Durechen Creek floodplain. The plowzone was removed as a single 20 cm. unit. The vertical distribution of artifacts within Test Pits 1 and 2 is given in Table 1.24. The only material recovered from these units consisted of limestone and gravel of dubious cultural origin. No chipped stone artifacts were recovered from either of these two Test Pits. Thus the units are outside of the site boundaries and provide supportive evidence that the surface scatter represents the limits of the site.

Test Pit 3 was placed at the eastern edge of Area C at the top of the ridge on the floodplain. The unit was placed in an area where several tools

TABLE 1.24 Vertical distribution of artifacts in test pits 1 and 2, 14BU5C.

Level	Chert	Limestone	Gravel	Total
0-20 cm. (Plowzone)	0	11	2	13
20-30	0	4	8	12
30-40	0	7	8	15
TOTAL	0	22	18	40

TABLE 1.25 Vertical distribution of artifacts in test pit 3, 14BU5C.

Level	Chert	Limestone	Gravel	Total
0-20 cm. (Plowzone)	0	6	6	12
20-30 cm.	1	0	0	1
30-40 cm.	1	0	0	1
TOTAL	2	6	6	14

TABLE 1.26 Vertical distribution of artifacts in test pits 4 and 5, 14BU5C.

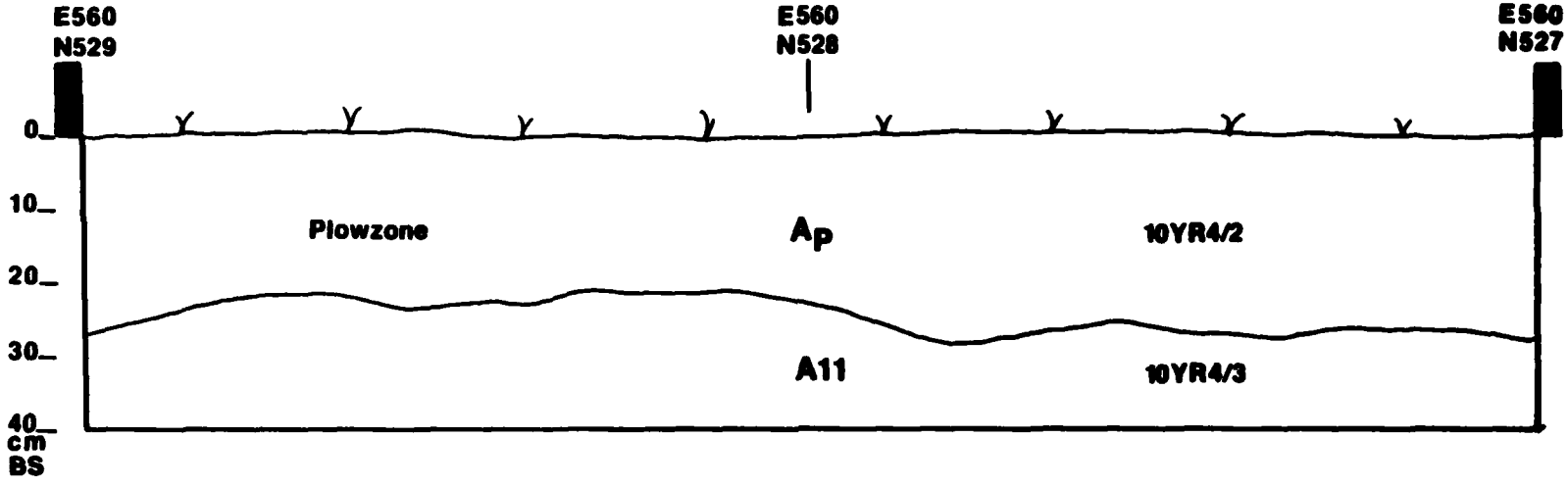
Level	Chert	Limestone	Gravel	Total
0-20 cm. (Plowzone)	37	65	40	142
20-30 cm.	5	34	29	68
30-40 cm.	1	16	0	17
TOTAL				

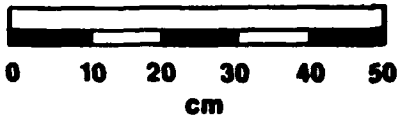
were located on the surface of the site. The Test Pit was excavated in arbitrary 10 cm. levels below the plowzone to a depth of 40 cm. below surface. The plowzone was removed as a single 20 cm level. The vertical distribution of artifacts within this unit is given in Table 1.25. The majority of the material recovered from the unit consisted of limestone and gravel which were confined to the plowzone. The only chipped stone elements recovered from Test Pit 3 are two small chert chips which measure less than 2 cm. in maximum dimension. These two chips were recovered from between 20 and 40 cm. below the surface. Their small size and the absence of any other cultural material within these two levels indicates that the chert chips migrated downward by natural processes.

Test Pits 4 and 5 are contiguous units. They were placed at the north central portion of Area C adjacent to the southern bank of Durechen Creek. The units were excavated in arbitrary 10 cm. vertical levels below the plowzone to a depth of 40 cm. below surface. The plowzone was removed as a single 20 cm. level. The vertical distribution of artifacts within Test Pits 4 and 5 is given in Table 1.26. The majority of the artifacts recovered from these two units are confined within the plowzone which extends down as far as 30 cm. This downward extension of the plowzone is illustrated in the stratigraphic profile of Test Pits 4 and 5 presented in Figure 1.18. The upper 20 to 30 cm., or plowzone, consists of a loose alluvial sediment which is dark greyish brown (10YR4/2) in color. The plowzone is underlain by a silty clay loam A11 horizon which is dark brown (10YR4/3) in color and extends to the base of the unit. A post hole auger test was made at the base of test pit 4 to a depth of 1.5 meters below surface. No evidence of a buried cultural component was encountered by the auger test.

FIGURE 1.18

Stratigraphic profile of test pits 4 and 5, 14BU5C.





14BU5C TEST PITS 4&5
STRATIGRAPHIC PROFILE

The stratigraphic profile of Test Pits 4 and 5 which is illustrated in Figure 1.18 is representative of the stratigraphy recorded in the other 3 test pits placed in Area C in 1980. These profiles correspond closely to the typical Verdigris Soil Series profile illustrated and described by the U.S.D.A. (1975:21).

DISCUSSION

The test excavations within Area C of 14BU5 have demonstrated that the site is primarily confined to the plowzone and has been disturbed by modern and historic farming practices. Even though the farming activities have most likely extended the perimeter of the surface scatter beyond the actual site boundaries as they existed in prehistory the perimeter of the surface scatter, illustrated in Figure 1.13, provides a good estimate of the areal extent of the site. The area contained within this perimeter is approximately 1 hectare.

ARTIFACT ANALYSIS

The large amount of unworked stone recovered from the 5 test pits consists of limestone and gravel. The gravel is probably not of cultural origin since it occured throughout Test Pits 1 and 2 which were devoid of cultural material.

The limestone recovered from the site consists of 143 pieces weighing 337.2 grams. Only 35 pieces, weighing 123.5 grams, of the limestone appear to have been heat treated. All of the heat treated limestone was encountered in Test Pits 4 and 5. The fact that these units also produced the greatest number of chipped stone artifacts indicates that the limestone was intentionally fired.

Table 1.27 lists the chert types as well as the presence or absence of thermal alteration for the 49 chipped stone artifacts recovered from both the surface and the 5 Test Pits within Area C of 14BU5. Florence A chert is the numerically dominant chert type at 14BU5C. It is represented in the sample twice as often as Florence B which is the next most prevalent chert type represented at 14BU5C.

Both the Florence A and Florence B chert types are represented by the technoclasses of intermediate flakes, non-cortical chunks, bifacial trimming flakes and shaped tools. Only Florence A chert is represented by the technoclass of cortical chunks and only Florence B chert is represented by the technoclasses of decortication flakes and cores. The remaining chert type found at 14BU5C is Flint Hills Light Grey chert which is represented by a single non-cortical chunk.

The only evidence of the initial reduction of raw materials at 14BU5C consists of 5 cortical chunks and two decortication flakes. These seven elements comprise 14 percent of the total sample recovered in 1980.

The single core recovered in 1980 in conjunction with the 17 intermediate flakes and 10 non-cortical chunks demonstrates that flake production was an important activity at Area C. These elements combined represent 57 percent of the total sample of chipped stone artifacts recovered from 14BU5C in 1980.

The nine shaped tools and five bifacial trimming flakes recovered from Area C indicate that the manufacture and maintenance of chipped stone tools was also an important activity undertaken in this area of the site. These elements represent 29 percent of the total sample recovered from Area C.

Thus it appears that, with the exception of tested cobbles, all stages of lithic procurement and manufacture took place at Area C of 14BU5. The

TABLE 1.27 Chert types and thermal alteration of chipped stone technoclasses, 14BU5C.

TECHNOCLASS	FLORENCE A		FLORENCE B		LIGHT GREY		TOTAL	
	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT	HEAT	NO HEAT
CORES	-	-	-	1	-	-	-	1
TOTAL	-		1		-		1	
CORTICAL CHUNKS	3	2	-	-	-	-	3	2
TOTAL	5		-		-		5	
DECORTICATION FLAKES	-	-	-	2	-	-	-	2
TOTAL	-		2		-		2	
INTERMEDIATE FLAKES	6	3	2	6	-	-	8	9
TOTAL	9		8		-		17	
NONCORTICAL CHUNKS	5	3	-	1	-	1	5	5
TOTAL	8		1		1		10	
BIFACIAL TRIMMING FLAKES	2	2	-	1	-	-	2	3
TOTAL	4		1		-		5	
SHAPED TOOLS	3	3	1	2	-	-	4	5
TOTAL	6		3		-		9	
TOTALS	19	13	3	13	-	1	22	27
TOTAL	32		16		1		49	

initial reduction of raw material is represented by the decortication flakes and cortical chunks. The large number of intermediate elements and the single core indicate that flake production also took place within this area of the site. The presence of shaped tools and bifacial trimming flakes document that the tools were manufactured and maintained as well.

Of the 21 elements recovered from Area C of 14BU5 which were heat treated 19 of them are of Florence A chert and the remaining 3 are of Florence B chert. This difference in the heat treatment of the two chert types indicates that while Florence A was the preferred chert type it often required heat treatment to render it suitable for prehistoric tool manufacture. It appears that Florence A chert was heated during the initial stages of tool production as indicated by the presence of heat treated cortical chunks of this material. Florence B, on the other hand, appears to have been heat treated only after it was selected for tool use. The only technoclasses which are heat treated within this chert type are intermediate flakes and shaped tools.

The shaped tools recovered from 14BU5C in 1980 consist of one projectile point, 2 biface fragments, and 6 retouched flakes.

The small projectile point was recovered from the plowzone of Test Pit 4. This specimen, illustrated in Figures 1.19A and 1.19B, is essentially identical in size and shape to the Scallorn projectile point recovered from Area B of 14BU5 in 1968 (Bastian 1979:51). The Scallorn point recovered from Area C in 1980 was manufactured from heat treated Florence A chert. It measures 23.0 mm. in maximum length. The width of the blade at the shoulders of the specimen is 10.0 mm. The stem of the point is 4.0 mm. long. The stem is 4.0 mm. wide at the notches and 7.0 mm. wide at the base. The maximum thickness of the point is 3.0 mm. and it weighs 0.4 grams. Criteria developed by

FIGURE 1.19

Shaped tools recovered from 14BU5C: (A,B) opposite lateral views of a Scallorn point; (C, E) biface fragments.

a

b

c

d

0 mm 30

Thomas (1978) and Fenenga (1953) classify both of the Scallorn points recovered from Areas B and C as arrow points rather than atlatl dart points. Thus it can be concluded that the prehistoric inhabitants of Areas B and C of 14BU5 utilized the bow and arrow for hunting and defense. The Scallorn point recovered from 14BU5C is the only diagnostic artifact recovered from this area of the site. The presence of this specimen enables the component at 14BU5C to be tentatively assigned to the Woodland cultural tradition. It also promotes the speculation that Area C and Area B were occupied at the same time or by the same group of people.

The two biface fragments recovered from Area C in 1980 were found on the surface of the site near Test Pit 3. These two specimens were manufactured from Florence A chert and are illustrated in Figures 1.19C and 1.19D. The larger of the two biface fragments is a proximal fragment which exhibits cortex on what apparently is the dorsal surface. The cortex is visible in Figure 1.19C, indicating that the tool was manufactured from a relatively unaltered piece of raw material and was not completely flaked during manufacture. It is possible that the tool broke during manufacture and was discarded as an incomplete fragment. However, the retouch which is present along the lateral margins of this tool indicates that it was resharpened and probably broken during use. This proximal biface fragment measures 73.0 mm in maximum length, 51.0 mm in maximum width, 24.0 mm in maximum thickness and weighs 124.5 grams. The edge angles of the lateral margins average 65 degrees.

The second biface fragment recovered from Area C is a medial fragment which is illustrated in Figure 1.19D. This specimen is completely flaked on both sides and measures 32.0 mm in maximum length, 21.0 mm in maximum

width, and 11.0 mm in maximum thickness. It weighs 9.3 grams. The edge angles of the lateral margins of this tool average 60 degrees, which places it, along with the larger proximal biface fragment discussed above, within the range of edge angles postulated by Wilmsen (1970:71) to have functioned as heavy cutting implements suitable for a variety of tasks.

The six retouched flakes recovered from Area C of 14BU5 complete the tool inventory. These tools range in maximum dimension from 2.7 to 4.2 cm and exhibit retouch on their lateral or transverse margins. They can be separated into two functional classes based on the criteria of working edge angle, working edge shape and working edge placement. Of the six retouched flakes recovered from Area C, four are classified as scrapers while two are classified as cutting tools.

SUMMARY

The analysis of the chipped stone assemblage recovered from Area C of 14BU5 in 1980 indicates that while all stages of lithic reduction were performed at the site, flake production was the predominant activity. The presence of a Scallorn projectile point indicates that the bow and arrow were utilized by the prehistoric inhabitants and that hunting activities were carried out from this area of the site. The presence of a small number of bifacial trimming flakes and the two biface fragments demonstrate that tool manufacture and maintenance were also performed at the site. The edge angles of the bifacial tools and retouched flakes indicate that hide scraping, boneworking, woodworking, and other processing and maintenance activities were probably carried out at this area of the site as well.

The test excavations conducted at Area C of 14BU5 have demonstrated that the cultural component is confined to within or just below the plowzone.

As such, the component has been disturbed by historic and modern agricultural activities. The cultural component of Area C of 14BU5 has been assigned to the Woodland cultural tradition on the basis of a single Scallorn projectile point. The recovery of a Scallorn point from Area B in 1968 raises the possibility that these two areas of 14BU5 were occupied by the same group of people.

Area C will be completely innundated by the conservation pool of El Dorado Lake. Given the low artifact density encountered on the surface of the site and the shallow depth of the deposit, no further work is recommended at Area C of 14BU5.

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CHAPTER 2

FURTHER INVESTIGATIONS OF THE HISTORIC PERIOD IN THE EL DORADO LAKE AREA

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INTRODUCTION

The Phase IV, historical archaeological data recovery program at El Dorado Lake undertaken by the University of Kansas Museum of Anthropology was a continuation of an ongoing program begun in 1978. An historical archaeologist and three excavators conducted an archaeological testing program designed to locate the early historic components at two sites: the Doc Lewellen site, 14BU1005, and the Donaldson site, 14BU1008. These actions were followed by renewed efforts at the New Chelsea site, 14BU1007, to culminate the field season. The results of these investigations are expatiated in the following report.

Cultural resource management studies of the historic period at El Dorado Lake, are mandated by the National Historic Preservation Act of 1966 and the National Environmental Policy Act of 1969. Results of these undertakings are to evidence compliance with Executive Order 11593, entitled, Protection and Enhancement of the Cultural Environment. Funding is provided by the Reservoir Salvage Act of 1960 as amended by the Archaeological and Historic Data Preservation Act of 1974.

The historic resources of the El Dorado Lake area constitute a major cultural resource for the people of Butler County and the State of Kansas. Were it not for the historic sites project of the Museum of Anthropology, a significant portion of this area's history would have been destroyed by the lake and valuable anthropological data would have been lost forever.

Kansas was part of the final frontier of the continental United States. At the time it was settled (1857), Butler County was among the westernmost occupations in the state (then a territory). The lushness of the Walnut

Valley attracted settlers who established a town and county seat, Chelsea, as well as numerous outlying nuclear family settlements. Butler County's fortunes were generally similar to many Kansas counties and other Plains settlements. El Dorado Lake is impacting the physical center of this important part of Plain's history.

From an anthropological standpoint we know little about this final frontier period. Almost without exception, historical archaeology on the Plains has focused on military sites and historic Indian settlements (Baker 1978). In Kansas, there has never been an archaeological project that explored the complexities of Euro-American town and rural occupations. By studying the extinct Butler County town of Chelsea and its surrounding nuclear family settlements, this project has contributed to an understanding of the lifeways and processes of the more than 2800 other towns that were established and failed during the settlement of Kansas. The project provides the opportunity to explore the concept of community, to examine the economic relationships between town and country and town and world, to understand the organization and development of an historic town, and most importantly, how such towns died and the effect this had on an area. In addition, the data being accumulated has bearing on historical problems such as the Turner Thesis (Turner 1894), McKitrick-Elken's Thesis, and the cultural geography of frontier towns.

Beyond the historic and scientific potentials (although this project has demonstrated that these are not mutually exclusive goals) of the area, the Museum has endeavored to be sensitive to the interests of Butler County's residents. As stated earlier, the lake is impacting the very area where Butler County's history began. Many of the persons displaced by the lake are direct descendants of the original settlers and still occupied the lands acquired by their ancestors. The historical archaeology program has been

structured to achieve the professional goals of mitigation and management but has been tempered with a concern to insure the preservation of certain physical manifestations of Butler County's history.

PREVIOUS WORK

The historical archaeology project was a development of the Phase I cultural resource survey. Although historic resources were addressed in the research design (Leaf 1976), no personnel were specifically assigned to inventory and evaluate historical properties during the 1977 survey. During the course of the El Dorado Lake project area survey, it became obvious that substantial numbers of historical resources were present. At the Museum's suggestion, the Corps requested a proposal to address the historical resources. The submitted proposal was accepted.

During the summer of 1978, the Museum of Anthropology initiated the historical resources program. Using documentary sources, oral history, and some of the findings from the prehistoric site survey, a total of 88 historic sites were identified. The preliminary list was reduced to 66 sites that were at least 50 years old and/or that were potentially eligible for the National Register of Historic Places. Each of these sites was then subjected to a more concerted research effort (Roberts and Wilk 1981). Fifteen of the historic sites were determined to have potential archaeological significance. Six of the fifteen, 14BU1001, 14BU1002, 14BU1003, 14BU1005, 14BU1006, and 14BU1007, were tested (Roberts 1981b). Results of the testing indicated a complex archaeological data base was present among the historic sites.

In 1979 the historical archaeology program continued. Four additional historic sites were tested: 14BU1004, 14BU1008, 14BU1009, and 14BU1012 (Brown 1981). Large scale excavations were undertaken at the New Chelsea site, 14BU1007, centering on one of the town's blacksmith shops (Roberts 1981).

More intensive documentary research focusing on the town of Chelsea and its development was also undertaken (Thomas 1981).

1980 PREVIOUS WORK

The 1980 historical archaeology program at El Dorado Lake was a small scale version of what had originally been projected for Phase IV. From the outset, the ultimate goal of the historical archaeological investigation has been to test excavate a representative sample of sites from the historic period (Roberts 1981a:465). Collections had accrued during the previous excavations from all the major type sites except habitations from the earliest settlement period (ca. 1858-1867). Therefore, the 1980 investigation was oriented towards locating deposits from the earliest period.

A review of the documentary data accumulated in the course of the project indicated two sites that had the best potential for encountering deposits related to the early settlement period: the Doc Lewellen site, 14BU1005, and the Donaldson site, 14BU1008. Both sites were among those settled by the first group of arrivals in 1857. Each had been occupied for less than 12 years and then abandoned, which provided well bracketed deposits. Subsequent occupation by the inhabitants of the two sites had already been excavated which meant there was an ideal opportunity to compare continuity in material culture. A final significant factor was the availability of written and informant reported descriptions of the original occupations' locations.

The 1980 field season was also used to implement a controlled surface collection strategy at the New Chelsea site, 14BU1007. Previous excavations had indicated that although much of the site had been disturbed, surface collections could still be used to define the town's layout. By using a controlled mapping and surface collecting procedure, the goal for the Phase IV investigation was to provide a quick and efficient inventory of archaeological deposits in the southern half of the town.

THE DOC LEWELLEN SITE

The Doc Lewellen site, 14BU1005, occupies both banks of the Walnut River (Fig. 2.1). The site is comprised of three horizontally stratified deposits associated with three separate residences occupied by the Doc Lewellen family and descendants between 1857 and the present. During Phase II, the second of the three Lewellen occupations was excavated (Roberts 1981a), and an unsuccessful attempt was made to locate the original occupation. Phase IV's investigation was an extensive on-the-ground survey and testing procedure designed to identify the original Lewellen family homesite.

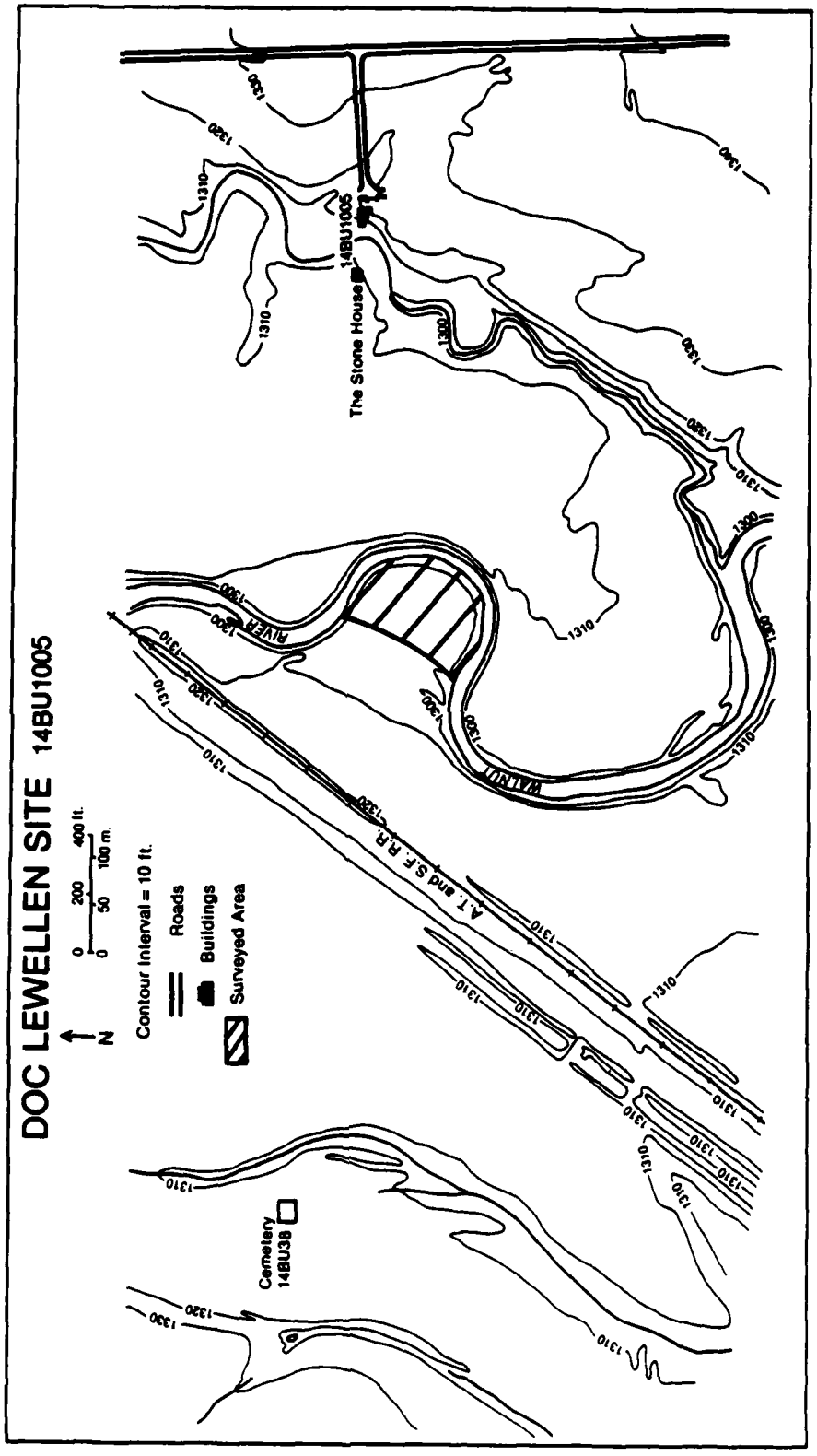
HISTORY

Zadoc Lewellen, more commonly refered to as "Doc", was born in Fayette County, Pennsylvania in 1826. He was raised in what is now West Virginia near the Pennsylvania border. It was in 1855 that Lewellen and his wife began their trek west.

Lewellen first settled in Iowa in 1855, but his stay there was brief. In 1857 the Lewellen's joined with the Charles Jefferson family and moved to Butler County, Kansas to take advantage of newly opened government lands. Once there, Lewellen established a residence in a bend of the Walnut River on the west bank.

Butler County in the mid-19th Century presented an often hostile appearing face to arriving settlers. The gently undulating hills with minimal soil cover, the all pervasive grass cover and the limited tracts of timber combined to form an alien looking landscape to settlers who were more familiar with woodland environments. As a response to this foreign environment, pioneers such as Doc Lewellen tended to select for lands which were similar to those from which they came; i.e., the lowlands along the Walnut River and its tributaries where limited riparian forests existed.

Figure 2.1. The Doc Lewellen site.


DOC LEWELLEN SITE 14BU1005
Contour Interval = 10 ft.
N
0 200 400 ft.
0 50 100 m.
Roads
Buildings
Surveyed Area
The Stone House 14BU1005
A.T. and S.F. R.R.
Cemetery 14BU38
RIVER
WATER

Lewellen's first home in Butler County was a log cabin built in 1857. A description of the cabin has not survived, but it was probably a one or two room structure with a stone fireplace. The Lewellen's occupied their original homesite for eleven years, 1857-1868. A small family cemetary was established northwest of the homesite for two Lewellen infants who died in 1858 and 1860. (This family cemetary was designated 14BU38 and was translocated prior to the 1980 field season.)

During the occupation of the log cabin, Doc Lewellen became quite active in local development. He helped found and promote the original Butler County seat, Chelsea. In 1859 he was appointed sheriff of Butler County. From 1864-1867 he served as county commissioner and as a member of the school board. These duties were in addition to his establishing a successful farming and stockraising operation.

About the time that the town he helped found failed, Lewellen left the area. In 1868 he purchased a trading post on the Little Arkansas River from Henry Chisolm of cattle trail fame. Through this trading post Lewellen helped accomodate the new settlers arriving in Sedgewick County. During his stay in Sedgewick County Lewellen became one of Wichita's first merchants and actively participated in the town's development.

In 1872, Lewellen's wife died. Shortly thereafter he returned to his farm on the Walnut. Lewellen and his six children probably reoccupied the log house when they returned. However, in 1874 a large cut-stone cabin was erected on the east bank of the Walnut River opposite the log house. There Lewellen and his family lived until ca. 1885 when a 2½ story frame house was built east of the stone house. As was fairly typical of Butler County occupations, each succeeding house was located on higher ground.

Doc Lewellen died July 11, 1901. During his life, he had helped found two towns and conquer a frontier. A measure of his success as a farmer and stockman can be gleaned from the size of his farm: more than 1160 acres.

METHODOLOGY

The original Lewellen family homesite occupied a position on the west bank of the Walnut River (Fig. 2.1). Leo Hullihan, Lewellen family geneologist, reported that the cabin's foundation was still visible ca. 1900 according to his mother, Fencia Niola Lewellen Hullihan (daughter of Zadoc and his second wife Delilah). Hullihan thought that the cabin stood where the Atchison, Topeka and Santa Fe Railroad bridge formerly crossed the Walnut. The area south and east of the railroad in the bend of the river, had been carefully surveyed in 1978 without locating the homesite. A second report by Joe Lewellen, last owner of 14BU1005, put the cabin in the bend opposite the stone cabin. This was the area surveyed in 1980.

The Walnut River flows in a deeply incised channel as it passes 14BU1005. Erosion of the river bank continues and evidence of recent slumping is plainly evident. Except in areas that have been cleared for agricultural purposes, the banks are covered with a dense riparian forest and undergrowth. Without some clearing technique, ground visibility is zero to poor.

Survey of the west bank site began with an examination of the cutbank. Beginning at the railroad bridge surveyors followed the channel of the Walnut River looking for historic material eroding out of the bank or present in the river bed. It was realized that any material deposited in the river was unlikely to remain in place very long. Therefore, primary attention was given to the examination of the cutbank. The cutbank survey continued around the first full bend of the river south of the railroad bridge. No historic material was encountered.

The second phase of the survey consisted of an on-the-ground investigation of the wooded terrace. Four surveyors were placed at 10m intervals beginning at the treeline. They then traversed the area in a north-south direction. Every 10 paces a surveyor would stop, remove a shovel full of soil, dice it with the shovel blade, carefully examine the soil and the hole from which it was removed for historic material, then backfill the hole. This procedure was repeated until the entire wooded portion of the bend had been covered. Again, no historic material was encountered.

Power-augers and post-hole diggers were next used to test the area. A series of holes averaging 50cm in depth were placed in selected areas of the bend. The selected areas were broad flat expanses that would have been good for building a house, unusual depressions, and mounded areas. The results of this endeavor were also negative.

The final phase of the survey was to walk the plowed fields that occupied the space between the railroad and the treeline. This area had never seriously been considered as a possible location for the homesite but because of the negative results acquired in themore likely areas, this survey was undertaken. However, no historical material was encountered.

DISCUSSION

The failure to locate the site of the original Doc Lewellen homesite was frustrating. There are two possible explanations, however. The first possibility is that the house stood very close to the edge of the bank. Subsequent undercutting of the bank eventually led to a slumping and the deposit was washed away. A second possible explanation is that the cabin was located near the treeline of the 1978 survey area and was destroyed when the railroad was built. At the present time, the latter explanation seems more plausible.

THE DONALDSON SITE

The Donaldson site, 14BU1008, occupies an expanse of land north of Durechen Creek and east of the section road in Section 33. The site contains two horizontally stratified components: an early occupation in a log cabin which occurred from 1857 to 1869 and a later occupation centering around a stone house which began in 1869 and lasted until 1976. During Phase II the site was initially recorded and an architectural assessment of the stone house was made (Roberts and Wilk 1981). Extensive excavation of 32 square meters of deposits related to the stone house occupation was conducted during Phase III (Brown 1981). Investigation of the Donaldson site during Phase IV was aimed at locating the original home site occupation.

HISTORY

The Donaldson site derives its name from George F. Donaldson, the original owner of the site. Donaldson was born in Ohio but grew up in Indiana. As a young man he began his move west by relocating in Illinois. Then in the spring of 1855 Donaldson and his wife settled near Hull's Grove, Jefferson County, Kansas. This was a time of great civil strife in Kansas over the slavery question. Donaldson was an adherent of free-state principles and became an associate of General James Lane, the ardent free-state advocate (Andreas 1883: 1450). Because of his free-state convictions, Donaldson became a target of the border ruffians (a name given pro-slavery supporters who made forays into Kansas from across the Missouri state line). He was made a captain of a Free State Company and in turn a $500 reward was offered by the pro-slavery faction for his capture, dead or alive. Eventually, Donaldson was forced to flee, his home destroyed, and his family was driven from the land (Walnut Valley Times August 31, 1883).

In 1857, Donaldson and his family joined with his brother-in-law, Martin Vaught, and a small group of settlers at Emporia, Kansas. There they were told of a veritable garden of Eden on the Walnut River by a college professor who had explored the area. The group quickly decided that that was where they would settle. In this manner, Donaldson first came to Butler County.

When Donaldson arrived he selected a farmsite on Durechen Creek. Like Lewellen, Donaldson, apparently selected for a building site near or in the tree line along the stream. His first house was a log cabin, a description of which has not been discovered. It was probably a simple structure of one or two rooms with a limestone fireplace.

Donaldson immediately became active in establishing Chelsea, the county seat. Although his house stood outside the legal description of the town, his cabin was a center of activity for county government. He was also a financial investor in the town, having purchased 160 acres, or one-quarter of the town site, in 1860.

Politically, Donaldson was also active. From 1859 to 1860 he served as one of Butler County's first three county commissioners and the commission meetings were held at his house. In 1863 and 1867, Donaldson was elected as a representative from Butler County to the state legislature.

Although Donaldson had come to Butler County to escape his political problems he did not abandon his free-state principles. When the War-Between-the-States began, Donaldson became involved with recruiting and organizing Indians for the Northern cause. He was so successful that he received a commission as a First Lieutenant and served in that capacity throughout the war (Stratford and Klintworth 1970:21).

After the war, Donaldson appears to have been as staunch a supporter of Chelsea as he was of a free Kansas. The war years had not been good for Chelsea. At a time when the town needed to build and grow, the young men required for that work had been siphoned off to the war. Donaldson was faced with a town that had lost its position as county-seat and was steadily declining.

Chelsea was obviously something Donaldson did not feel inclined to let die easily. In part, this is understandable in as much as he had been so involved with the town. Not only had the county commission met on his property but one of his buildings also served as the county's first school and church.

In 1868, Donaldson replatted the town of Chelsea on his own property. That same year the post office was transferred to his house thereby legally relocating Chelsea (Mooney 1916:337). Although less than half the size of original Chelsea, the new town offered much promise: it was located on a main road, the Emporia Trail, which ran through Donaldson's property, and it had the dynamic support of George Donaldson.

Shortly after relocating Chelsea, Donaldson decided to build a new home. His new house was to be built of stone and was located very near the town of Chelsea. On November 3, 1869 Donaldson was killed in a logging accident which, according to one source, occurred while building his stone house (Mooney 1916: 338). In any respect, the house was finished and the Donaldson family abandoned the log dwelling. The stone house remained in the Donaldson family's possession until 1883 when Mrs. Donaldson died. After that, the property passed through several owners until finally acquired by the Corps of Engineers.

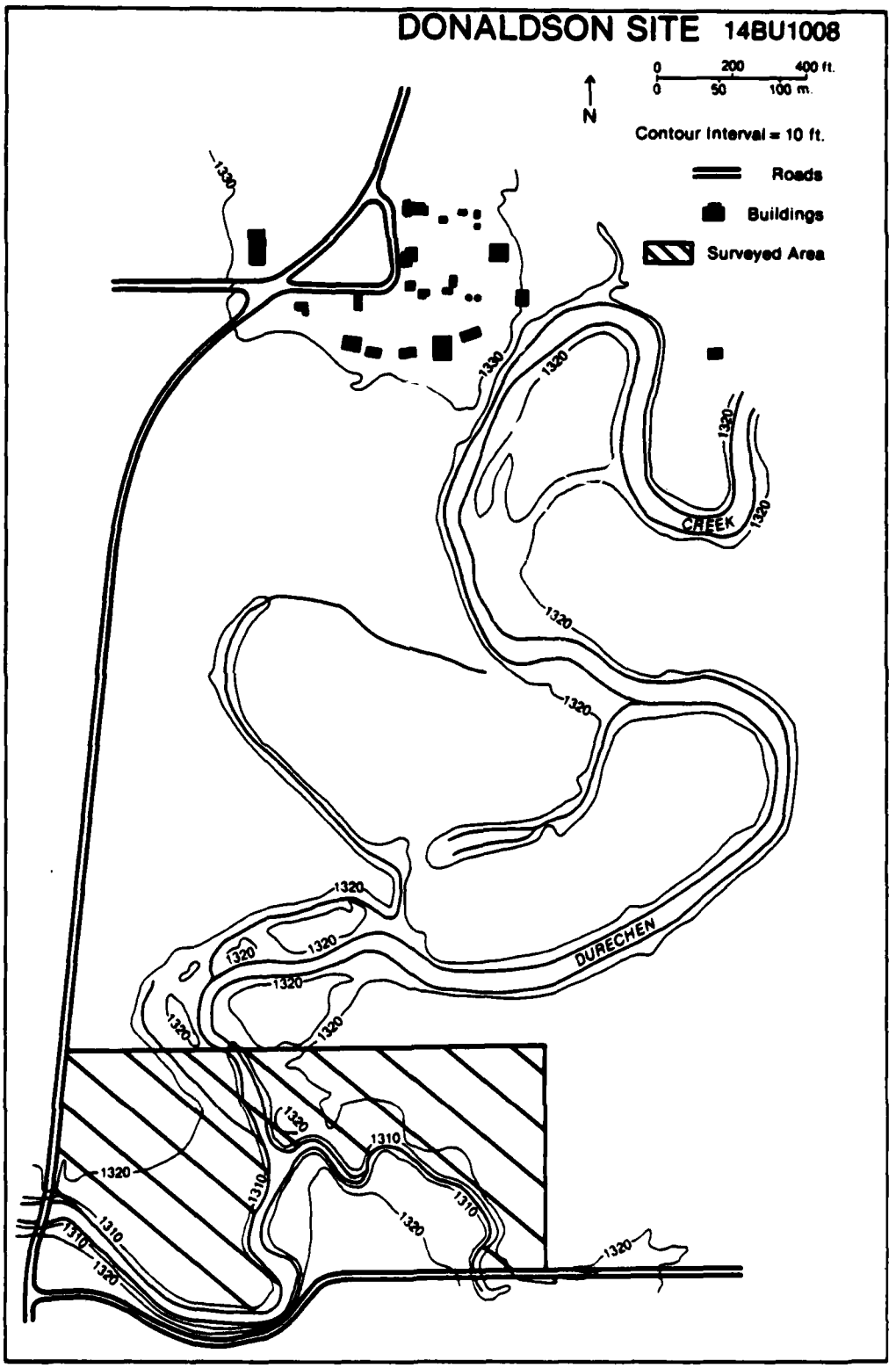
METHODOLOGY AND EXCAVATIONS

There were two areas of the Donaldson site of interest during the Phase IV investigation (Fig. 2.2). The first area was the location of the original homesite. The second was the location of the log structure which had been used for various social purposes during the earliest days of Chelsea. The field methodology that was employed in testing for these locations was based upon what was known from the documentary data.

An exact location for Donaldson's original log dwelling was not recorded in any of the historic sources so far encountered. It was known that Donaldson located himself along Durechen Creek. In as much as other settlers of this period located their dwellings on bottoms in or near the treeline, a similar pattern was projected for Donaldson. In addition, an historical account placed the site of the log cabin south and west of the stone house (Mooney 1916). Therefore, an on-the-ground survey of the land south of the stone house, east of the section road and north of Durechen Creek was undertaken. The procedure was the same as employed at the Lewellen site beginning with a cutbank survey of Durechen Creek from the section road to a point east of the stone house. Shovel cutting was employed in the areas where undergrowth was a problem. Power augers and post-hole diggers were also employed (the area affected by shovel cutting and the other procedures is cross-hatched in Fig. 2.2). The area from the treeline to the rise on which the stone house sits, was a wheat field. The wheat had already been harvested and the stubble baled, rendering visibility fair to good. This area was also intensively surveyed on foot. The results of all these procedures were negative. No historic materials indicating the presence of Donaldson's original homesite were encountered.

Before leaving the south field to concentrate on the area near the stone house, there was one final procedure to be employed. Curtis Salmon, a long-

Figure 2.2. The Donaldson site, south field survey area.


DONALDSON SITE 14BU1008
0 200 400 ft.
0 50 100 m.
N
Contour Interval = 10 ft.
Roads
Buildings
Surveyed Area
CREEK
DURECHEN
1320
1310
1300

time area resident, reported the remains of a notched log structure were visible in the south field early in the 20th century (ca. 1915-1920). Although there is not much topographic relief in the field, Mr. Salmon indicated that the structure was located on a very low rise (the approximate 1320 ft. contour line) just below the point where the field achieves its greatest constriction. Therefore, a series of four one by one meter excavation units were established at 10 meter intervals across the low rise (Fig. 2.3). Each of the units, designated XU 33 - XU 36 (continuing the sequence begun in Phase III) was taken down to 40 cm below the surface. No historic material was encountered. A power auger was used in XU33 to probe an additional 50 cm but the results continued to be negative.

Attention was next turned to the area around the stone house. Interest in this area was twofold: 1) the original homesite may have been on a portion of the rise southeast of the stone house; and, 2) the log structure which was so significant to original Chelsea possibly stood here.

As can be seen in Figure 2.2 the area around the stone house had been heavily developed. Test units were placed in areas which appeared to be the least disturbed (Fig. 2.4).

A foundation 5.2 m x 5.2 m, was encountered northeast of the stone house. Most of the limestone had been removed, however, the foundation trench remained fairly visible (Fig. 2.5). A series of test units were laid out crossing the foundation at right angles. Excavation quickly revealed that the foundation rested on a natural gravel lens approximately 15 cm. thick. The foundation had never been more than one stone deep and the gravel precluded any buried deposits.

Artifacts recovered during the excavations conducted at the Donaldson site are discussed below.

Figure 2.3. Excavation units in the south field of the Donaldson site.

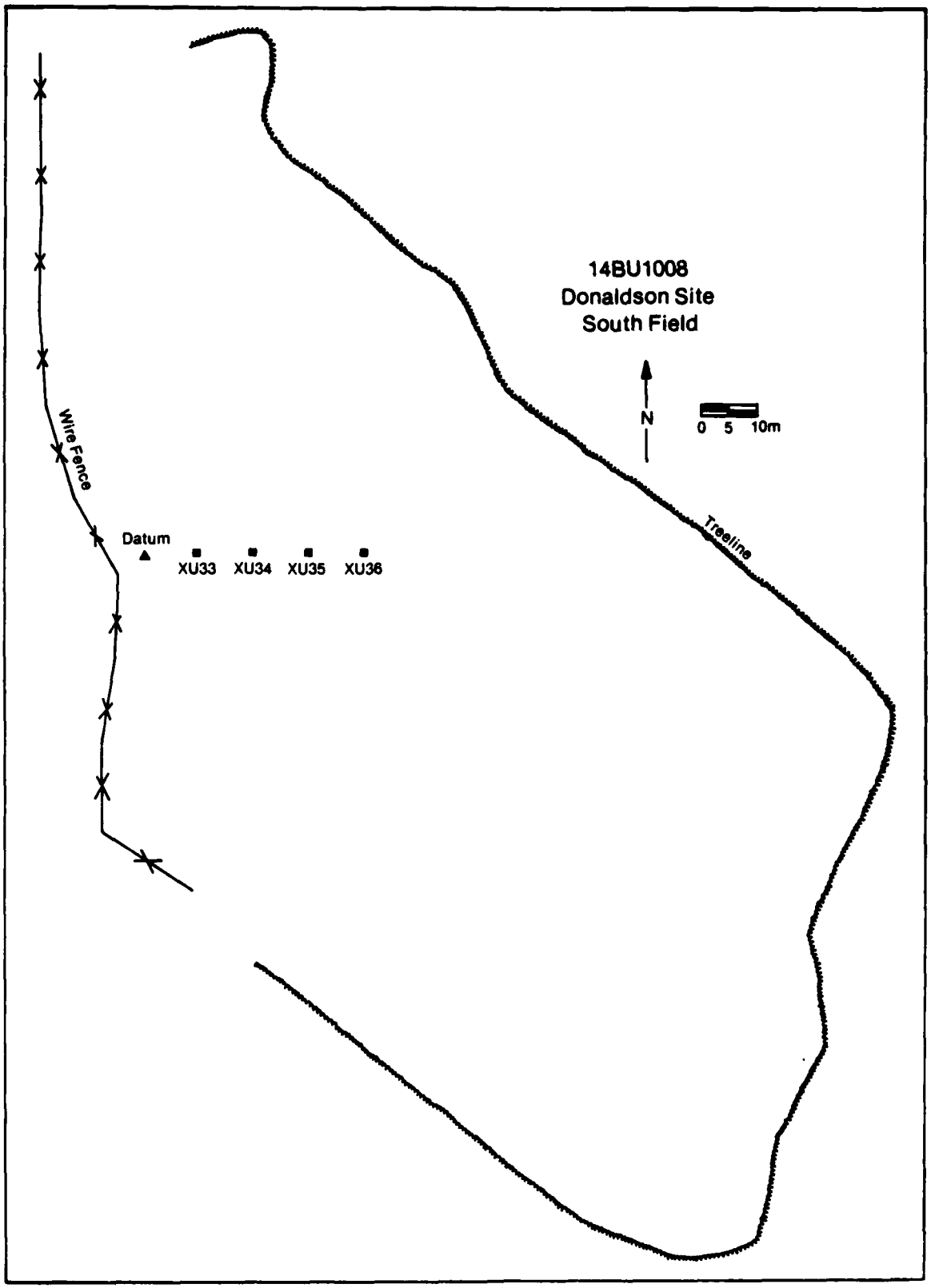

14BU1008
Donaldson Site
South Field
N
0 5 10m
Wire Fence
Datum
XU33
XU34
XU35
XU36
Treeline

Figure 2.4. Distribution of 1980 excavation units around the Donaldson stone house.

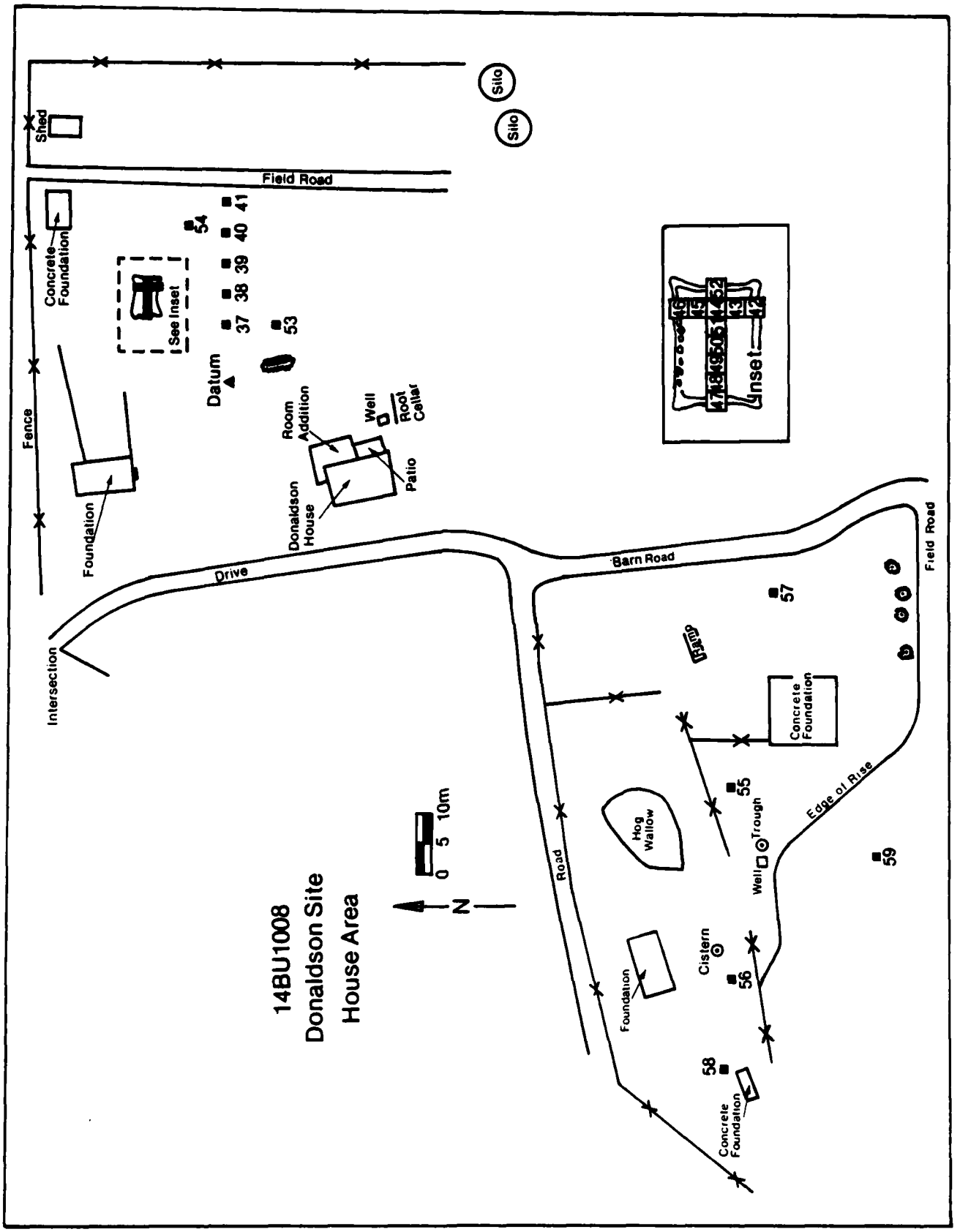
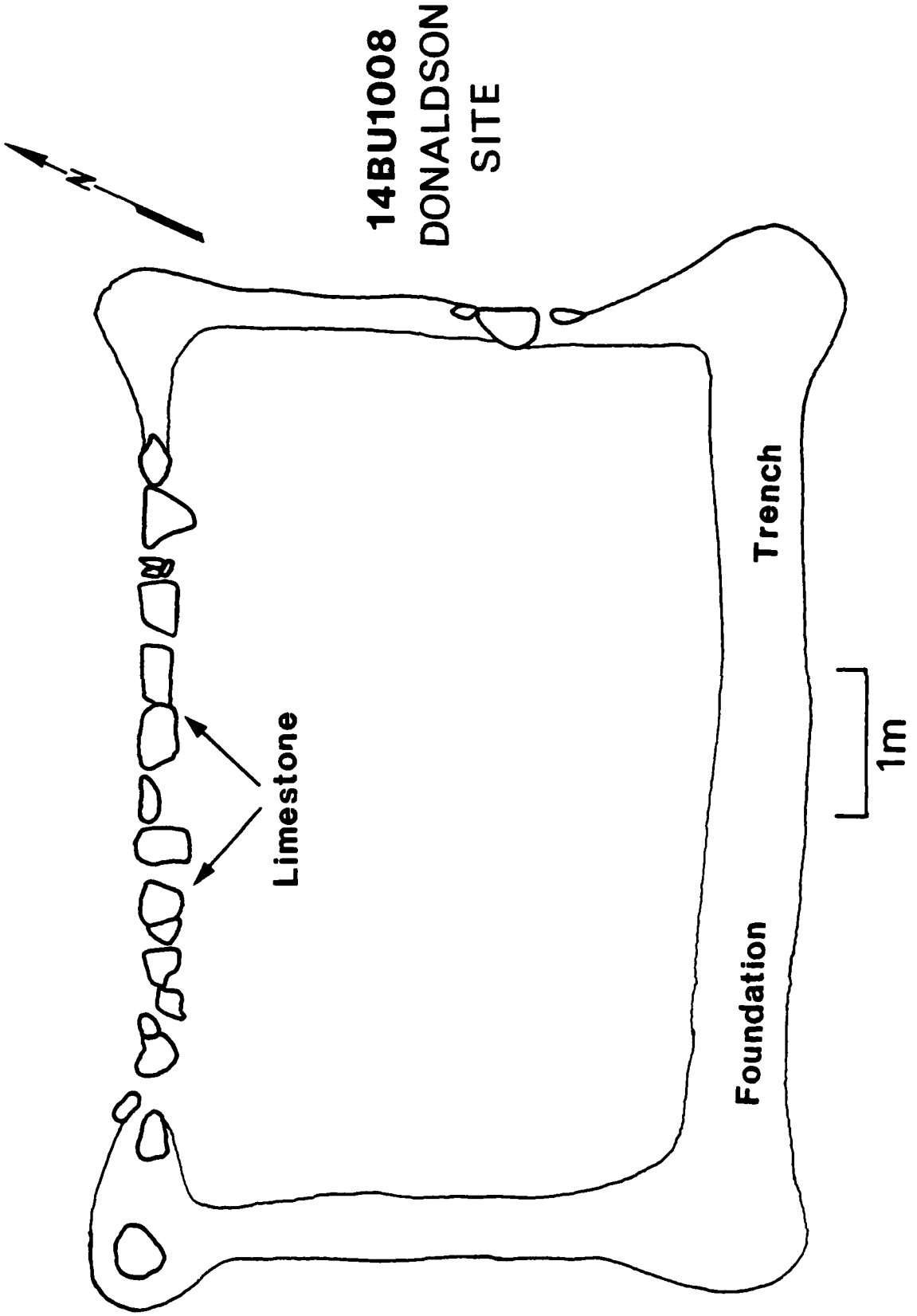

14BU1008
Donaldson Site
House Area
0 5 10m
N
Silo
Silo
Shed
Field Road
Concrete Foundation
See Inset
Fence
Foundation
Datum
Room Addition
Well
Root Cellar
Patio
Donaldson House
Drive
Intersection
Barn Road
Field Road
Inset
Ramp
Concrete Foundation
Hog Wallow
Trough
Edge of Rise
Road
Foundation
Cistern
Well
Concrete Foundation
37
38
39
40
41
53
54
55
56
57
58
59

Figure 2.5. Foundation tested during Phase IV at the Donaldson site.


14BU1008
DONALDSON
SITE
N
Limestone
Trench
Foundation
1m

ARTIFACTS

As has recently been pointed out (Sprague 1981), the question of how to type historic artifacts presents the archaeologist with a question of ponderable proportions. Classification by raw material tends to mask shared functions or associations among artifacts (for example, clothes buttons are used for basically similar tasks but a raw material emphasizing typology would sort them into classes of bone, shell, brass, etc.). At the same time, a functionally oriented typology must contend with multi-functional artifacts (for example, a chain could be part of a harness, wrench, wagon gate assembly, fence latch, etc.). Functional classification, however, tends to the preferred system and some complex typologies have been proposed (Buckles 1978; Sprague 1981).

The classification scheme used in the historic sites program at El Dorado Lake is a hybrid of raw material and functional typologies. This scheme developed from the nature of the material that was being recovered. Much of the historical archaeological record at El Dorado Lake had been disturbed. Most of the artifacts that were recovered were small fragments. In many instances, the only characteristic that a large number of artifacts shared was their raw material. Therefore, the basic attribute in the typological hierarchy is raw material. If the function of an artifact can be determined, it is categorized as a member of an assemblage or set. Assemblages are generally of two types: activity sets (tool assemblages used in specific work behaviors such as metal working, woodworking, etc.) and use sets (tool assemblages that serve similar functions in different activities, i.e. nails, nuts and bolts). In the following artifact descriptions ceramics are always treated as a distinct group; glass is differentiated as "flat" (i.e. window glass) or "bottle" (any non-flat or colored glass); and metal is the most

explicitly typed. When an artifact is multifunctional, its assignment to a particular class is based on context.

Flat Glass (n=7)

The flat glass assemblage from 14BU1008 in 1980 consisted of seven fragments: four, clear, and three green tinted. The distribution is shown in Table 2.1.

Bottle Glass (n=49)

A total of 49 bottle glass fragments were recovered during Phase IV. The distribution of bottle glass is shown in Table 2.2. Only two bottle neck fragments were recovered. Both came from the surface near the foundation and had seams that went all the way to the lip. Two specimens, both from Test Pit 43, bore embossing. An aqua fragment bore "SYP". An amber fragment carried the number, "32". The only other possibly significant bottle fragment was a portion of a milk glass jar lid liner from Test Pit 53.

Ceramics (n=14)

Fourteen historic ceramic sherds were recovered at the Donaldson site. Table 2.3 provides a break down of types and distribution. The three electrical insulator types testify to the continued occupation of this site into the 20th century. All were recovered near the foundation. The Copper Luster Tea Leaf Pattern sherd is a fragment of a coffee cup produced by Alfred Meakin under that type name. Four other specimens recovered in 1979 indicated that an entire service of this type may have been present (Anderson 1981:138). This was an expensive ware in the 19th century and can be interpreted as a marker of the Donaldson's wealth.

Agricultural Implements (n=2)

Two artifacts generally used in an agricultural context were recovered: a rake fragment and a piece of fence wire (Table 2.4).

Architectural (n=2)

Two artifacts were classified as architectural: a staple from Test Pit 39 and a door latch with an eye screw from Test Pit 52.

Household (n=3)

Three of the recovered artifacts were considered to be of a household nature. This includes one clothes hook from the surface near the foundation, one crown cap from Test Pit 56 and one container lid from Test Pit 58.

Nuts and Bolts (n=12)

All of the specimens in the nuts and bolts assemblage were recovered from units around the foundation (Table 2.4). The assemblage consists of two eye screws, two galvanized screws, three regular screws, a quarter inch washer, a half inch bolt with nut, and a three-quarter inch bolt.

Wagon and Harness Parts (n=17)

This was largest of all the assemblages, numerically, but only two artifact types are represented. In Test Pit 55 a fragment of a single-tree clip from a wagon was recovered. The remainder of the assemblage is composed of "clips" or "latches" that are interpreted as being harness parts. Each part of the clip is cast iron and designed to be riveted in place. One piece forms a box which the other hooks over. When the two pieces are articulated a short tongue on the box fits through a slot on the hook and helps lock the two together. None of the pieces were articulated when recovered. All came from around the foundation (Table 2.4).

Wire Nails (n=16)

Sixteen wire nails were recovered. Table 2.5 provides penney weights

and distributions.

Square Nails (n=3)

Three fragments of common cut square nails were recovered. One each from Test Pit 46, 53, and 55.

Miscellaneous Tools (n=7)

This category is reserved for tools which cannot be assimilated into other classes. Included under this classification are two metal collars, one stainless steel clip, one cotter pin, one coil spring, one small length of copper cable, one copper cap, and one stainless steel screw valve. Distribution of these artifacts is provided in Table 2.4.

Miscellaneous Metal (n=15.5 g)

Fragments of metal which are unrecognizable as any type of tool or stock are classified as miscellaneous metal. Fifteen and a half grams of rusted iron were so classified at 14BU1008. Distribution of the material is shown in Table 2.4.

Plastic (n=1 plus numerous fragments)

This assemblage consists of one plastic lid from Test Pit 39 and numerous fragments of at least two small containers in Test Pit 40 and Test Pit 43. Markings on some of the fragments indicate that the containers held some type of automobile part produced by General Motors.

Rubber (n=1)

One small fragment of hard rubber weighing 1.0g was recovered from Test Pit 42.

Miscellaneous Personal (n=1)

This class is reserved for artifacts which are strongly associated with the personal context regardless of raw material type. The single constituent of this class is a glass marble with white and yellow swirls. It was recovered in T.P. 43.

DISCUSSION

Excavations at the Donaldson site during Phase IV did not contribute substantially to the knowledge of historical archaeology in the El Dorado Lake area. Attempts to locate two structures associated with the area's early period were unsuccessful. On the basis of the Phase IV investigation it is hypothesized that the deposits associated with the early period occupations were light and that subsequent development and agricultural activity have destroyed them.

The remnants of a limestone foundation northeast of the stone house were investigated. There is no evidence that the structure is of any great age. Based on the material that was recovered in and about the foundation it is postulated that the structure was a frame building built in the 20th Century and functioned as a workshop, possibly a small garage. The latch and general debris recovered from T.P. 52 suggests a door may have been present in the east wall. However, this interpretation has not been confirmed with any informants.

Table 2.1. Distribution of flat glass at 14BU1008.

COLOR	LOCATION				
	T.P. 37	T.P. 38	T.P. 41	T.P. 43	T.P. 47
Clear	1		2	1	
Green Tinted	1	1			1

Table 2.2. Distribution of bottle glass at 14BU1008.

TEST PITS	37	38	41	43	46	47	52	53	55	Surface
AMBER				1			1			2
AMETHYST		1								
AQUA				1				10		
CLEAR	1		2	1				1	4	10
GREEN TINT								2		1
MILK GLASS		2				2		1		2
RED									1	
TURQUOISE					3					

Table 2.3. Distribution of ceramic artifacts at 14BU1008.

TYPE	FUNCTIONAL TYPE	SURFACE	T.P. 37	T.P. 39	T.P. 42	T.P. 52	T.P. 53
EARTHERNWARE / IRONSTONE							
White Glaze	1 Plate, 2 cups	6(46.5g)			1(1.2g)		1(1.0g)
Copper Luster							
Tea Leaf							
Pattern	Coffee Cup					1(3.5g)	
INDUSTRIAL PORCELAIN							
Albany glaze/ Albany glaze	Electrical Insulator	1(84.0g)					
Brick Red glaze/ Brick Red glaze	Electrical Insulator	1(13.0g)					
White glaze/ White glaze	Electrical Insulator	1(36.0g)					
STONEWARE							
Bristol glaze/ Bristol glaze		1(11.0g)					
Albany glaze/ Gray Salt glaze			1(11.0g)				
BRICK							
Low Fire				2.5g			1.0g

Table 2.4. Distribution of metal artifacts at 14BU1008.

LOCATION	AGRICULTURAL	ARCHITECTURAL	HOUSEHOLD	MISCELLANEOUS TOOLS	NUTS AND BOLTS	WAGON AND HARNESS	MISCELLANEOUS METAL (Iron)
SURFACE			1	2		2	
T.P. 37				1			
T.P. 39		1		1			
T.P. 41							2.5g
T.P. 42						1	
T.P. 43				1	5		
T.P. 46					2		
T.P. 47					2		
T.P. 52	1	1		1	3	13	2g
T.P. 54							1.0g
T.P. 55	1					1	10g
T.P. 56			1				
T.P. 58			1	1			
T.P. 59				1			

Table 25. Distribution of wire nails at 14BU1008.

SIZE	T.P. 37	T.P. 42	T.P. 43	T.P. 46	T.P. 47	T.P. 59
Fragment				1		
3d					1	
5d					1	
6d			2		1	
8d				1		
12d	1					
16d						1
18d		2			1	
Galvanized Roofing Tack		2	1	1		

THE NEW CHELSEA SITE

The New Chelsea site, 14BU1007, occupies 80 acres along the Old Emporia Trail (Fig.2.6). This site represents the remains of the translocated town of Chelsea, Kansas. Previous investigations of the site included excavation of eight one by one meter test units during Phase II (Roberts 1981a) and extensive block excavations during Phase III. Phase IV investigations employed a controlled surface collecting and mapping procedure derived from the findings of the previous projects.

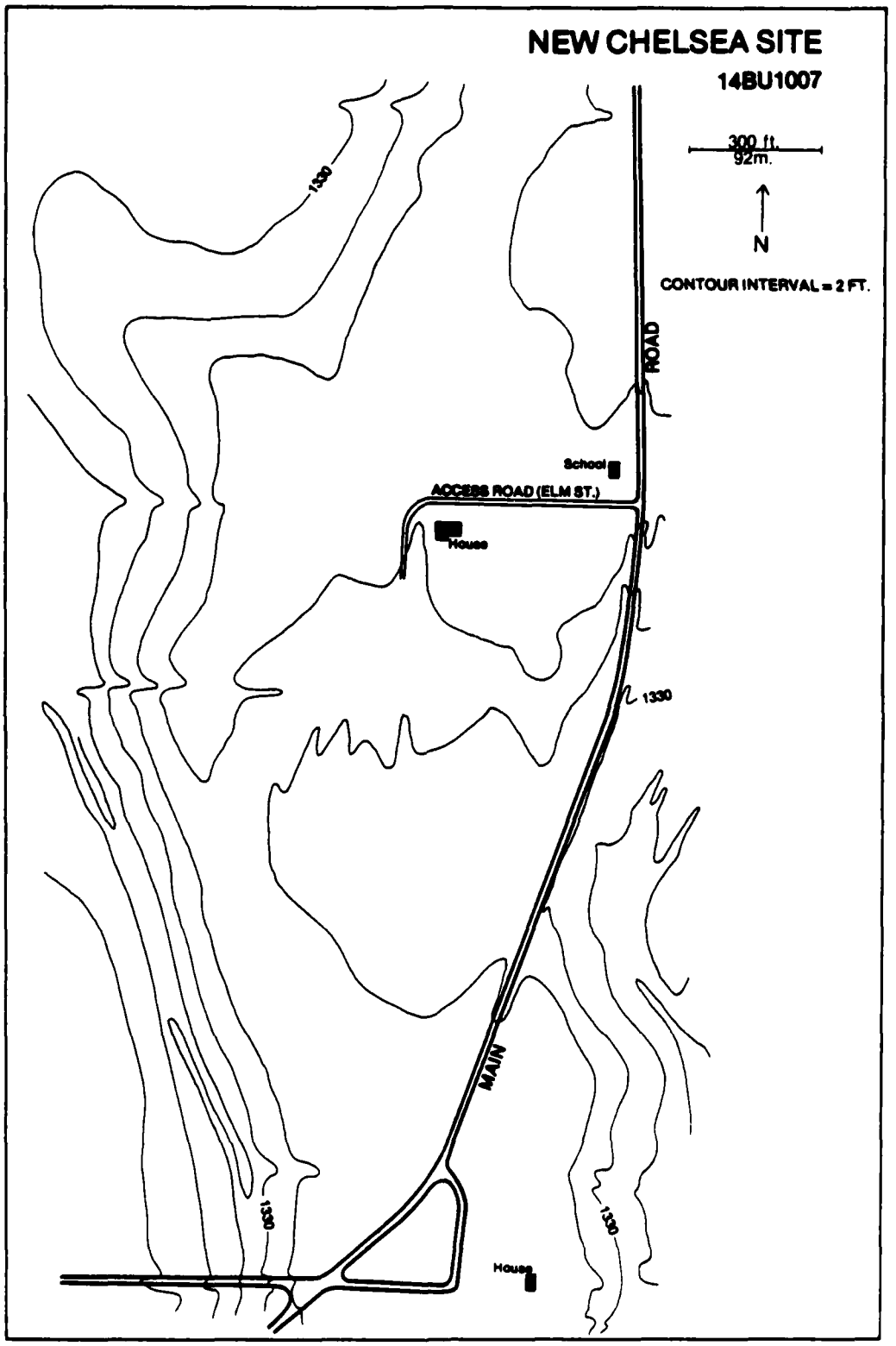
HISTORY

Chelsea was the name given the first county seat of Butler County by the individuals who founded the town. The Chelsea Town Company was incorporated February 11, 1858 by the Kansas Territorial Government (Kansas Private Laws 1858:323). Three hundred twenty acres of land between the Emporia Trail and Durechen Creek were acquired by the company and laid off into blocks, lots and squares. Unfortunately, no town plat of Chelsea has yet been located.

Chelsea and its supporters suffered through hard times during the first few years. Among the hardships which befell them were droughts, grasshopper infestations, and fires. These calamities were in addition to the necessary hardships of frontier living: ground breaking, clearing, building and contending with the fear of hostile Indian attacks. Through all of these misfortunes and difficulties, the Chelseaites endured. Chelsea may not have been expanding but it was at least remaining stable.

The 1860's dealt Chelsea several crushing blows. In 1860, Butler County's boundary lines were changed to include the town of El Dorado, a growing community that would soon challenge Chelsea's political position. This was followed in 1861 by the outbreak of the War Between the States. Thus at a time when

Figure 2.6. Contour map of the New Chelsea site.


NEW CHELSEA SITE
14BU1007
300 ft.
92m.
N
CONTOUR INTERVAL = 2 FT.
1330
ROAD
School
ACCESS ROAD (ELM ST.)
House
1330
MAIN
1330
1330
House

the community needed to concentrate its efforts on growth, the very members of the town necessary for expansion were siphoned off for the war effort.

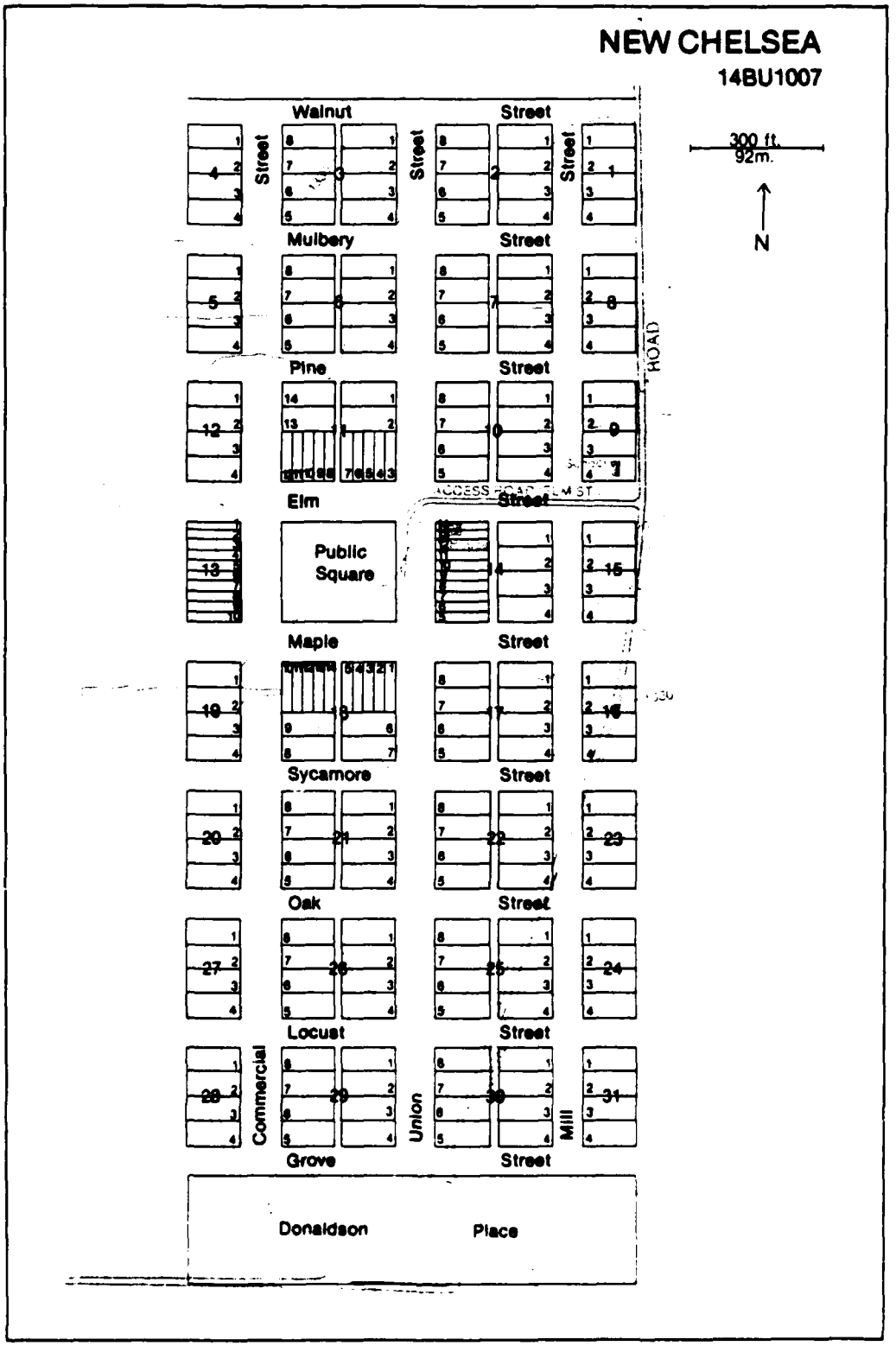
By 1864 El Dorado was able to win the county seat from Chelsea. Loss of political preeminence sounded the death knell for the town. Residents of the town began to sell-out. Some moved to El Dorado, others left the area completely. Chelsea as a town was essentially gone by 1867. However, the notion of a Chelsea community appears to have survived.

In 1868, the Chelsea post office was transferred from the original town site to George Donaldson's farm one mile south. That same year a plat for a new town called Chelsea (now designated 14BU1007) was recorded (Deed Book D). The new town was 145 rods and nine feet (2401.5 feet, 731.98m) north to south and 60 rods and eight feet (998 feet, 304.19m) east to west. It consisted of 31 blocks set aside for commercial or residential lots and one block for the public square (Fig.27). This design is termed a block square town pattern (Price 1968:30).

George Donaldson receives the credit for striving to maintain Chelsea as a viable town. He had the post office moved, platted the town on his own land, sold the initial town lots and formed the town company. His personal capabilities as a leader and organizer which had already led him to positions of authority and respect in the county, formed the foundation from which to build a new town. Chelsea, like an urban Phoenix, was to rise anew from its ashes. Fate, however, again interceded. Donaldson's untimely death in 1869 took away the preeminent power in promoting Chelsea. Although the town prospered for a few years, it never achieved the promise or potential that had been portended for it.

By 1878 Chelsea was again a failed town. Many residents had left and structures had been moved. In 1878, all but five blocks were vacated and the

Figure 2.7. Plot of Chelsea, Kansas superimposed on contour map of New Chelsea site.


NEW CHELSEA
14BU1007
300 ft.
92m.
N
Walnut Street
Mulbery Street
Pine Street
Elm Street
Maple Street
Sycamore Street
Oak Street
Locust Street
Grove Street
Commercial Street
Union Street
Mill Street
ACCESS ROAD ELM ST.
Public Square
Donaldson Place

land returned to the Donaldson family (Commissioners Journal 1878). A blacksmith shop operated by John Houser was the sole commercial enterprise at that time. In the closing years of the 19th Century, several stores were established on the town site. These establishments and the Chelsea school, which survived until 1954, helped maintain a notion or sense of community for the residents of the Chelsea area.

METHODOLOGY

Phase IV investigations at the New Chelsea site were designed to accomplish two goals: 1) recover physical data that could be used to reconstruct developments within the town; and 2) recover sufficient numbers of artifacts that could be identified as to time and place of manufacture so that economic patterns could later be highlighted. The methodology employed was a controlled surface collecting and mapping procedure.

During excavations at the New Chelsea site in 1979, particular attention had been given to examining the effect of agricultural disturbance on archaeological deposits (Roberts 1981a). Results of the investigation, indicated that deposits in the upper 10 cm of the plow-zone had suffered greater lateral displacement than those in the lower levels. Although surface deposits were less likely to be adequate for identifying activity areas or other configurations within a concentration of artifacts, the lateral displacement was not sufficiently great to preclude the use of concentrations of artifacts on the surface as indicators of where an occupation had occurred. Therefore, the Phase IV investigation centered about locating and mapping surface concentrations of historical artifacts.

The area of the site selected for investigation was that which was most readily accessible. Accessible in this instance refers to land already under cultivation. It was necessary to limit the investigation in this manner

because implementing the procedure required disking the surface. To disk outside the area already under cultivation would have required clearing obstacles and would have risked disturbing possibly intact deposits in other parts of the site.

The initial step of the field investigation was to have the project area disked. The field had been planted in wheat and required two diskings to obtain good visibility. Each disking cut the first four inches (approximately 10 cm) of soil. A light rain, the evening after the disking was completed, resulted in excellent collecting conditions.

Surveyors, placed at 10 m intervals, crossed the field in transects paralleling the main road. When an artifact was encountered, it was flagged with a wooden lath one meter tall. If an area contained an abundance of material, the perimeter of the concentration would be flagged. When all of the flags had been used, the concentrations and individual specimens were mapped on a site map, carefully collected, and then the flags removed and the survey continued. In this manner, the entire project area was surveyed, mapped and collected.

After the survey was completed, the material was taken back to the laboratory, cleaned and identified. The site map with the individually plotted artifacts and concentrations depicted on it was then carefully blended with a plat of Chelsea. By comparing artifact types and distributions with the town plat, interpretation of the archaeological evidence was facilitated.

ARTIFACTS

In the following section, artifacts will be typed and identified according to the criteria already put forth in the artifact section from the Donaldson site above. Individually plotted artifacts and constituent assemblages in concentrations will be treated separately.

INDIVIDUALLY PLOTTED ARTIFACTS

Two hundred and five individually plotted artifacts, representing all the major assemblages were recovered. Figure2.8 provides the distribution of these artifacts over the site. Due to the small scale of the map, it was necessary to group many of the specimens. These latent groupings are shown as light areas in Figure2.8 and are designated by a letter. Each of the individually plotted artifacts is identified in Table2.6 according to its grouping.

DISCUSSION

Many of the individually plotted artifacts could be considered of a household nature: flat glass, bottle glass and ceramics. The major exceptions are those specimens contained in Grouping F. These specimens include coal slag, metal bar and rod fragments, and tools; much the same variety of material recovered during the Phase III excavation of the blacksmith's shop (Roberts 1981b). In fact, these artifacts come from the area where the blacksmith shop was excavated and as can be seen in Figure2.8 are very close to lot 7 of block 18 where John Houser's blacksmith shop is believed to have stood.

Groupings A, B, C, and D contain many relatively modern pieces and are attributed to the long-time occupation of the house shown in Figure2.8. Grouping E contains a high percentage of flat glass which suggests a structure not necessarily a residence; land records support this conclusion by revealing that lots 13 and 14 of block 18, which are covered by E, were owned by Lakin and Watson who ran a dry goods store. Groupings G and H are predominantly ceramic and suggest a household. The lots covered by Groupings G and H were occupied by a half grocery/half house in the late 19th Century. Groupings J and I are also predominantly ceramic but their interpretation is linked to that of Concentration 3 below. The individual artifacts comprising Grouping K and the

Figure 2.8. Distribution of surface concentrations and individually plotted artifacts at the New Chelsea site.

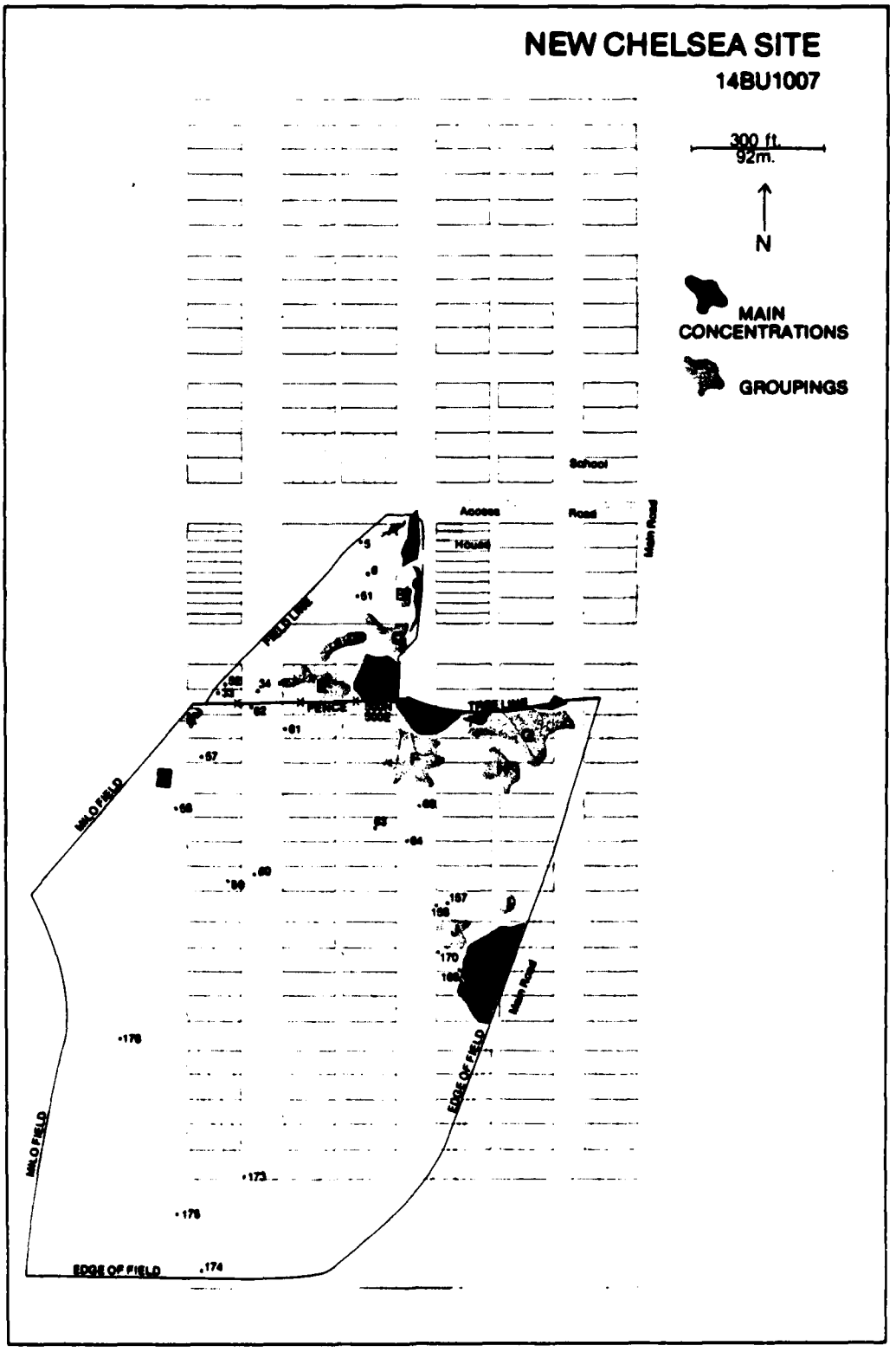

NEW CHELSEA SITE
14BU1007
300 ft.
92m.
N
MAIN CONCENTRATIONS
GROUPINGS
School
Access
Road
Main Road
House
PIERCE
EDGE OF FIELD
EDGE OF FIELD
EDGE OF FIELD
Main Road

Table 2.6. Individually plotted artifacts.

Grouping A
1. Unidentified
2. Green tinted bottle glass
3. Clear bottle glass
4. Milk glass lid liner

Group B.
7. 20d wire nail
8a Clear bottle glass
8b Amber bottle glass
9. Brick
10. Lime green bottle glass
11. Brick

Grouping C
12. Amber bottle glass
13. Clear bottle glass
14. Amber bottle glass
15. Green tinted flat glass
16. Amber bottle glass
17. Wire
18. Cobalt blue transfer printed ironstone plate fragment
19. -/white ironstone
20. Harness hook
21. White glazed ironstone
22. Mottled brown stoneware marble

Grouping D
23. Common cut square nail fragment
24. -/white ironstone
25. White glazed ironstone
26. White glazed ironstone
27. -/white ironstone
28. White/white semi-porcelain
29. Barbed wire

Grouping E
30. Blue transfer printed ironstone
31. Green tinted flat glass
32. -/white ironstone
35. Hex head bolt
36. White glazed ironstone
37. White glazed ironstone
38a Green tinted flat glass
38b Green tinted flat glass
38c Green tinted flat glass
39. Green tinted flat glass
40. Clear bottle glass
41. Green tinted bottle glass

Grouping E continued
42. Green tinted flat glass
43. White glazed ironstone cup fragment
44. Green tinted bottle glass
45a Green tinted flat glass
45b Green tinted flat glass
46a Support rod
46b Green tinted bottle glass
47. Amber bottle glass
48. -/white ironstone
49. Green tinted bottle glass
50. Clear bottle glass

Grouping F
66. Amber bottle glass
67. Coal slag
68. Hammer head
69. Modified horseshoe
70. Clear flat glass
71. Scale weight
72. Bar
73a Aqua bottle glass
73b Coal slag
74a Clear bottle glass
74b Coal slag
75. Amber bottle glass
76. Coal slag
77. Bar
78. Bar
79a Light Amethyst bottle glass
79b Coal slag
79c Wood chisel
80a Rod
80b Coal slag
81a Albany/yellow-brown stoneware
81b Coal slag
82. Chisel
83. Bar
84a Miscellaneous Metal
84b Wagon wheel hub
85a Coal slag
85b Bar
86. Double beveled shaft steel
87. Coal slag
88. Coal slag
89. Clear bottle glass
90. Wire nail fragment
91. Light amethyst bottle glass
92. Chisel

Table 2.6. Individually plotted artifacts (continued)

Grouping F continued
- 93. Aqua bottle glass
- 94. White glazed ironstone
- 95. Green tinted flat glass
- 96a. Chain link
- 96b. Bar
- 97. Albany/albany redware
- 98a. Green tinted bottle glass
- 98b. Miscellaneous metal
- 99. Albany/buff stoneware
- 100. Square nail fragment
- 101. Light amethyst bottle glass
- 102. White glazed ironstone

Grouping G
- 103. Medium brown/unglazed stoneware base
- 104. White glazed ironstone bowl fragment
- 105. Ornate cast iron
- 106. Milk glass lid liner
- 107. Brick red/Brick red stoneware
- 108. White glazed ironstone
- 109a. Albany/buff stoneware
- 109b. White glazed ironstone
- 110. White porcelain button
- 111. Green tinted bottle glass
- 112a. Clear bottle glass
- 112b. Amber bottle glass
- 113. White glazed ironstone
- 114. Milk glass lid liner
- 115. Clear bottle glass
- 116a. Green Insulator
- 116b. Amber bottle glass
- 117. Clear bottle glass
- 118. White glazed ironstone
- 119. Green tinted bottle glass
- 120. Albany/gray-green stoneware
- 121. -/white ironstone
- 122. White glazed ironstone
- 123a. White glazed ironstone
- 123b. Sheet iron
- 124a. Green tinted bottle glass
- 124b. Light amethyst bottle glass
- 125. White glazed ironstone
- 126. White glazed ironstone
- 127. Green tinted bottle glass
- 128. Amber bottle glass
- 129. Milk glass lid liner
- 143. White glazed ironstone
- 144. Brick red/Brick red stoneware bowl or crock (3 or 4 gallon)

Grouping G continued
- 145. Light amethyst bottle glass
- 146. Light olive green bottle glass
- 147. Center clip fragment
- 148a. Amber bottle glass
- 148b. Light amethyst bottle glass
- 149. White glazed ironstone

Grouping H
- 130. Clear bottle glass
- 131. White/white porcelain
- 132. Amber bottle glass
- 133a. Brick red/brick red stoneware bowl
- 133b. Albany/albany stoneware
- 134a. White glazed ironstone
- 134b. White glazed ironstone
- 135a. Light amethyst bottle glass
- 135b. Green tinted bottle glass
- 136. Aqua bottle glass
- 137. White glazed ironstone
- 138a. Green tinted bottle glass
- 138b. Green tinted bottle glass
- 139. Green tinted bottle glass
- 140. Green tinted bottle glass
- 141. Albany/Albany stoneware
- 142. Milk glass lid liner
- 150. Milk glass lid liner
- 151. Green tinted bottle glass
- 152a. White glazed ironstone sugar bowl fragment
- 152b. Brown transfer printed ironston

Grouping I
- 153. Unglazed/gray green stoneware
- 154. White glazed ironstone bowl fragment
- 155. Medium brown/beige salt glaze stoneware
- 156. White/white semi-porcelain

Grouping J
- 159. Green tinted flat glass
- 160. Light amethyst bottle glass
- 161. White glazed ironstone cup fragment
- 162. White glazed ironstone
- 163. Clear bottle glass
- 164a. White glazed ironstone coffee cup handle

Table 2.6. Individually plotted artifacts (continued)

Grouping J continued	
164b.	Green tinted flat glass
165.	-/white ironstone
166.	Green tinted flat glass
167a.	Albany/gray salt glaze stoneware
167b.	Albany/beige salt glaze stoneware
168.	Black /beige salt glaze stoneware crock
171.	Wagon "Fifth wheel"
172.	White glazed ironstone plate fragment
Grouping K	
53.	Milk glass bottle
54a.	White glazed ironstone
54b.	Clear bottle glass
55.	Clear bottle glass
56.	White glazed ironstone
Others	
5.	Barbed wire
6.	Aqua bottle glass
33.	Pan fragment
34.	-/white ironstone
51.	Bristol/Bristol stoneware
52.	Green bottle glass
57.	Stove part
58.	Buckle
59.	White glazed ironstone
60.	White glazed ironstone
61.	Cobalt blue/white ironstone plate fragment
62.	White glazed ironstone handle
63.	Harness ring
64.	Light amethyst bottle glass
65.	Albany/Albany red ware
157.	-/white ironstone
158.	Green tinted flat glass
169.	Green tinted bottle glass
170.	Green tinted bottle glass
173.	Miscellaneous metal
174.	Green tinted bottle glass
175.	White porcelain button
176.	White/white semi-porcelain

others close by suggest another household assemblage. However, no land records affecting this area have yet been uncovered. The small assemblage may indicate a brief occupation.

CONCENTRATION 1

Concentration 1 was an extensive collection of glass and ceramics from along the treeline in the northern end of the south field.

Flat Glass (n=13)

The flat glass assemblage is composed entirely of green tinted specimens. Thicknesses in the ranges of 1.6-1.7 mm and 2.0-2.2 mm are the most common. The distribution of thicknesses is provided in Table 2.7.

Bottle Glass (n=80)

A breakdown of the bottle glass assemblage by color is provided in Table 2.7. This assemblage contains 11 bottle neck fragments, five of which have identifiable finishes: one double beaded (aqua), one patent/extract (light amethyst), one screw (yellow-green) and two beer (one amber, one green tint). Only the amber beer bottle neck is complete enough to date. A seam which runs two-thirds the length of the neck indicates a ca. 1860-1880 manufacture date.

Other notable specimens include a wine bottle's round base with a kickup, a lamp globe base, a piece of light amethyst pressed glass with a star-burst pattern (possibly a sugar bowl), a fragment of milk glass with a star-burst pattern, two green insulator fragments, a milk glass jar lid liner, and a fragment of a unique cobalt blue panel bottle embossed with an "O", "C", or "G".

Ceramics (n=37)

Paste/Glaze and functional types for ceramics recovered from Concentration 1 are presented in Table 2.8. Most of the assemblage is plain white-glazed ironstone. One of the specimens bears the common 19th Century "Corn n'Oats" embossing (Wetherbee 1974:74).

Table 2.7. Glass assemblages from concentration 1.

Bottle Glass	
Amber	21
Aqua	5
Clear	14
Cobalt Blue	1
Green tinted	20
Light Amethyst	14
Milk	3
Sea Green	1
Yellow Green	1
Flat Glass - Green tinted	
Thickness	
1.6	3
1.7	1
2.0	3
2.2	2
2.4	1
3.1	1
3.2	1
3.4	1

Discussion

Concentration 1 can be characterized as a household assemblage. Probably only a single household is represented. This concentration is most likely related to the occupation that produced Groupings G and H, above.

CONCENTRATION 2

Concentration 2 was the smallest of all the concentrations collected. As can be seen in Figure28, it occurs outside the platted boundaries of the town.

Bottle Glass (n=1)

One green-tinted bottle fragment was recovered.

Ceramics (n=4)

Three of the specimens (26.0g) are white-glazed ironstone. The remaining specimen is a white glazed semi-porcelain plate fragment. One of the ironstone specimens is also a plate fragment.

Nuts and Bolts (n=1)

One bolt fragment with a 1¼ inch nut was recovered.

Discussion

This was the westernmost of the concentrations. Concentration 2 may represent further evidence for a brief occupation in block 19.

CONCENTRATION 3

Concentration 3 was the largest of all the concentrations collected. It occurred as a very distinct, isolated assemblage on the eastern edge of the field.

Flat Glass (n=168)

All the flat glass in Concentration 3 is green tinted. The distribution of thicknesses is provided in Table29. Three ranges account for most of the specimens: 1.5-1.7 mm, 2.0-2.3 mm, and 2.5-2.7 mm.

Table 2.8. Ceramic assemblage from concentration 1.

Paste/Glaze Type	Count (Weight)	Functional Types
EARTHENWARE/IRONSTONE		
Brown Transfer Printed ware	1 (2.0g)	
Corn 'n Oats Pattern	1 (2.5g)	1 Plate
White glaze	22 (50.9g)	1 Butter dish
SEMI-PORCELAIN		
Orange overglaze painted	1 (0.5g)	
White glaze	5 (14.0g)	1 Coffee cup 1 Coffee pot handle
STONEWARE		
Albany glaze/Albany glaze	1 (2.5g)	
Albany glaze/Bristol glaze	1 (5.5g)	
Albany glaze/Gray/Green glaze	1 (9.0g)	
Albany glaze/Yellow/Brown glaze	1 (1.5g)	
Brick Red glaze/Brick Red glaze	1 (45.0g)	
Medium Brown glaze/ Buff glaze	1 (9.4g)	
Medium Brown glaze/ Light Gray glaze	1 (27.5g)	
BRICK		
High Fire	(57.0g)	
Low Fire	(11.0g)	

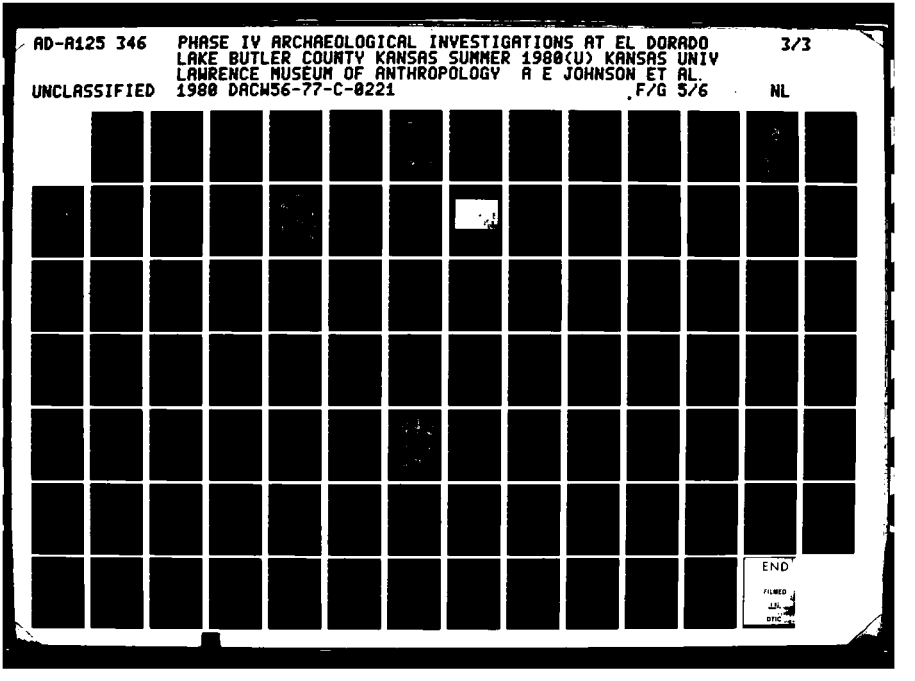
Table 2.9. Glass assemblages from concentration 3.

BOTTLE GLASS		FLAT GLASS	
		Thickness	
Amber	54	1.0	1
Aqua	65	1.3	4
Black	1	1.5	22
Clear	178	1.7	40
Dark Amethyst	3	2.0	20
Emerald Green	5	2.1	21
Green Tinted	166	2.2	15
Light Amethyst	126	2.3	14
Milk	18	2.5	17
Olive Green	1	2.7	9
Sea Green	3	3.1	5
Yellow Green	3		

Bottle Glass (n=623)

The color distribution of bottle glass sherds is provided in Table29. Thirty-one of these specimens are neck fragments, 25 of which have identifiable finishes: one beaded (light amethyst), one double beaded (green-tinted), one collared (green-tinted), one flavied (clear), two crown cap (aqua), four screw (3 aqua, 1 green-tinted), five beer (4 amber, 1 light amethyst), and ten medicine/extract (1 amber, 1 aqua, 2 light amethyst, and 6 clear). Seven of the necks provide chronological information based on seam height: three have seams extending two-thirds of the way up the neck which indicates a ca. 1860-1880 manufacture date; three have seams all the way to the rim, indicating ca. 1880-1900; and one has no seam at all, indicating pre-1860.

Other specimens also provide chronological data. One square (28 x 28 mm) base with bevelled corners bears, "B B Co." (Fig. 2.9a). This was the mark of the Berney-Bond Glass Co. of Pennsylvania, ca. 1900 (Toulouse 1971:70). One round base (Fig. 2.9b) bears a double-stamped double circle mark which was used by the Buckeye Glass Co. of Ohio from 1880-1900 (Toulouse 1971:391-2). A fragment of a milk glass lid liner carries the "Tudor Rose" design (Fig.2.9c) used in Mason jar zinc caps from 1885-1900 (Toulouse 1971:344). One fragment is embossed BEGG - in a style that denotes the C. W. Beggs and Sons Co. of Chicago. Advertisements for Begg's nostrums have been recorded from 1886-1897 (Baldwin 1973) but Cramp (1921:582-3) reported the company was still being prosecuted for making false and fraudulent claims about its products in 1916. A panel bottle fragment has the embossing, "McLea-" which matches a W. J. McLean's Fincture of Life bottle illustrated in Baldwin (1973:335). No dates were recorded but it is probably late 19th Century. A round base bears the partial embossing, "T. A. SNI-". The T. A. Snider Preserve Co. operated in Cincinnati, Ohio from 1884-? and in Chicago from an unknown date to 1923 (Toulouse 1971:449-50). This mark does not match any illustrated in Toulouse.


AD-A125 346
PHASE IV ARCHAEOLOGICAL INVESTIGATIONS AT EL DORADO LAKE BUTLER COUNTY KANSAS SUMMER 1980(U) KANSAS UNIV LAWRENCE MUSEUM OF ANTHROPOLOGY A E JOHNSON ET AL.
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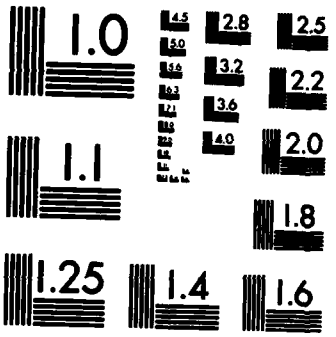
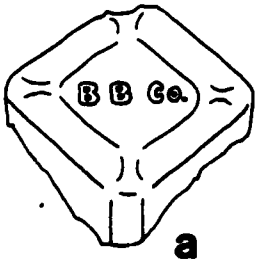
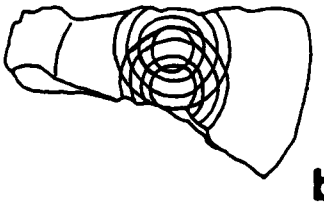


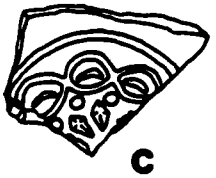
Figure 2.9. Glass artifacts: (a-b) bottle bases; (c) lid liner; (d) glass bottle stopper; (e-g) panel bottle fragments. Concentration 3: a-f; Concentration 8:g.



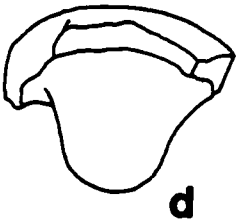
a



b



c



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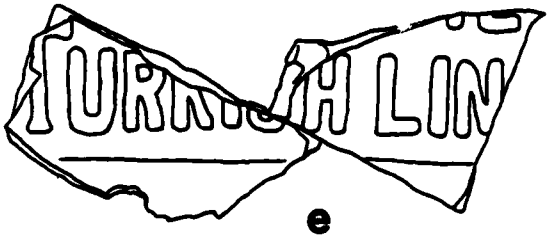

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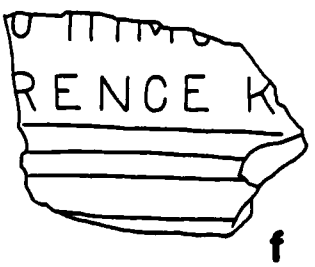

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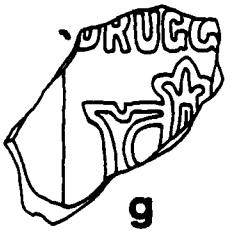


g

5cm

however, his earliest only dates to 1900. This mark may be an earlier one. A basal fragment of unknown shape carries a reversed "3" as a mark. The same mark was observed on a French square bottle at Ft. Bowie (Herskovitz 1978:25). Ft. Bowie dates 1862-1894.

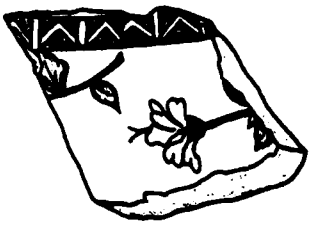
Other notable bottle glass specimens include three fragments of a light amethyst "log cabin" bottle(s); three fragments of light amethyst stemware (diamond point pattern); three tumblers (one round with a sunburst pattern, two faceted); a clear glass handle; a plain rim from a container (possibly a sugar bowl); a pressed glass lid fragment; an olive green bottle stopper (Fig.29d); a clear, pressed glass fragment with leaves, beads, and stars on a textured background; base of a lampglobe; an insulator fragment; a green tinted specimen with the embossing -SAP- (sarsaparilla?); a round amber base estimated at 3 inches in diameter with a Maltese cross embossed toward the perimeter of the pontil mark; a round, aqua base with -OV- on the periphery and 87 in the center; a green tinted fragment with "93"; an amber medicine bottle sherd with -UA- and graduated dosage lines embossed upon it; four milk glass lid liners; two green tinted panel bottle fragments that articulate to read TURKISH LIN- (linament?) (Fig.29e); and two aqua panel bottle fragments which do not articulate but share identical lettering styles, colors, and thicknesses, and when properly oriented read, "Dr --/LA-RENCE K---" (Lawrence, Kansas?) (Fig 2.9f).

Ceramics (n=485)

The large ceramic assemblage from Concentration 3 is identified according to paste/glaze and functional types in Table 2.10.

Several of the pieces provide chronological data. A Johnson Brothers' maker's mark (Fig 2.10e) on an ironstone plate identifies the specimen as having been produced in England between 1891-1913 (Godden 1964:355). Two other pieces

Figure 2.10. New Chelsea site ceramic artifacts: (a) possible Staffordshire ware, deep purplish-blue transfer printed; (b) ironstone decalware; (c) white-glazed porcelain doll-head; (d) Alfred Meakin's Copper Lustre Tea Leaf pattern sherd with complete design added; (e) Johnson Brothers mark from an ironstone plate sherd. Concentration 3:d-e; concentration 5:a; concentration 7:b-c.



a

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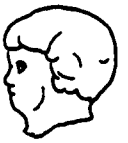

c

d

e

5cm

Table 2.10. Ceramic assemblage from concentration 3.

Paste/Glaze	Count (Weight)	Functional Types
EARTHENWARE/IRONSTONE		
Copper lustre tea leaf pattern	1 (1.2g)	1 Coffee cup
Decalware	3 (7.2g)	1 Cup
Dull pink glaze	1 (0.3g)	
White glaze	230 (808.6g)	
White glaze with cobalt blue design	1 (4.8g)	
PORCELAIN		
White glaze	8 (8.7g)	2 Buttons 2 Soap dishes 1 Doll leg
SEMI-PORCELAIN		
White glaze	40 (186.4g)	
STONEWARE		
Albany glaze/Albany glaze	85 (70719g)	1-1 gallon crock 2-2 gallon crocks 1- 3 or 4 gallon crock 1- 5 or 6 gallon crock
Albany glaze/Black glaze	1 (20.0g)	
Albany glaze/Beige Salt glaze	3 (58.5g)	
Albany glaze/ Blue and White Salt glaze	1 (10.0g)	
Albany glaze/ Brown Salt glaze	1 (21.0g)	
Albany glaze/Buff glaze	4 (61.5g)	
Albany glaze/ Buff Salt glaze	9 (154.2g)	1 indeterminant size crock

Table 2.10. Ceramic assemblage from concentration 3 (continued)

Paste/Glaze	Count (Weight)	Functional Types
Albany glaze/Gray glaze	1 (12.0g)	
Albany glaze/Gray Salt glaze	10 (127.1g)	1 indeterminant size crock
Albany glaze/Gray-Green glaze	4 (135.0g)	1- 2 gallon crock
Albany glaze/Light Green Salt glaze	7 (239.7g)	1- 5 or 6 gallon crock
Albany Glaze/Medium Brown glaze	4 (54.5g)	1 indeterminant size crock
Albany glaze/Tan glaze	11 (169.0)	1 indeterminant size crock
		1-3 or 4 gallon crock
Albany glaze/Yellow glaze	2 (50.5g)	1- 3 gallon crock
Albany glaze/Yellow-Brown glaze	14 (287.0g)	2- 3 or 4 gallon crocks
		2- indeterminant size crocks
Beige/Unglazed	6 (24.5g)	5 tiles
Black glaze/Black glaze	3 (19.5g)	
Black glaze/Gray-Green glaze	1 (41.5g)	
Brick Red glaze/Brick Red glaze	5 (37.0g)	
Bristol glaze/Bristol glaze	7 (104.3g)	1 bowl
Brown glaze/Yellow, Blue, and White Banded Brown glaze	2 (5.7g)	2 refrigerator bowls
Medium Brown glaze/Beige Salt glaze	1 (6.0g)	
Medium Brown glaze/Buff Salt glaze	2 (187.0g)	1 crock

Table 2.10. Ceramic assemblage from concentration 3 (continued)

Paste/Glaze	Count (Weight)	Functional Types
Medium Brown glaze/ Gray Salt glaze	1 (12.0g)	1 bowl
Medium Brown glaze/ Medium Brown glaze	4 (23.5g)	
Olive Green glaze/ Brown Salt glaze	1 (12.0g)	
Sky Blue glaze/ Sky Blue glaze	1 (1.3g)	1 cup
Transparent Slip/ Olive Green glaze	2 (51.0g)	
Unglazed/Olive Green glaze	3 (55.5g)	
CLAY		
Gray (unglazed)	1 (5.0g)	1 pipe
BRICK		
Low Fired	8.0g	

bear fragments of makers marks consisting of the Royal Coat of Arms but they are insufficient to date or identify. Another piece carries the words "Royal Ironstone" which means it must date after 1850 when "Royal" was first added to names. A stoneware crock sherd has an applied ceramic handle. Such handles were replaced around 1915 by metal bales (Viel 1977:15).

Decorations include an embossed wheat design below the rim of a cup and saucer of white glazed ironstone. Alfred Meakin's copper lustre tea leaf pattern is present on one cup sherd (Fig. 2.10d). Decalware is represented by a floral motif in beige and pink (Fig. 2.10b).

Agricultural (n=5)

This assemblage consists of a plowshare fragment, two mower blades, and two pieces of round. None of the pieces in this assemblage, necessarily had anything to do with the historic occupation of this spot. All could be intrusive.

Architectural (n=13)

Architectural or building related artifacts include two hinges, two strap hinges with rivets, two latches, one lock plate, on boat spike, four 1¼ in. staples and one 1½ in. staple.

Arms (n=1)

This category consists of a single copper cartridge case.

Blacksmith (n=24)

The blacksmith related assemblage consists of six pieces of iron bar, six pieces of banding, four pieces of rod, one horseshoe, three horseshoe fragments, one riveter (Fig.211), one rivet, one screwdriver fragment, one sheet iron fragment, and a small amount of miscellaneous iron.

Household (n=12)

This assemblage consists of a drawer pull and 11 cast iron artifacts, classified as stove parts including two stove legs (Fig. 2.12a & b).

Figure 2.11. Riveter, Concentration 3.

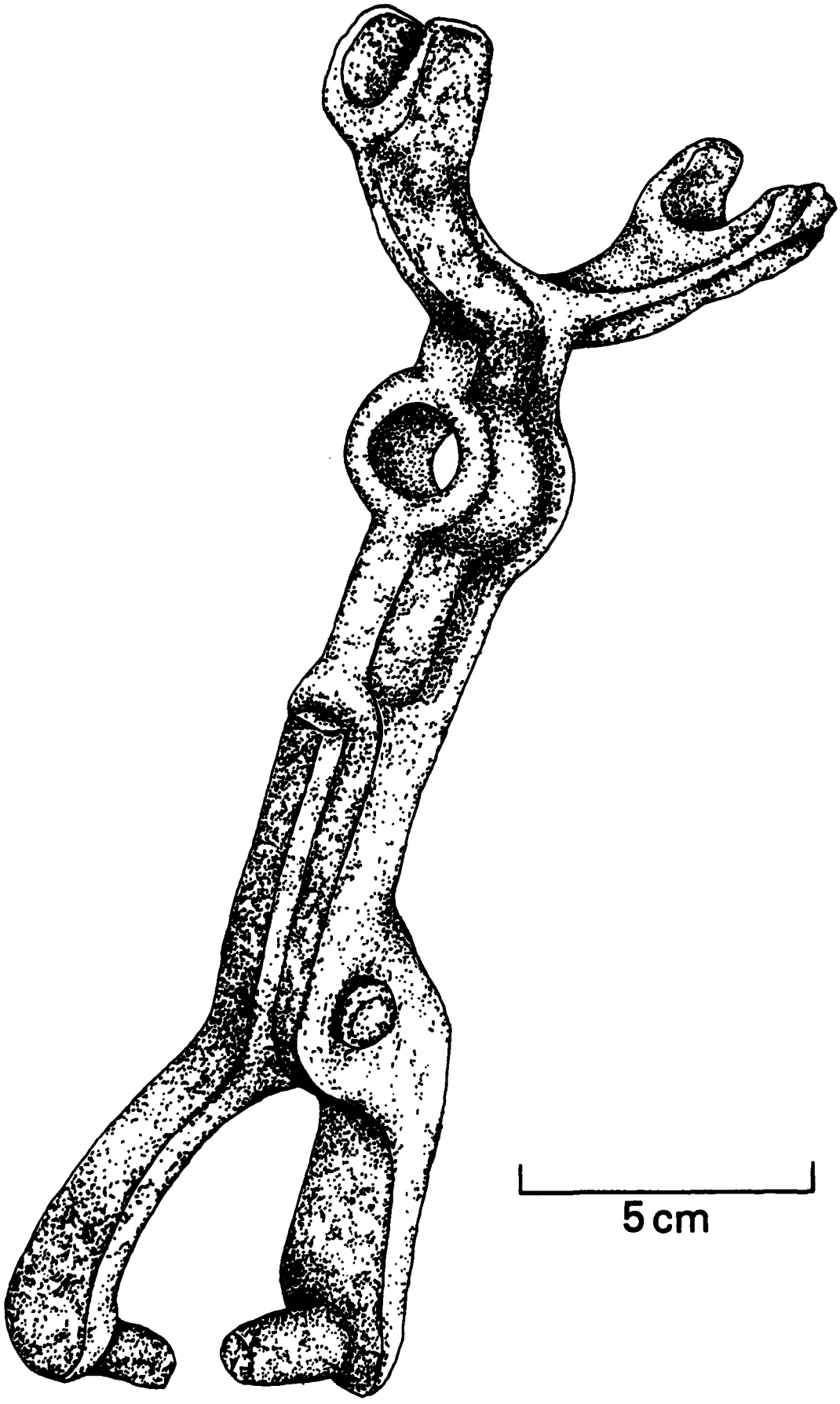
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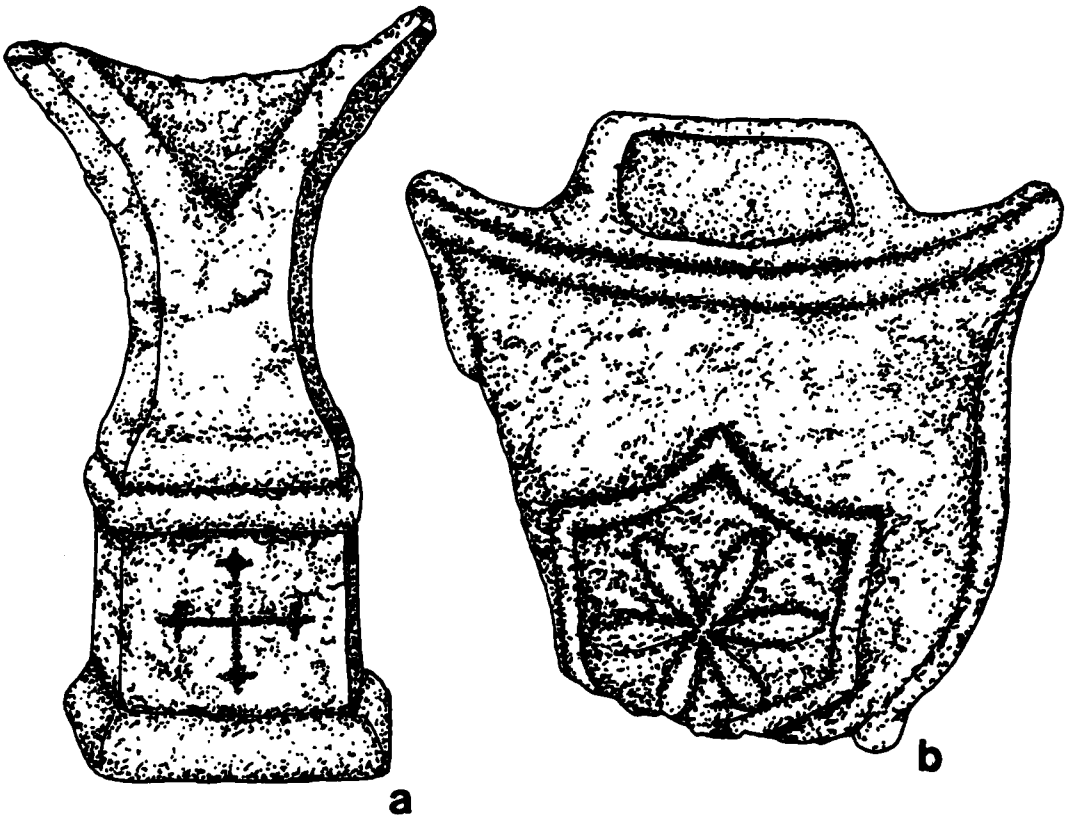
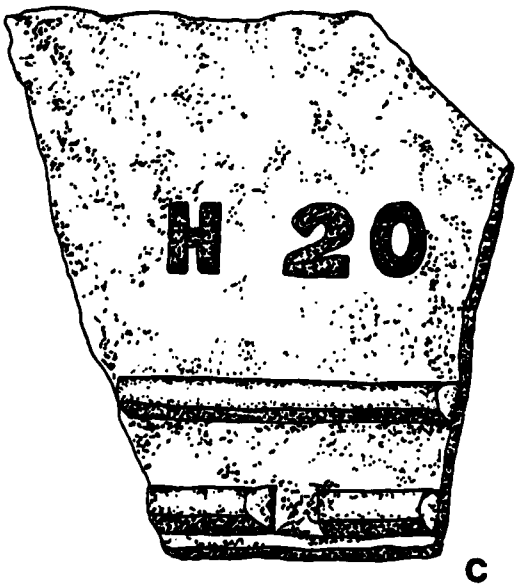
Figure 2.12. Stove parts, Concentration 3:
(a-b) stove legs; (c) body fragment.





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Miscellaneous Tools (n=6)

Miscellaneous tools include a 9 in. wrench, a vertical sprocket, a sprocket seat, a socket head, a file, and a file fragment.

Nails (n=47)

The pennyweight distribution of square and wire nails is provided in Table 2.11.

Nuts and Bolts (n=6)

Members of the nuts and bolts assemblage include two bolt fragments, one carriage bolt, one 6½ in. bolt, and two 3/8 in. nuts.

Personal (n=3)

This assemblage includes a clothes buckle, a suspender buckle (Fig. 2.13b), and a pocket knife (Fig. 2.13c).

Wagon and Harness Parts (n=12)

Wagon and harness parts recovered include one harness buckle, one wagon hook, one brow iron, one whiffle tree bolt head (Fig. 2.13d), one whiffle tree spring, one wheel hub, one hub rim, one clip, one wagon rod, one wagon handle, and two pieces of wagon strap bar.

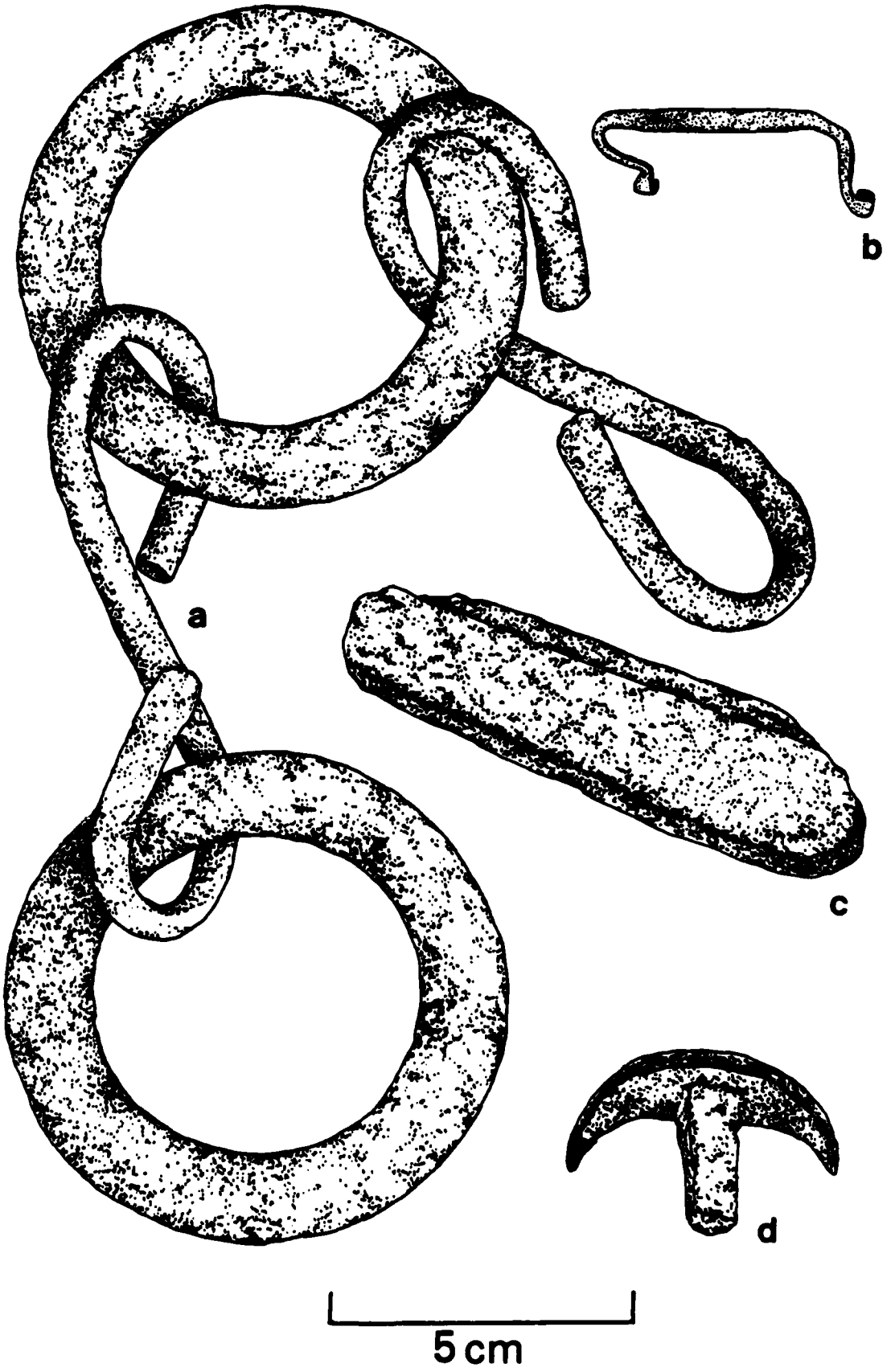
Discussion

Concentration 3 is the largest and most complex of the surface assemblages. Many of the artifacts are of a household nature, but a sizeable number are more commercial or industrial affiliated. Attributing Concentration 3 to a household is not sufficient. Nor does an interpretation of the area as a dumpsite withstand scrutiny: during the days when the town existed, locating a dump along its main thoroughfare would not have been a wise civic move. Once the town was defunct, there was no reason for a farmer to despoil a portion of a good field with an accumulation of historic debris. It is unlikely that this is fill transported from elsewhere to fill in a low-spot as the town was located on the floodplain and depressions have not been encountered there in other parts

Table 2.11. Concentration 3 nail sizes.

SQUARE		WIRE	
Penny Weight	Count	Penny Weight	Count
Fragments	10	Fragments	6
2d	1	6d	1
3d	3	8d	3
4d	2	10d	1
6d	1	12d	4
7d	1	20d	2
8d	7		
10d	2		
16d	1		
20d	1		
No. 12 Tack	1		

Figure 2.13. Metal artifacts: (a) harness rings; (b) brass suspender buckle; (c) pocketknife; (d) whiffletree bolt head. Concentration 3: b-d; Concentration 4:a.


a
b
c
d
5 cm

of the project area. In addition, infrared photographs of the area taken in 1980 do not show any evidence of soil disturbance in the vicinity of Concentration 3.

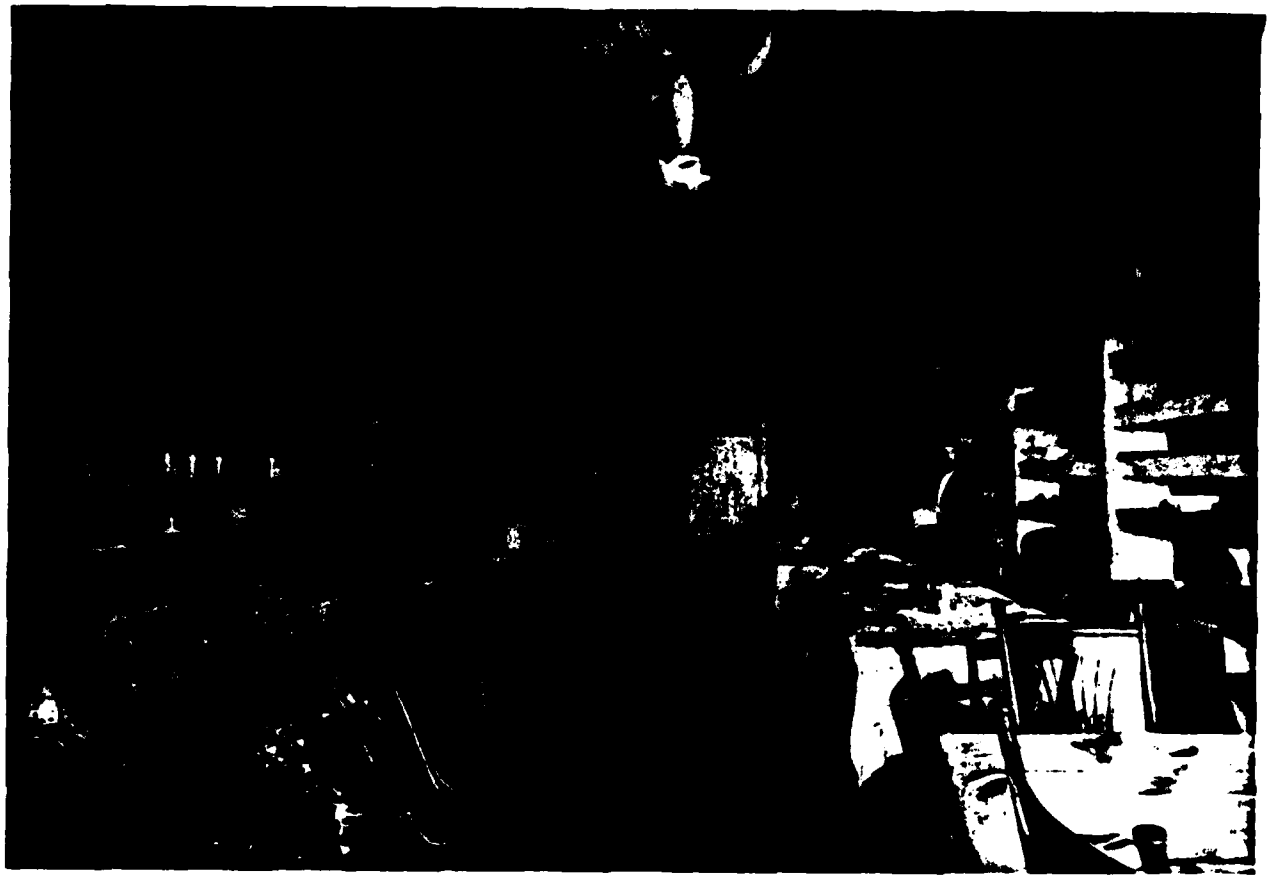
None of the interpretations above adequately account for the Concentration 3 assemblage. Written records do not contribute any information to directly resolve the problem either. No land records for block 25, which is where Concentration 3 occurs, have been uncovered with the exception of the fact it was owned for a time by Mr. Lee, the millowner. However, this is not a mill assemblage.

The clue to the potential interpretation of the assemblage came from informants. During the Phase II and Phase III oral history interviews, a number of the informants made reference to a "Chelsea store" which was operating in the early 20th Century. There was some conflict as to the exact location of the store but most, including Madge Jones, Olin Stansbury, F. W. Holderman, and Wayne Manka, who were among the oldest interviewers, placed the store in the field across the road from, but near the Donaldson stone house. This approximates the location of Concentration 3. The references to the Chelsea store in Mooney (1916) also agree with this general location.

A bonus to the interpretation came from Mr. Manka who produced a water damaged photograph inscribed "Old Man Bashaw's store" (Fig.2.14). Bashaw is the name most commonly associated with Chelsea store. The photo depicts the interior of a store which also functioned as a restaurant and luncheon counter. The complex of activities represented by a general store/restaurant/residence could produce an assemblage such as Concentration 3.

Using the datable specimens from the assemblage, the store appears to have operated in the period from the 1880's to after the turn of the century. None of the informants could venture a starting date but usually cited 1915-16

Figure 2.14. Interior of "Old Man Bashaw's store", early 20th century. Photograph courtesy of the Kansas Collection, Kenneth Spencer Research Library, University of Kansas.



as a terminus for the store. On the basis of these data the "Chelsea store" does not appear to have actually been a part of the town of Chelsea. However, it was definitely a central focus of the Chelsea community.

CONCENTRATION 4

Concentration 4 occurred north of the wire fence, near the datum stake (Fig.2.8). It covered portions of lots 1-4 block 18.

Flat Glass (n=8)

The flat glass assemblage consists of green tinted glass in three thicknesses: 1.3 mm (one specimen), 1.5 mm (2), and 2.0 mm (5).

Bottle Glass (n=38)

Comprising the bottle glass assemblage are three amber fragments, five aqua, 13 clear, 11 green tinted, five light amethyst, and one milk. Only one neck is included, a flair finish, clear specimen with an estimated one inch orifice diameter; possibly an ink bottle. Other notable specimens include the rim of a drinking glass; a stemware base with a star-burst pattern; a clear glass, single-finger handle; melted green tinted glass, and a green tinted basal fragment with an apparent hard suction cut-off scar. Such scars are left by a bottle making machine which was developed in 1904 (Toulouse 1969:582).

Ceramics (n=35)

Table 2.12 privides the paste/glaze and functional types that comprise the ceramic assemblage.

Harness Parts (n=1)

The only element in this class is a set of heavy-duty, three inch harness rings (Fig. 2.13a).

Square Nails (n=3)

Three square nails, 6d, 7d, and 9d were recovered.

Table 2.12. Ceramic assemblage from concentration 4.

Paste/Glaze Type	Count (Weight)	Functional Type
EARTHENWARE/IRONSTONE		
White glaze	25 (37.1g)	1 cup
SEMI-PORCELAIN		
White glaze	8 (26.5g)	
STONEWARE		
Albany glaze/Bristol glaze	1 (11.2g)	1 Advertising Jar
Unglazed/ Yellow/Brown glaze	1 (10.5g)	1 ink or ale bottle
BRICK		
Low Fire	(10.0g)	

Woodworking (n=3)

The woodworking assemblage consists of a nail punch, a two inch wood-screw, and a fragment of a carpenters bit.

Discussion

This concentration occurs in the business or commercial section of the town. It is not surprising, therefore, that the assemblage differs from those characterized as domestic. The two containers identified as possible ink bottles would be items common in any business establishment (hopefully filled with profit-black ink). However, the most significant artifacts may be the small woodworking assemblage because lots 1 and 2 were owned by a carpenter named Wilcox, ca. 1870. The archaeological assemblage thus provides a direct link with the historical record. Of the remaining two lots, 3 may have been the site of a doctor's office, but the records are unclear and none of the recovered artifacts are classified as medical.

CONCENTRATION 5

Concentration 5 occurred at the very northern extremity of the Phase IV project area. It is opposite the Holderman House (H-78-8, see Roberts and Wilk 1981), a residence that was occupied for approximately 100 years.

Flat Glass (n=4)

Four fragments of green tinted flat glass were recovered. Each was a different thickness: 1.4, 1.7, 2.5, and 2.7 mm.

Bottle Glass (n=29)

The bottle glass assemblage is composed of one fragment of amber, eight of clear, one of cobalt blue, nine of green tint, one of emerald green, seven of light amethyst, one of lime green and one of milk. Two specimens (one amber and one light amethyst) are the bases of flasks; three are insulator fragments; two are Coca Cola bottle fragments, and one light amethyst specimen has a partial label: -LIN- (Liniment?).

Table 2.13. Ceramic assemblage from concentration 5.

Paste/Glaze Type	Count (Weight)	Functional Type
EARTHENWARE/IRONSTONE		
White glaze	2 (3.0g)	
EARTHENWARE/IRONSTONE		
Blue Transfer Printed ware	1 (6.2g)	1 Plate
STONEWARE		
Albany glaze/ Yellow Brown glaze	1 (17.5)	
Medium Brown glaze/ Brown Salt glaze	1 (13.0g)	
BRICK		
High Fire	(249.3g)	
Low Fire	(7.0g)	

Ceramics (n=5)

The small ceramic assemblage is presented in Table 2.13. Only one specimen is notable, a dark purple-blue transfer printed ironstone plate sherd (Fig.210a). The sherd is classified a Staffordshire ware and the design is similar to that produced by Alfred Fenton and Sons (1887-1901) (Anderson 1981: 130).

Agricultural (n=1)

The assemblage consists of a single piece of twisted round wire.

Architectural (n=2)

One hinge element and a one inch staple comprise the architectural assemblage.

Household (n=1)

The single specimen in this assemblage is a relatively recent tin can.

Nuts and Bolts (n=2)

An 11½ in. T-Bolt with a one inch hexagonal nut and 6½ in. oval-head bolt with a 3/4 in. nut comprise this assemblage.

Discussion

The few pieces in this assemblage that suggest any age beyond the recent past are probably associated with the long-term occupation of the Holderman house.

CONCENTRATION 6

Concentration 6 was located south of Concentration 5. This concentration extended into the tall grass and weeds on the east, that marked the boundary of the field (Fig.2.8).

Bottle Glass (n=11)

The bottle glass assemblage consists of four fragments of amber, four of clear, two of green tinted, and one of light amethyst.

Ceramics (n=8)

Concentration 6's ceramic assemblage is presented in Table 2.14.

Blacksmithing (n=1)

One piece of banding was recovered.

Mechanical (n=1)

A pressure gauge from an unknown type of machine was collected.

Discussion

Concentration 6 was singularly uninspiring. Except for a small gap, Concentrations 5 and 6 could have formed one long distribution probably related to the Holderman house occupation.

CONCENTRATION 7

Concentration 7 covered a small area in the northeast corner of the field. The material extended into the treeline along the northern border (Fig. 2.8).

Flat Glass (n=12)

Twelve pieces of green tinted flat glass were recovered. Five different thicknesses are represented: 1.8 (1), 2.1 (4), 2.5 (3), 2.8 (3), and 3.0 mm (1).

Bottle Glass (n=17)

Two fragments of amber, two of aqua, two of clear, one of dark amethyst, five of green tinted, four of light amber and two of milk comprise the bottle glass assemblage. A green tinted bottle neck, broken at the rim, has a seam that goes up two-thirds the length of the neck indicating a ca. 1860-1880 manufacturing date. An amber crown cap bottle neck has a seam all the way to the lip, indicating post-1904. The only other identifiable specimen in the assemblage is an unmarked, milk glass jar lid liner.

Ceramics (n=12)

Ceramics recovered in Concentration 7 are presented in Table 2.15. The most notable specimens are the doll parts, a leg and a head (Fig.2.10c). These

Table 2.14. Ceramic assemblage from concentration 6.

Paste/Glaze Type	Count (Weight)	Functional Type
EARTHENWARE/IRONSTONE		
White glaze	7 (16.6g)	1 Cup
SEMI-PORCELAIN		
White glaze	1 (.3g)	
BRICK		
High Fire	(110.0g)	
High Fire with glazed surface	(33.0g)	

pieces do not appear to be from the same doll. Unfortunately, these specimens are not dateable.

Metal (n=1)

The only metal artifact from this concentration is unidentifiable.

Discussion

Concentration 7 represents a domestic assemblage. It is most likely associated with the household responsible for Concentration 1 and the individual artifacts lumped into Groupings G and H.

CONCENTRATION 8

Concentration 8 was the northeastern most of the concentrations. Like Concentration 7, Concentration 8's material extended into the treeline on the field's northern border.

Flat Glass (n=1)

A single specimen of green tinted flat glass 1.9 mm thick comprises this class.

Bottle Glass (n=11)

The bottle glass assemblage consists of two fragments of amber, two of aqua, three of clear, three of green tinted, and one of light amethyst. The only specimen of note is a clear glass piece embossed -DRUGG- (Druggist?) with an elaborate emblem, possibly on ornate monogram (Fig. 2.9g).

Ceramics (n=18)

The ceramic assemblage from Concentration 8 is presented in Table 2.16.

Agricultural (n=1)

The single element in this class consists of two pieces of round wire twisted into interlocking loops.

Blacksmithing (n=2)

Two fragments of very large horseshoes were recovered.

Table 2.15. Ceramic assemblage from concentration 7.

Paste/Glaze Type	Count (Weight)	Functional Type
EARTHENWARE/IRONSTONE		
White glaze	8 (32.8g)	1 Plate
PORCELAIN		
White glaze	2 (6.8)	1 Doll head 1 Doll leg
STONEWARE		
Albany glaze/ Albany glaze	1 (3.0g)	
Medium Brown glaze/ Buff glaze	1 (30.1g)	

Table 2.16. Ceramic assemblage from concentration 8.

Paste/Glaze Type	Count (Weight)	Functional Type
EARTHENWARE/IRONSTONE		
White glaze	9 (39.0g)	1 Plate
EARTHENWARE/CREAMWARE		
Pale Yellow glaze/ Pale Yellow glaze	1 (4.4g)	1 Sugar bowl
STONEWARE		
Albany glaze/ Albany glaze	3 (56.0g)	1 Crock
Albany glaze/ Brown Salt glaze	1 (12.0g)	
Albany glaze/ Buff glaze	1 (11.6g)	
Brick Red glaze/ Brick Red glaze	1 (38.5g)	
INDUSTRIAL/PORCELAIN		
White glaze	1 (11.0g)	1 Doorknob

Wire Nails (n=1)

The only wire nail recovered in Concentration 8 is a 20d nail.

Miscellaneous Tools (n=2)

Two metal pipe fragments are included in this class.

Metal (n=8)

Eight iron artifacts from Concentration 8 were unidentifiable.

Discussion

Concentration 8 is a domestic assemblage. It is possibly related to Concentration 1 and 7 and Groupings G and H.

SUMMARY AND CONCLUSIONS

The Phase IV historical archaeological investigations at El Dorado have substantially expanded our understanding of the historic period. On a more practical level, these investigations highlighted the inherent difficulties between documentary and archaeological research.

The testing programs at the Doc Lewellen and Donaldson sites were disappointing. Failure to locate the early historic deposits, leaves a critical gap in the archaeological record of the area. Yet, something was learned from those projects. The fact that documentary data is not enough is significant In addition, the absence of any historic material in the survey areas, suggests that deposits associated with the early historic period are very light, possibly indicating minimal use of breakable items. Using what was learned in Phase IV, it is recommended that surveys of poorly documented sites be undertaken as well as those better recorded ones - the probabilities of success are likely to be equal.

The mapping and surface collecting procedure at the New Chelsea site was a great success. Artifact assemblages are now available for at least five different types of occupations in the town. The large number of specimens

identifiable as to point of origin will significantly increase future analyses of economic networks in the area. Also significant is the degree of correspondence between archaeological data and written records: four assemblages show a particularly strong relationship but more than half of the total assemblage comes from areas about which there are no written records. The Phase IV investigation has demonstrated how historical and archaeological data can complement and supplement one another.

An expansion of the mapping and collecting procedure to the rest of the site would contribute more data about the town's development. In addition, excavation in areas where the materials are collected may reveal intact subsurface features and deposits that can be used to reconstruct structures and behavioral patterns.

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CHAPTER 3

A SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT EL DORADO LAKE, 1977-1980

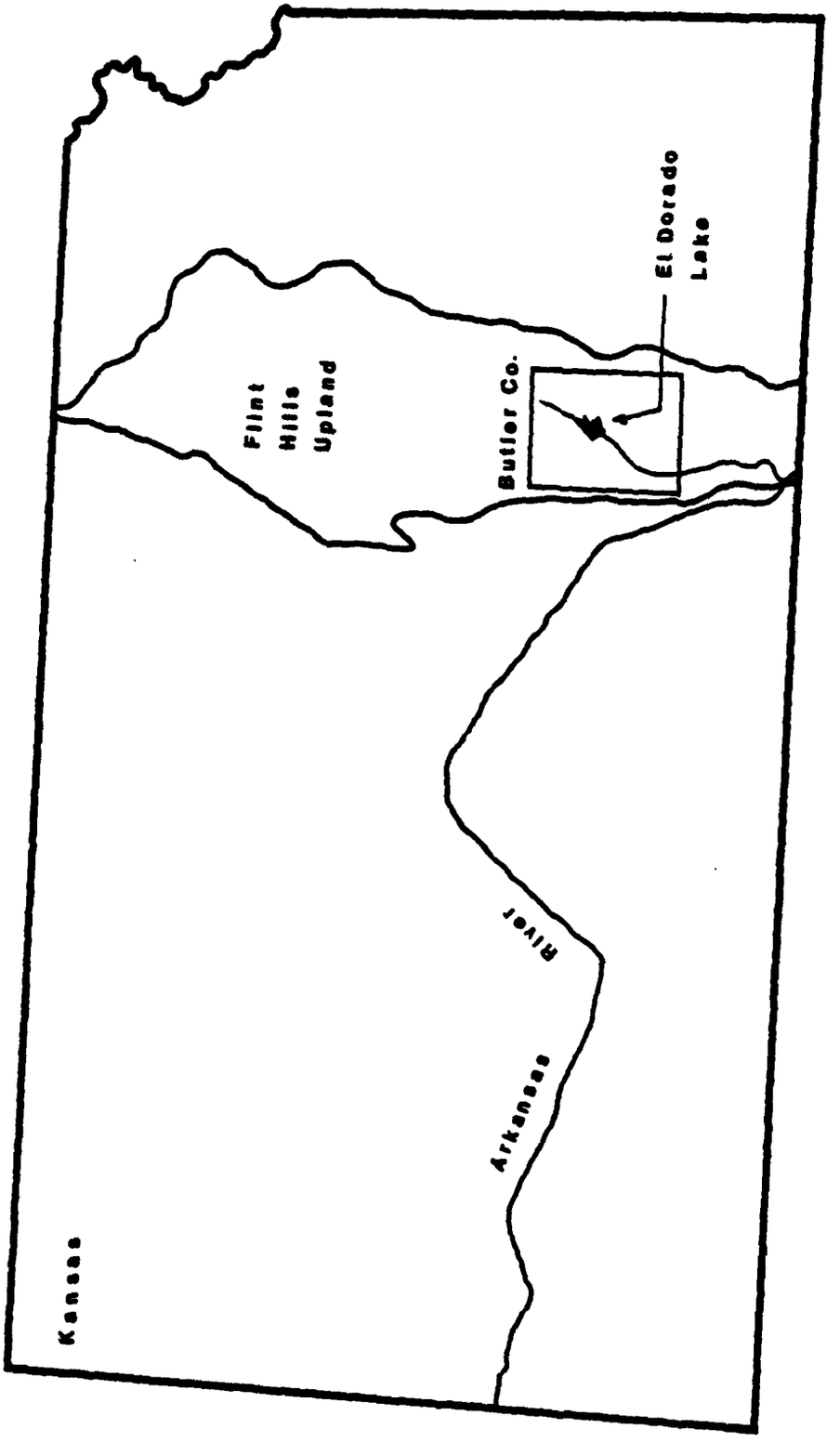
by

Alfred E. Johnson

In 1967, the Museum of Anthropology at the University of Kansas entered into a contract with the National Park Service to conduct a survey of the prehistoric archaeological resources of El Dorado Lake, being planned for construction by the U.S. Army Corps of Engineers on the Walnut River in Butler County, south-central Kansas (Fig. 3.1). The survey resulted in the discovery of 28 sites, several of which were deemed to have potential significance sufficient to warrant study prior to their destruction as a result of construction activities or inundation.

This survey was the initiation of a long-term project for the Museum, now drawing to a close (1981) with the nearing completion of El Dorado Lake. Major goals of the project, throughout its history, have been contributions to the theory, methodology, and substantive base of anthropological archaeology, and mitigation of the effect of dam construction on the local cultural resources through data recovery. Funding for the project, provided by the National Park Service, the Butler County Historical Society, and the University of Kansas, was limited and sporadic from 1967 until 1977. At the latter date, and as a result of legal obligations resulting from recently-passed federal legislation, the U.S. Army Corps of Engineers (Tulsa District) assumed responsibility for completion of the mitigative effort. The present report is a summary of the results of this effort. A summary of accomplishments of the period from 1967 to 1977 is readily available (Leaf 1979a:5-15), while the bibliography following

Figure 3.1. Map showing location of El Dorado Lake (from Drew 1981, Fig 1.1)


El Dorado
Lake
Butler Co.
Flint
Hills
Upland
River
Arkansas
Kansas

(Appendix 1) lists all of the publications ard manuscripts completed to date as a result of work of the Museum at El Dorado Lake.

In 1976, prior to initiation of the U.S. Army Corps of Engineers sponsored effort to complete the mitigation of the effect of the construction of El Dorado Lake on local cultural resources, the Museum developed a comprehensive research design (Leaf 1976). Following review, by both the Corps of Engineers and the National Park Service (Interagency Archaeological Services), this design was judged acceptable as a guide for future investigations. As set forth in the research design, principle goals of the project were: "(1) to retrieve data and test hypotheses on prehistoric subsistence and settlement systems; and, (2) to conduct an interdisciplinary program to retrieve data and test models of paleoenvironments useful for the study of prehistoric cultural-ecological relationships. Operationally, these enquiries are organized in such a manner so as to maximize the rescue of relevant data from the present to the time of dam closure in 1980" (Leaf 1979a:1).

In so far as possible, within limits imposed by restricted funding, time, and personnel availability, the Museum has adhered to the goals set forth in the research design. One major addition came about as a result of site survey work in 1977, which indicated the presence of numerous sites of the historic period at the Lake. As summarized below, significant attention has been devoted to developing an understanding of the historic period occupation complementary to that of the prehistoric.

PALEOENVIRONMENTAL MODELING

As set forth in the research design for the El Dorado project, a major goal has been to contribute to a better understanding of the envir-

onments of the past to which the prehistoric and historic occupants of the area had to adjust. Attempts to achieve this goal have taken two directions, one successful, the other not. The successful approach is a result of the study of the local geology, soils, and geomorphology, while the unsuccessful is palynology. In an attempt to asses the potential of palynology as a means to reconstruct local vegetation patterns (which are in turn interpretable in terms of broadscale environmental factors), the Museum sub-contracted with James King of the Illinois State Museum, to collect and analyze pollen samples from several locations at El Dorado Lake. Unfortunately, "none of the samples collected from the several localities in the El Dorado project yielded any pollen" (King 1979:206). Despite the negative results of this particular test, King (1979:206) is careful to point out the capricious nature of pollen preservation. His encouragement for additional studies in this locality is proving well-founded, especially with the application of new techniques for the recovery and extraction of pollen (W. Johnson, Dept. of Geography, University of Kansas, personal communication).

More successful have been geomorphological studies, which suggest (Figs. 3.2, 3.3), in outline, the nature of several Pleistocene and Holocene events which have shaped the present configuration of the El Dorado Lake area. Earlier events include an erosional stripping of the Walnut Valley to bedrock (excepting a residual coarse stream gravel), deposition of a reddish-colored regolith (possibly loess), and washing of portions of this regolith into the valley to form a red alluvium. Modern remnants of the red alluvium are equated with the T-1 and the Norge Soil Series. At least two periods of extensive erosion can be identified following the de-

Figure 3.2. Composite cross section of the present upper Walnut River valley Kansas, El Dorado Lake project (from Drew 1981b Fig. 1.4)

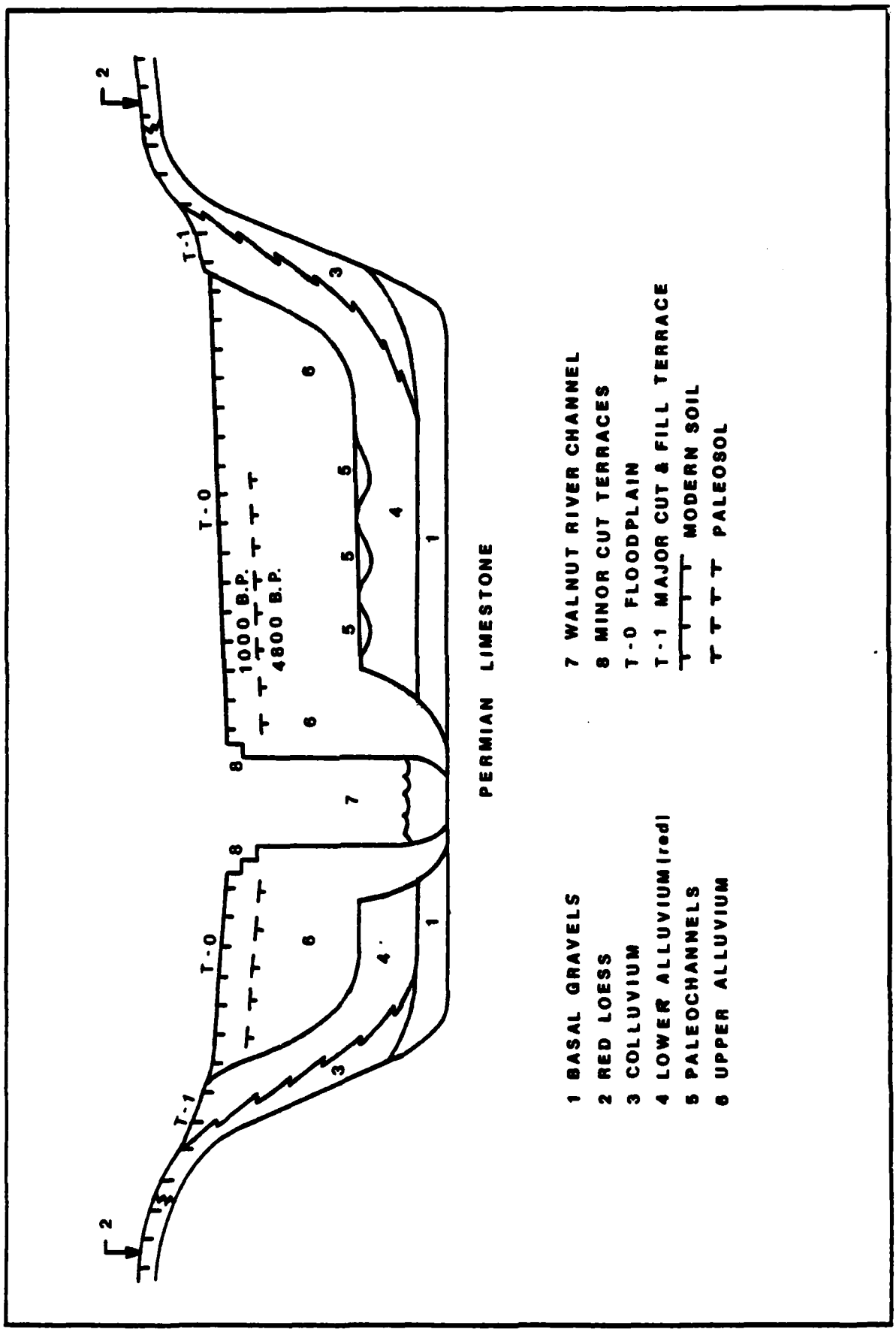
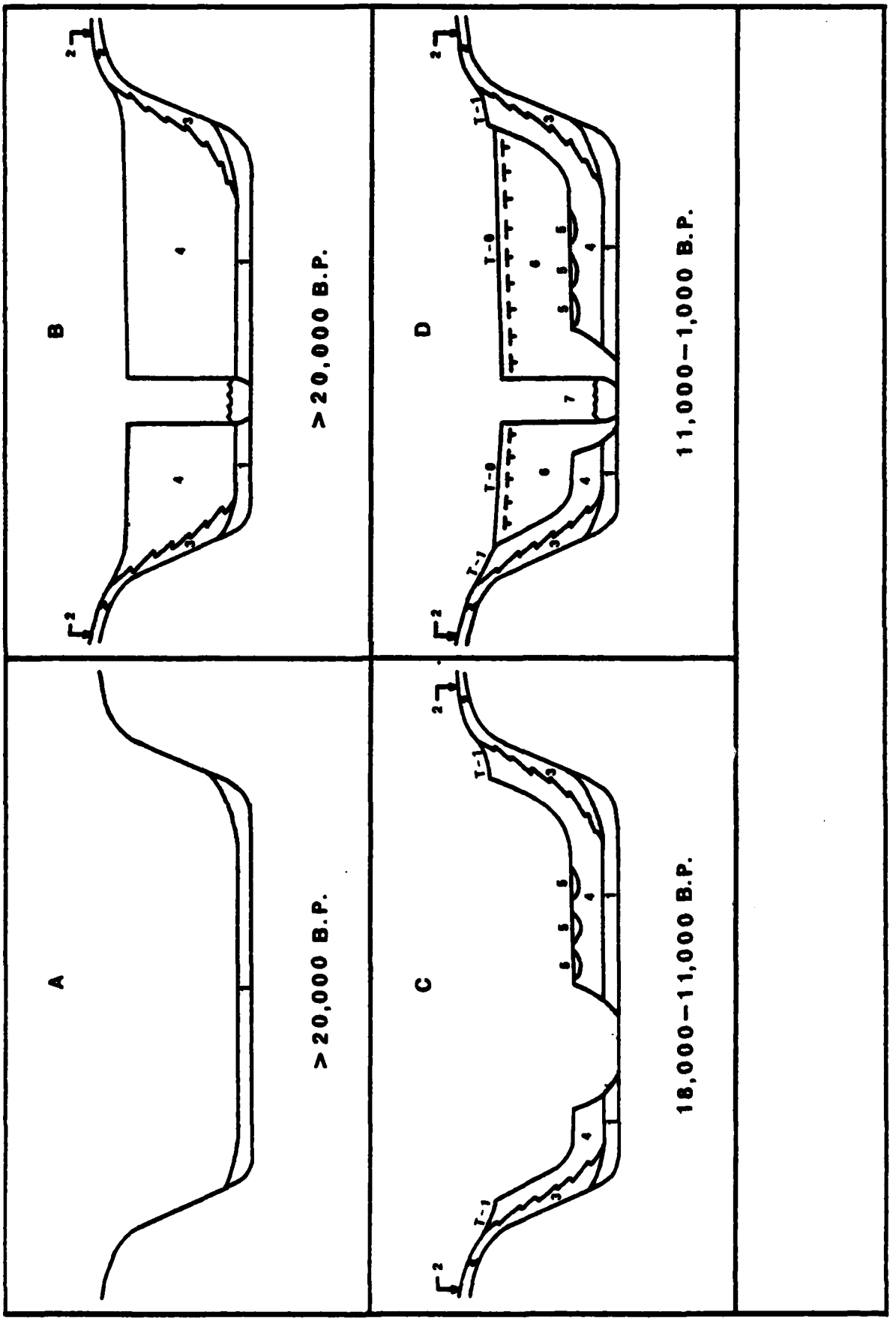

2
T-1
T-0
1000 B.P.
4800 B.P.
PERMIAN LIMESTONE
1 BASAL GRAVELS
2 RED LOESS
3 COLLUVIUM
4 LOWER ALLUVIUM (red)
5 PALEOCHANNELS
6 UPPER ALLUVIUM
7 WALNUT RIVER CHANNEL
8 MINOR CUT TERRACES
T-0 FLOODPLAIN
T-1 MAJOR CUT & FILL TERRACE
MODERN SOIL
PALEOSOL

Figure 3.3. Geological history of the upper Walnut River valley, Kansas, El Dorado Lake project (from Drew 1981b, Fig. 1.5)


A
> 20,000 B.P.
B
> 20,000 B.P.
C
18,000–11,000 B.P.
D
11,000–1,000 B.P.

position of the red alluvium. Field examination of deposits leading to this history of events have, unfortunately, not produced datable associations, and as a consequence, it is not possible to assign temporal estimates more precise than those indicated on Figure 3.3. The estimates are based on postulated rates of geological processes and radiocarbon dates from archaeological sites buried in overlying alluvial deposits (Drew 1981: 2-7).

Holocene valley filling, initiated by perhaps 11,000 B.C., resulted in the deposition of a gray upper alluvium. Periods of temporary stability are indicated by the presence of paleosols. Detailed study of one of these paleosols, which incorporates Late Archaic archaeological deposits, indicate the paleosol was formed on a deposit which was aggrading slowly between ca. 2000 B.C. and A.D. 1, the aggradation perhaps a function of low intensity, basin-wide floods. From ca. A.D. 1-1000, the Woodland archaeological period in this area, alluvial deposits are indicative of a period of disequilibrium, probably a result of increased rainfall in the form of convectional storms. By ca. A.D. 1000, equilibrium had once again been achieved, with establishment of an esssentially modern rainfall pattern and stream regime. Correlations, based on soil, geomorphic, radiocarbon, and archaeological data, suggest a similar pattern from western Missouri into southwestern Oklahoma (Artz 1980).

In summary, geomorphological studies conducted as an integral part of the El Dorado Lake project, have produced new data helpful in predicting the location of buried archaeological sites and in reconstructing the nature of past environmental settings to which the inhabitants of the prehistoric Central Plains had to adjust. More detailed interpretations are anticipated with completion of two additional studies currently underway.

PREHISTORIC ARCHAEOLOGY

As it had not been set as a goal of the pre-1977 archaeological investigations at El Dorado Lake, a complete inventory of surficial site locations was not available for either the research endeavors of the archaeologists or the management responsibilities of the Corps of Engineers. As a consequence, a major focus of the 1977 season was a search for new sites, as a supplement to the data on 51 which had accumulated previously (Root 1979:31). Special attention was devoted to an attempt to "locate sites in the upland prairie and hillside areas between the flood pool of El Dorado Lake and federal property boundaries, and in areas along the Walnut River and its feeder creeks with unexpected low site density" (Root 1979:31).

This search resulted in the discovery of 15 new sites, bringing the total to 66 for the federal property at El Dorado Lake (Fig. 3.4). This total includes a surprising number of buried sites (e.g., 14BU9--Snyder; 14BU25--Milbourg; 14BU81), discovered accidentally as a result of exposure through recent erosion or an occasional deep trench in a site with surficial remains. It seems likely that the total for the Lake could be increased significantly if resources were available for a systematic soil probe and mechanized trenching program in those portions of the valley fill which our soil-geomorphic studies indicate have the highest potential.

Several of the sites at El Dorado Lake were reoccupied and as a consequence, 75 occupational components can be recognized. As diagnostic artifacts were not recovered from 30 components, these cannot be assigned to culture-historical taxa. The others can be assigned as follows: Late Archaic (ca. 3500 B.C.-A.D. 1)--16; Plains Woodland (ca. A.D. 1-1000)--24; Plains Village (ca. A.D. 1000-1700)--5.

Figure 3.4. Map showing the location of prehistoric archaeological sites at El Dorado Lake (from Root 1979, Fig. 2.2.)

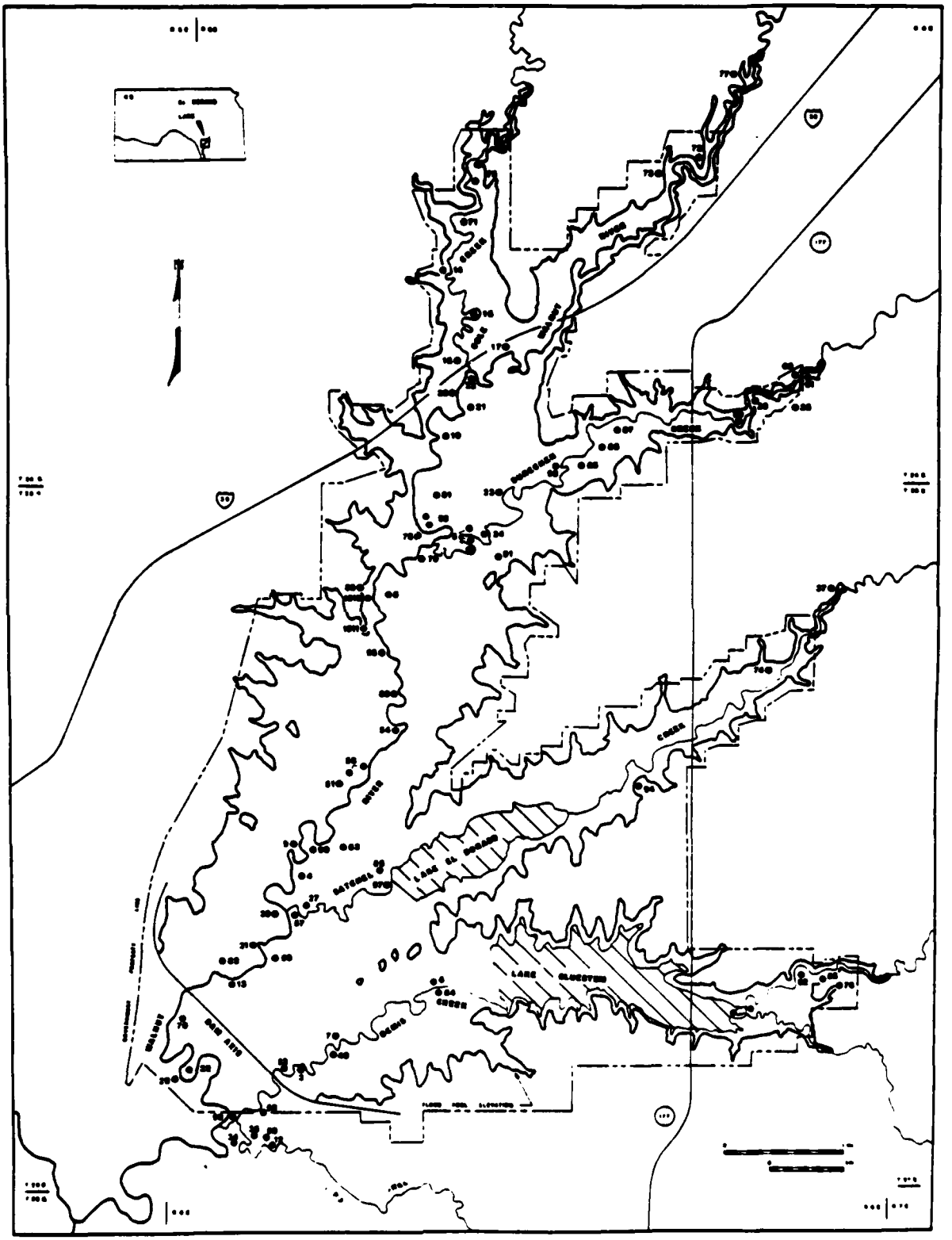


Table 3.1. Prehistoric archaeological sites tested at El Dorado Lake from 1977 through 1980.

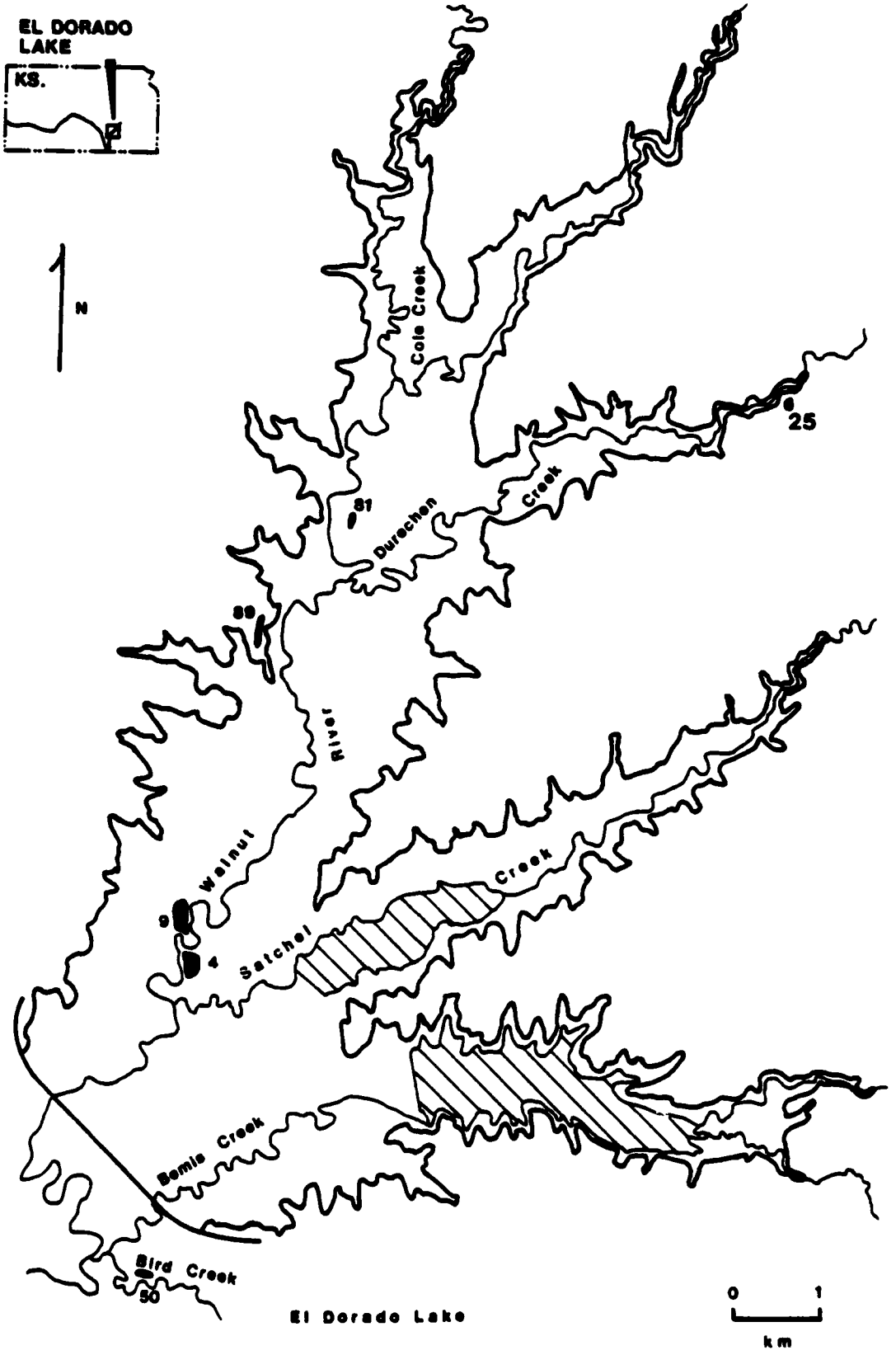
Site	Year Tested	Cultural Affiliation(s)	Reference
14BU5	1978	Plains Woodland	Parisi 1981:76-108
14BU16	1978	Plains Woodland	Artz 1981a:60-77
14BU27	1977	Plains Woodland	Leaf 1979:173-187
14BU30	1977	Plains Village	Leaf 1979b:158-172
14BU31	1977	Plains Woodland	Leaf 1979b:78-111
14BU32	1979	Plains Woodland	Leaf and Root:1-46
14BU57[1]	1977	Plains Woodland-- Plains Village	Leaf 1979b:112-141
14BU72	1980	Plains Woodland	Parisi 1981:14-48
14BU73	1980	Unknown	Parisi 1981:48-75
14BU81	1978	Walnut phase El Dorado phase Chelsea phase - ?	Artz 1981a:77-119
14BU82	1977	Plains Village Plains Woodland Archaic	Leaf 1979b:141-158
14BU87	1978	Plains Woodland Walnut phase - ?	Artz 1981a:119-146

[1]Large-scale excavations were subsequently conducted at 14BU57 in 1979 (M. Brown 1981).

Table 3.2. Large-scale excavations in prehistoric sites at El Dorado Lake, 1977-1980.

Site	Year(s) Excavated	Reference
Snyder - 14BU9	1978,1979	Leaf and Haury 1981; Leaf 1981
Two Deer - 14BU55	1978,1979	Adair and Brown 1981; Adair 1981
Nuttal - 14BU4	1979	Artz 1981b
14BU57	1979	M. Brown 1981

Figure 3.5. Location of Archaic sites within the El Dorado Lake area (from Root 1981b, Fig.31).


EL DORADO LAKE
KS.
N
Cole Creek
25
87
Durechon Creek
89
Walnut River
9
4
Satchel Creek
Bemis Creek
Bird Creek
50
El Dorado Lake
0
1
km

In addition to the survey, another goal set by the research design was a systematic program of testing designed to collect data on "the number, areal extent, internal structure, and cultural affiliation of archaeological components recognized at each site" (Artz 1981a:54). Prehistoric sites tested from 1977-1980 are listed in Table 3.1. Large-scale excavations were planned for a limited number of especially significant sites, and those accomplished are listed in Table 3.2.

THE ARCHAIC PERIOD

One of the most recent overviews of the archaeology of the Great Plains notes that, "Plains Archaic materials in the Central and Southern Plains are not well known" (Wedel 1978:199). Although we have not encountered deposits of material culture remains that pertain to the earlier portions of the Archaic, we are, as a result of the work at El Dorado Lake, able to contribute to a fuller understanding of the nature of Late Middle and Late Archaic developments (Fig. 3.5).

Much of our knowledge of the Late Archaic at El Dorado Lake comes from excavations at 14BU9, the Snyder site. As well be apparent from an examination of Table 3.3, not only is Snyder important to an understanding of local developments at El Dorado Lake, but as well, it provides, through its long stratigraphic sequence, the means to organize much of the scattered data on the Late Archaic from the remainder of the State of Kansas.

Data from occupation zones at the Snyder site have permitted the definition of four phases of occupation (Grosser 1973: 228-38). For the most part, the Woodland Butler phase (about A.D. 200-800) deposits are

Table 3.3. Middle and Late Archaic radiocarbon dates, archaeological sites, and culture-historical taxa from eastern Kansas and western Missouri. All dates have been converted to years before Christ.

	Walnut River	Neosho River	Big Blue River	Kansas City Locality
A.D.1				
	Walnut Phase		Walnut Phase	Early Woodland
	20±110 - Snyder[1]		370±60 - Coffey[5]	350±100 - 23JA40[7]
	110±80 - Snyder		530±55 - Coffey	395±70 - Traff[8]
				450±85 - 23JA36[7]
				505±80 - Traff
500 B.C.				
	El Dorado Phase	El Dorado Phase		Nebo Hill Phase
	1290±85 - Snyder	1650±100 - Williamson[3]		
	1700±140 - Snyder	1750±100 - Williamson		1020±49 - Sohn[9]
	1960±160 - Snyder			1605±65 - Nebo Hill[10]
	2030±100 - Snyder			2600±115 - Turner - Casey[11]
2000 B.C.				
	Chelsea Phase	Munkers Creek Phase	Black Vermillion Phase	
	2200±110 - Snyder?		2890±95 - 3730±135 - Coffey	
	2485±100 - Milbourn[2]		2265±180 - DeShazer Creek[6]	
	2650±125 - Snyder?		3370±790 - DeShazer Creek	
	2880±105 - Snyder?	3390±160 - Munkers Creek[4]		
3500 B.C.				
	Unknown Phase			

[1]Grosser 1977; [2]Root 1981b:ii; [3]Schmits 1980; [4]Witty 1962, 1969; [5]Schmits 1981, Table 1; [6]Schmits 1981:187; [7]Ziegler 1981; [8]Wright 1980; [9]Reeder 1980:63; [10]Reid 1980, Table 2.1; [11]Schmits and Wright 1980

restricted to the plow zone (A), but also extend into a lower, discontinuous Zone B. Three Archaic phase occupations occur below a deposit of sterile yellow-brown clay (Zone C). Zone D, which contains the evidence for the three Archaic phases, is a mottled, dark, gray-brown soil, varying from 1 to 1.5 m thick. The uppermost Archaic occupation, the Walnut phase, is characterized by small, corner-notched projectile points and an associated tool kit suggesting that hunting was a major subsistence activity. Radiocarbon dates are 20±110 B.C. (N-769) and 110±80 B.C. (N-1276), while typological similarities of the artifacts suggest a range from about 1200 B.C. to A.D. 1.

Changes in artifact styles and earlier radiocarbon dates separate the earlier El Dorado phase deposits from those of the Walnut phase. El Dorado phase projectile points are long, narrow, and stemmed, with straight or convex bases, similar to Dustin and Lamoka points from the eastern United States. Four associated radiocarbon dates range from 1290±85 B.C. (N-1277) to 2030±100 B.C. (N-1278). A different style of projectile point, along with a somewhat different lithic assemblage, and greater stratigraphic depth in Zone D provide justification for identifying a third Archaic phase, Chelsea. Chelsea phase projectile points have broad, oval blades, concave bases, and shallow corner or side notches. Radiocarbon dates from levels immediately below Chelsea deposits are 2650±125 B.C. (N-1280) and 2880±105 B.C. (N-1269) (Grosser 1973; 1977).

The El Dorado phase is of special interest in understanding adaptive patterns during the Plains Archaic. Features associated with this phase included extra-mural hearths, burned limestone concentrations, storage pits, and a flexed burial. Excavations have not yet succeeded in defining the form, but habitation structures are indicated by post molds, con-

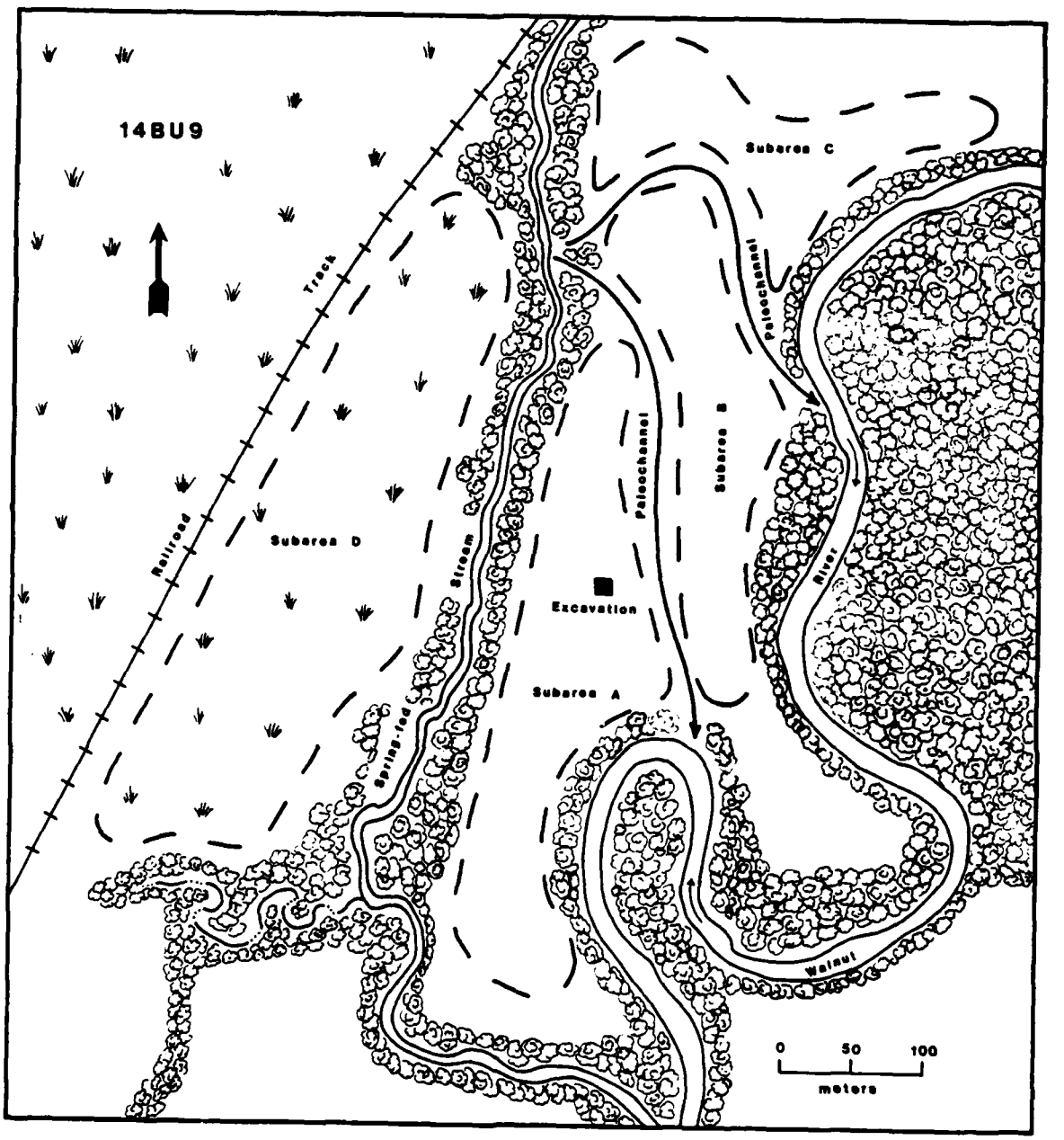
centrations of burned daubing clay, and fired mud dauber's nests. Taken as a whole, the El Dorado phase features suggest an occupation area of some permanence (Grosser 1973, 1977; Klepinger 1972).

Resources exploited by the El Dorado phase inhabitants at Snyder include 17 species of mammals, two of fish, one amphibian, two species of reptiles, two of birds, fresh water mussels, and the seeds of Celtis, Amaranthus, and Chenopodium. No evidence for tropical cultigens has yet been found. The variety of resources exploited indicates that the El Dorado phase can be characterized as a diffuse adaptive pattern in the Cleland (1976) model. This interpretation is supported by the varied lithic assemblage, which includes six styles of projectile points (in addition to the diagnostic Dustin points), seven varieties of knives, as well as drills, choppers, chipped axes, scrapers, grinding stones, and hammerstones. The only artifacts of bone are tubular beads (Grosser 1977).

As a consequence of our knowledge of the importance of the Snyder site to an understanding of the Late Archaic period in the Plains (as summarized above), one of the major excavation projects undertaken, with Corps of Engineers support, was at the Snyder site. The goals of this project were to gain types of data not collected during earlier tests, and larger samples of types of data poorly represented (Grosser 1977). These goals were accomplished through application of state-of-the-art techniques, including large-scale water screening and floatation and three-dimensional piece plotting of artifact locations. Back-hoe-trenching was used to determine the spatial extent and depth of the deposits, and to open exposures for the collection of soil and pollen samples.

A 10 x 10 m. block excavation was opened at the Snyder site (Fig. 3.6) and carefully excavated using the procedures noted above to a depth of

Figure 3.6. Map of the Snyder site, 14BU9 (from Leaf 1981, Fig. 4.2).

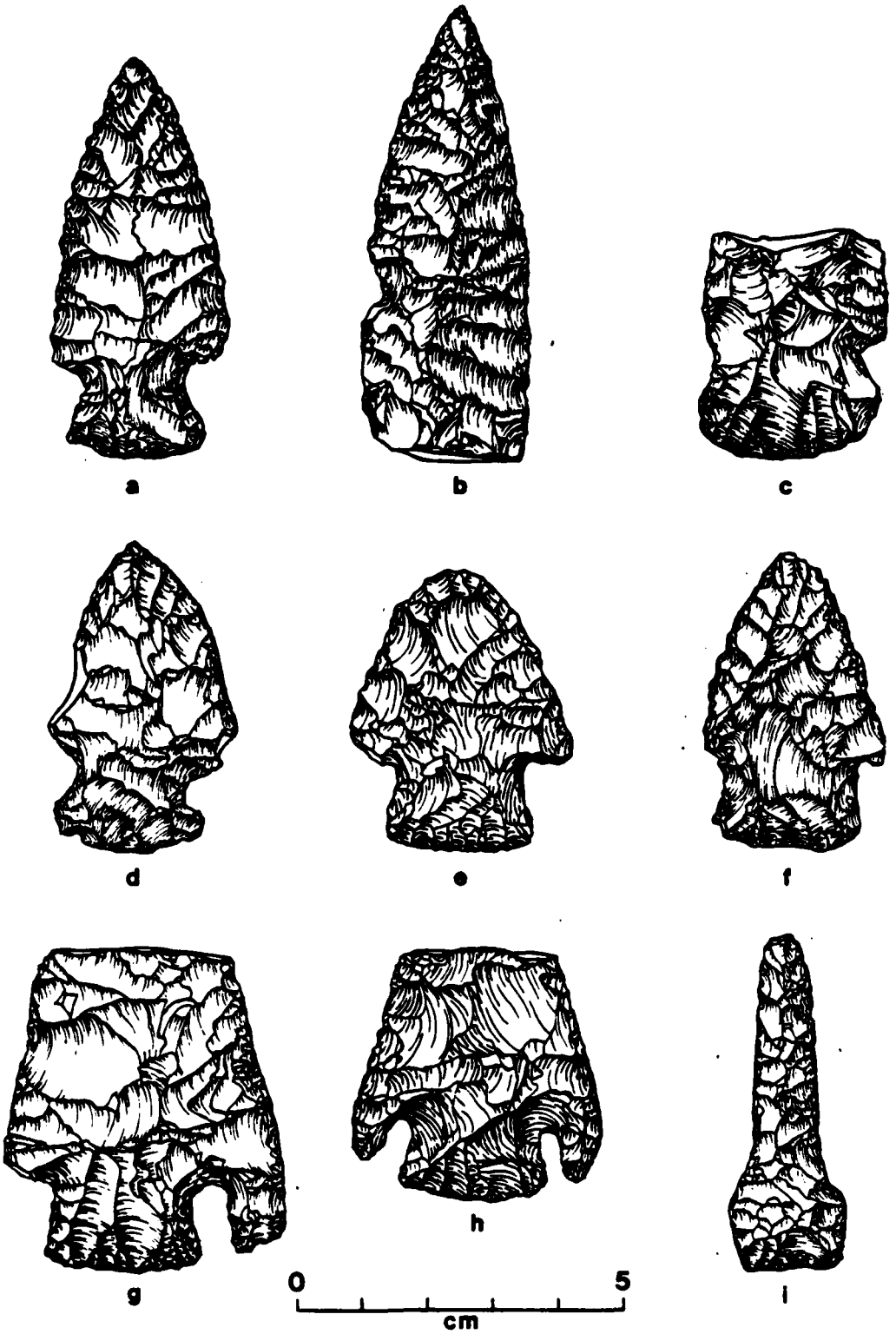

14BU9
Subarea C
Paleochannel
Subarea B
Railroad
Tracks
Subarea D
Spring-fed Stream
Paleochannel
Excavation
Subarea A
Walnut River
0 50 100
meters

140 cm. below surface. At this depth, samples have been drawn from Woodland, Walnut phase, and El Dorado phase deposits. Unfortunately, resources were not available to further sample the Chelsea phase deposits, nor to learn more of the nature of an apparently extensive pre-Chelsea deposit (Haury and Leaf 1981), which is known only from one hand-dug and several back-hoe trench excavations. The lost opportunity to sample this pre-Chelsea deposit is especially regrettable as it potentially might have informed us of the nature of Middle or Early Archaic adaptive patterns, which remain essentially unknown in this portion of the Plains.

Although work at the Snyder site was halted before the Chelsea phase deposits were reached, some additional information is available on this phase from limited excavations at other sites in the Lake area. The Milbourn site, 14BU25, is hypothesized to have been a base camp, reoccupied during several different warm seasons by groups of hunters pursuing bison, proghorn, wapiti, and deer. Rather than an area of permanent occupation, the upper Walnut River Valley may only have been a hunting territory for populations to the south and east. A radiocarbon date of 2485±100 B.C. (UGa-2806) relates the site to the Chelsea phase (Table 3.3) as do artifact similarities (Root 1981b). Interestingly, a much larger sample of hafted bifaces from Milbourn (Fig. 3.7), than is available from Chelsea phase deposits at Snyder (Grosser 1977), indicates striking similarities with the hafted bifaces from the Coffey site (Miller 1979), to the north at Tuttle Creek Lake. Details of the interaction implied by these similarities remain problems for the future.

While the quantity of debris, and the variety of activities suggested by an analysis of this debris (Root 1981b), indicates the Milbourn site

Figure 3.7. Stemmed bifaces from the Milbourn site, 14BU25 (from Root 1981b, Fig. 26).


a
b
c
d
e
f
g
h
i
0
5
cm

was a base camp, studies of the buried Archaic component at the Nuttal site, 14BU4, point to another aspect of the Chelsea phase settlement system, a task-specific locus. The five spatially-distinct clusters of artifacts uncovered are consistent assemblages of chipping debris, resulting from the manufacture and maintenance of tools, especially projectile points. Locally-available Florence A chert (Haury, In Press), was brought to the site in the form of heat-treated cores. Evidence for small open fires was discovered, and burned bone suggests that meat was cooked and eaten. All in all, the data from 14BU4 point to a hunting camp (Artz 1981b:33-4).

Although limited in quantity, the variety of tools, as well as the presence of a few features (2 hearths, 3 post stains, 2 pits) suggest that the Chelsea phase occupation of the Snyder site may be interpretable as that of a base camp (Grosser 1977). This is also the case for the Milbourn site, while data from Nuttal suggest a temporary hunting camp. Perhaps then, the Chelsea phase occupation of the upper Walnut River valley can best be interpreted as a result of the seasonal round of groups of hunters and gatherers, normally resident further to the south and east, who, during the warm season of the year, established bases for hunting operations with hunts also conducted from temporary camps. Desirability of the location would seemingly stem from the presence of abundant chert resources for the manufacture of tools, a reliable supply of potable water in spring-fed streams, cover and firewood in the gallery forests along the Walnut and tributary streams, and perhaps most important, proximity to the herd animals of the blue-stem prairie.

Data on the Late Archaic El Dorado phase are available from excavations at the Snyder site, 14BU9 (Grosser 1977; Leaf and Haury 1981), and

from test excavations at 14BU81 and 14BU89. As summarized above, an occupation of some permanency is indicated for the El Dorado phase component at the Snyder site. This "base camp", seemingly provided a focus for pre-agricultural hunters-and-gathers who also operated from temporary hunting camps such as at 14BU89 (Artz 1981a:119-146). Insufficient data are available from 14BU81 to permit an assignment of function, although the site is notable for its stratigraphic similarities to Snyder. At the surface is a Walnut phase component, which is underlain by El Dorado phase materials. A third component, unfortunately lacking diagnostics, but perhaps equatable with the Cheslea phase, is present at depths greater than 90 cm. below surface.

An El Dorado phase component has also been identified at John Redmond Lake on the Neosho River, approximately 50 miles north and east of El Dorado Lake (Schmits 1980). This spread suggests the phase is of regional import, and consequently of significance to the eventual development of an understanding of the prehistory of the Central Plains.

A third, less well known, but important, Late Archaic phase recognized for the El Dorado Lake area is the Walnut. Radiocarbon dates for the phase, only available from the Snyder site are 110±80 B.C. (N-1276) and 20±110 B.C. (N-769). Grosser (1973:228-38), on the basis of comparative studies, suggests the phase may have a duration of approximately 1200 years (ca. 1200 B.C.-A.D. 1). Notable among the artifacts associated with the Walnut phase are small "Walnut Valley Corner Notched" projectile points, which are of a size appropriate for use on an arrow, and so are among the earliest indicators of the introduction of this new set of technological equipment (bow-and-arrow) to this portion of the Plains.

Despite the implications of this latter statement for an understanding

of Plains prehistory, precious little is known of the Walnut phase. In addition to samples from the Snyder site (Grosser 1977; Leaf and Haury 1981), limited data on the phase are also available from the surface of 14BU81 (see above), and possibly from 14BU87. It is unfortunate that resources were not available for a large-scale excavation at the latter site, as test excavations disclosed a buried archaeological component in deposits which could be correlated with deposits which contained the Walnut phase component at the Snyder site. No diagnostics were forthcoming from the tests in the buried archaeological level at 14BU87 (Artz 1981a:154).

Although ceramics have not yet been recovered from Walnut phase components (and for this reason, in addition to the early radiocarbon dates, the site is assigned to the Archaic), it is interesting to note the similiarities between Walnut phase lithic tools (Grosser 1977), and those from the Traff site, located on the Little Blue River in Jackson County, Missouri (Kansas City locality) (Wright 1980). Ceramics, resembling the Early Woodland diagnostic type Black Sand Incised (Griffin 1952:98, Pl. 28), are present at Traff. Radiocarbon dates from Traff are 395±70 B.C. (UGa-2535) and 505±80 B.C. (UGa-2404), suggesting a rough temporal equivalency to the Walnut phase. Although Early Woodland sites have not yet been identified to the west of the Missouri River in the Central Plains, special attention should be devoted to data recovery in future excavations in Walnut phase components in search of ceramics.

PLAINS WOODLAND

Although many facets of the human adaptive patterns recognized in the El Dorado Lake area for the Late Archaic period undoubtedly continued after the time of Christ, important innovations, including pottery vessels

Table 3.4. Radiocarbon dates from Woodland sites in the El Dorado Lake area (based on a half-life of 5568 years). From Artz, In Preparation.

Lab Number	Site	Context	Radiocarbon Years B.P.	Calendar Date (Uncorrected)
*UGa-2561[c]	14BU9	Composite sample from flotation	520 ± 55	A.D. 1430
*UGa-3044[a]	14BU32	XU103/XU104 (composite sample)	720 ± 70	A.D. 1230
UGa-1347[d]	14BU71	Feature 2 (limestone-filled pit)	740 ± 75	A.D. 1210
UGa-3137[e]	14BU57	Excavation Unit 5 (composite sample)	755 ± 235	A.D. 1195
UGa-1345[d]	14BU55	House 1	890 ± 60	A.D. 1060
UGa-2504[b]	14BU55	1 m^2 excavation unit (composite sample)	950 ± 135	A.D. 1000
UGa-1346[d]	14BU55	House 1	970 ± 80	A.D. 980
UGa-2501[b]	14BU55	Feature 18 (charcoal concentration)	984 ± 45	A.D. 965
UGa-2500[b]	14BU55	Feature 6 (charcoal concentration)	1065 ± 65	A.D. 885
UGa-2503[b]	14BU55	Feature 19 (post mold)	1090 ± 55	A.D. 860
UGa-2560[f]	14BU31	Feature 3C2 (limestone-filled pit)	1215 ± 55	A.D. 735
UGa-2807[c]	14BU31	Feature 304 (limestone-filled pit)	1240 ± 75	A.D. 710

*Dates rejected because of recency or stratigraphic inversion.

[a]Leaf and Root 1981; [b]Adair and Brown 1981; [c]unpublished; [d]Fulmer 1977; [e]Brown 1981; [f]Root 1981.

and domesticated plants (Adair and Brown 1981:237-356) were added during the Plains Woodland period (A.D. 1-1000). The earliest radiocarbon date from an El Dorado Lake Plains Woodland component is A.D. 710±75 from 14BU31 (Table 3.4), a site tested in 1977 (Table 3.1). An even earlier Plains Woodland component at the Snyder site (14BU9) is suggested by the presence of sherds with Middle Woodland design elements (Grosser 1970:94-5). Middle Woodland expressions in this region date between A.D. 1 and 500 (Johnson 1979). The presence of other styles of Woodland pottery (Grosser 1970, Table 32) at Snyder and the indications of spatial separation of these differing styles (Grosser 1970:159-61) suggest several reoccupations over a long period of time. Unfortunately, much of the Woodland data at Snyder has been disturbed by plowing, although recent excavations demonstrate the presence of intact lenses of Woodland material in the Vanoss surface soil which overlies the paleosol that contains Archaic deposits. The sample of more than 11,000 artifacts (many of which came from two concentrations), in association with postmolds and wattle-and-daub fragments, obtained from upper levels of the 10 x 10 m. block excavation begun in 1978, leads to the inference that the site was not only used in a transitory way, but as the locus of a hamlet or small village, possibly occupied for more than a single generation (Leaf 1981:220-1).

As previously summarized (Root 1981a:357):

> 14BU31 was test excavated in 1977; investigations are thoroughly described by Leaf (1979). The site represents the remains of a small Woodland base camp, located along the Walnut's west bank. Cultural debris is scattered over a 1.0 ha. area, but river meandering may have destroyed as much as half the site. Limited investigations consisted of excavating two 2 by 2 m. test units and digging three backhoe trenches. Stone tools made of local and exotic cherts; limestone tempered, cord marked ceramics; food remains and cooking facilities were present. Possible subsistence items include fish, molluscs,

> rabbit, seeds, and nuts. Activities carried out at or associated with the site include food preparation and consumption, tool manufacture, wood working, hide scraping, hunting, and butchering. Ceramic vessels may have been used for food preparation and/or storage. Inferred activities indicate a hunting and gathering subsistence mode. A date of 1215±55 radiocarbon years: A.D. 735 (UGa 2560) was obtained from a wood charcoal sample recovered from feature 302.

Subsequently, a second date from a separate sample was forthcoming--1240± 75 B.P. or A.D. 710 (average of the two--A.D. 723).

The most substantial data set on the nature of Plains Woodland hamlet or village occupation at El Dorado Lake is forthcoming from large-scale excavations at the Two Deer site, 14BU55 (Adair and Brown 1981; Adair 1981). Two deer, situated along Bemis Creek an eastern tributary of the Walnut River, dates to approximately A.D. 1000±25 (average of six radiocarbon dates--Table 3.4). A large sample of artifacts, and smaller but significant, samples of faunal and floral remains were obtained from within and around the remains of two structures. Although difficult to define, one of the structures was apparently a surface, wattle-and-daub covered domicile oval to rectangular in outline, and measuring about 12 m. in diameter. Concentrations of domestic debris, including pottery sherds, lithic tools, faunal and floral remains, and burned limestone fragments, and two metates, within the structure were useful in deliniating its outline and extent (Adair 1981). The second structure, marked by 13 post mold stains, outlining a portion of a rectangle with rounded corners oriented with its long axis from northeast to southwest, lacked a similar concentration of domestic debris and may, therefore, represent an extra-mural ramada or drying rack. Portions of structure two had been destroyed by erosion (Adair 1981).

Faunal remains, including deer, racoon, beaver, rabbit, bison, and

turtle, were poorly preserved, in part, probably as a result of the practice of using crushed bone for pottery temper (Adair and Brown 1981, Table 5.5). Floral remains are abundant and suggest the inhabitants of 14BU55 may have utilized as many as 40 different genera of native wild plants, while relying heavily on three: Chenopodium spp.--goosefoot; Juglans nigra--black walnut; and Quercus sp.--acorns. The presence of two tropical cultigens, Cucurbita pepo and Zea mays, along with the seeds of Helianthus annua (sunflower) of a size large enough to indicate domestication, demonstrate at least a partial reliance on agriculture (Adair 1981, Table 8).

An important long-standing problem in the culture-history of the Central Plains is the relationship between the Plains Village tradition, dated from A.D. 1000-1700, and the Plains Woodland tradition, from A.D. 1-1000. Two Deer offers data towards the solution of this problem in that it dates to the period of the assumed transition from Plains Woodland to Plains Village. The presence of artifacts, including corner-notched and side-notched arrow points and elongate and globular cord-marked pottery vessels, recognized as diagnostic of the two traditions, points to a transitional position for the site (Adair and Brown 1981).

Additional support for an in-place transition from Plains Woodland to Plains Village is forthcoming from excavations at 14BU57 (M. Brown 1981). Unfortunately, structural remains were not discovered at this site, although the presence of burned daubing clay and a pit suggest some permanency to the occupation. Recovered ceramics could be classified to the Verdigris type, a diagnostic of the Plains Woodland tradition Greenwood phase (Reynolds 1979). That, however, the site is extremely late in the Woodland tradition is indicated by a radiocarbon date of

A.D. 1195±235, as well as the presence of triangular side-notched and unnotched arrow points (Plains Village tradition diagnostics). A kernel of Zea mays demonstrates that at least limited agriculture supplemented a subsistence still heavily reliant on natural products including deer, fish, probably birds, acorns, walnuts, and hickory nuts (M. Brown 1981).

The Nuttal site, 14BU4, was mentioned above in connection with the discussion of the Archaic period occupation of the El Dorado Lake area as it has a buried component assignable to the Chelsea phase (Artz 1981b). The site is also important for an understanding of Plains Woodland settlement systems of this locality. The evidence for Plains Woodland occupation of the Nuttal site is spatially-separated and to the south of the location of the Chelsea phase component, as well as restricted to surficial deposits, extending from the surface to a depth of 50 cm.

Evidence for permanancy for the Plains Woodland occupation was lacking. Rather, transitory and perhaps seasonally-occupied camps, along the crest of a natural levee were encountered. Abundant natural resources of a back swamp may have been the attraction for the apparently repeated use of this levee as a camp location. Analyses of the spatial distribution of artifacts demonstrate differentials interpretable in functional terms, including chipped stone manufacture, food preparation, and refuse disposal.

Although ceramic sherds were invariant in the presence of exterior cordmarking, variety was recognizable in temper types. Most of the sherds were tempered with indurated clay, although a few sherds with sand, limestone, and bone were present. Spatial differentials in the distribution of sherds of these varying temper types (Artz 1981b), as well as comparative studies, suggest changes through time in Plains Woodland ceramic technology may be responsible for the variety noted in temper. Earlier

Plains Woodland pottery is frequently stone tempered (Johnson and Johnson 1982:7). Bone is present in the pottery at the Two Deer site (14BU55) dated to A.D. 1000±25 (Adair and Brown 1981), while indurated clay is the norm for Pomona pottery of the Plains village tradition (Witty 1967). Studies of larger ceramic samples will be required to test these hypotheses (only 67 sherds were recovered from the excavations at the Nuttal site--Artz 1981b). Among the other tools recovered from the Plains Woodland component at Nuttal, projectile points (primarily of the Scallorn type--Bell 1960:84) and light-duty cutting tools predominate. Scraping tools are lacking from the assemblage, and heavy-duty chopping and/or butchering tools are rare.

Data forthcoming from the Nuttal site (14BU4) then, contribute significantly to an understanding of at least one settlement system of the Plains Woodland period in the El Dorado Lake area. Not only were Plains Woodland populations dwelling in small hamlets or villages of some permanency (Two Deer, 14BU57, Snyder), they were exploiting the natural environment from camps (perhaps seasonally) established at loci providing special attractions (e.g., a levee perhaps adjacent to a back swamp at the Nuttal site). In many respects, this pattern seems remarkably similar to the one previously described for the Late Archaic.

Although use of the Upper Walnut drainage system during the Plains Village tradition (A.D. 1000-1700) is documented (Fulmer 1977; Leaf 1979), it is not detailed as insufficient resources were available to conduct excavations in sites of this tradition during the post-1976 period of intensive archaeological field work at El Dorado Lake. Five components discovered as a result of the survey of the Lake can be assigned to the Plains Village tradition. That at least some date tc the pre-A.D. 1500

period is indicated by a radio-carbon date of A.D. 1210±75 (UGa-1374) from 14BU71 (Fulmer 1977:56), while the concentration of Lower Walnut focus (Great Bend aspect) sites about the junction of the Walnut and the Arkansas Rivers (Wedel 1956:344-78) suggests the likelihood that others date to post-A.D. 1500.

SPECIALIZED STUDIES

Chert, from Permian deposits which outcrop in the Flint Hills of Kansas, was used widely throughout the Central Plains for the production of chipped-stone artifacts. As El Dorado Lake is within the Flint Hills, attention has been devoted to the prehistoric utilization of the local chert resources, especially as this utilization affected settlement systems. A major study devoted to this topic will elaborate on the following summary (Haury, In Preparation):

> In the region of the upper Walnut River, which drains a portion of the southern Flint Hills three Permian formations provided major sources of raw materials. From west to east they are the Cresswell, Florence, and Wreford limestones. Of less importance but still used were the Foraker and Herington limestones. Procurement techniques were apparently adapted to the geographic situation of the bedrock source. These techniques included: (1) excavation of pits to extract chert from bedrock buried in the uplands, (2) removing chert from exposed bedrock ledges, and (3) expedient collection of chert from secondary deposits such as stream gravels or regoliths (Haury, In press).

HISTORIC SITES ARCHAEOLOGY

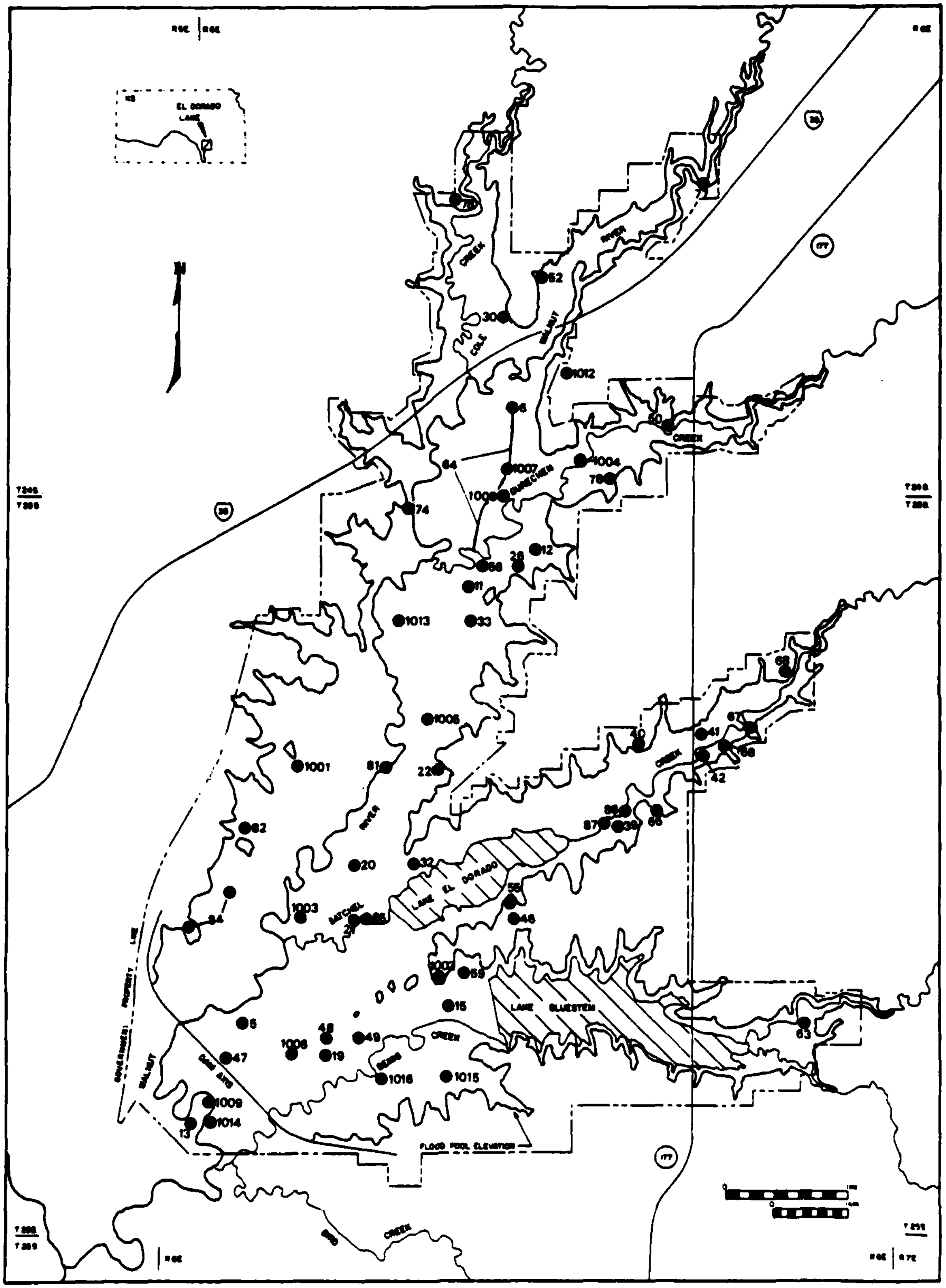
Although the 1976 "Archaeological Research Design and Salvage Mitigation Plan" for El Dorado Lake included recommendations for consideration of local historic sites (Leaf 1976:12-13; Dixon 1976:14-20), no provision was made for this important aspect in the Phase I contract for 1977. The 1977 survey, however, demonstrated, by calling attention to both quantity and significance, the importance of local historic sites, and as a conse-

quence major attention was devoted to developing an understanding of this period during all of the subsequent phases of work at the Lake (Roberts 1981a; 1981b; 1981c).

The Historic period at El Dorado Lake begins in 1857 with the arrival of the first Anglo-Americans, many of whom have descendants in the area today. Consequently, the most efficient means of developing an initial inventory of historic sites was a combination of personal interviews, studies of documentary sources, and pedestrian reconnaissance. These activities, carried out in 1978, resulted in the location of 66 Historic sites greater than 50 years of age (Figure 3.8). The 1978 survey for historic sites was conducted within the framework of research goals which guided all of the work at El Dorado Lake (see above): "...the intention was to recover data that would be useful in developing an understanding of the adaptions the settlers made to their environment, the economic networks that were operating, and the social system that existed" (Roberts 1981a:465).

Combining the results of studies of local oral and documentary history with data forthcoming from archaeological test excavations (Table 3.5), allows the recognition of a period of initial Anglo-American settlement, beginning in 1857, in the forested, fertile, bottomlands along the Walnut River. Perhaps attracted to this environment because of its similarity to "homelands" in forested eastern portions of North America, these early settlers of the El Dorado Lake area built log cabins and farmed the floodplains close to the river. Flooding of homesites soon made it obvious that adjustments would be necessary, and by the late 1860's shifts to higher ground were taking place. Concomittant with these shifts were changes in building materials, as later structures tend to be of wood-frame construction or of stone.

Figure 3.8. Map showing location of historic sites at El Dorado Lake (from Roberts 1981a, Fig. 10.1).


LAKE EL DORADO
LAKE BLUESTEM
FLOOD POOL ELEVATION
RIVER
CREEK
COLE
WALNUT
PROPERTY LINE
1012
1004
1007
1013
1006
1001
1003
1008
1016
1015
1009
1014
1002

Following solution of these early problems of settlement, mastery of agricultural pursuits, and population growth, establishment of a town, to serve as an economic hub and as a legal and political center by virtue of its designation as a county seat, became an important local goal. Although seemingly with growth potential as the county seat, Chelsea eventually declined with the growth of El Dorado, its rival to the south, to become one of more than 2,800 towns established in Kansas during the latter half of the 19th century which were soon to decline and disappear (Wilk 1981; Roberts 1981b).

Brief summaries of the results of test excavations in sites providing data for this overview follow. (Test excavations at sites listed in Table 3.5 but not summarized below were negative.)

14BU1002--FOSTER

The Foster site, 14BU1002, consisted of the remains of a homestead farm established in 1874 by Charles Foster, later to become a successful sheep raiser and breeder. Prior to the archaeological tests at the Foster site, all structures had been moved or razed. The test excavations disclosed that one of the buildings had originally been constructed as a wagon scale, and later converted into an ice house (Roberts 1981a).

14BU1005--DOC LEWELLEN SITE

Site 14BU1005 includes the remains of the farm homes and outbuildings of one of the earliest of the El Dorado area's Anglo-American pioneers, Doc Lewellen. Lewellen arrived in Butler County, Kansas in 1857 and initially constructed a log cabin on the floodplain west of the Walnut River. Subsequently, he constructed a stone cabin and barn on higher ground east of the Walnut, and finally, a wood frame house in the uplands. A successful farmer and stockman, Lewellen eventually owned in excess of 1160 acres

Table 3.5. Historic sites tested.

Site	Year Tested	Structure Tested	Reference
14BU1001	1978	Stone House	Roberts 1981a
14BU1002-Foster	1978	Ice House	Roberts 1981a
14BU1003-Marshall	1978	Log Cabin	Roberts 1981a
14BU1005-Doc Lewellen	1978,1980	Stone House	Roberts 1981a; 1981c
14BU1006-Kobel	1978	Barn	Roberts 1981a
14BU1007-New Chelsea	1978,1979 1980	Town	Roberts 1981a; 1981b;1981c
14BU1004-Osborn	1979	Log Cabin	K. Brown 1981
14BU1008-Donaldson	1979,1980	Stone House	K. Brown 1981 Roberts 1981c
14BU1009-Fort Bend	1979	Civil War Fort	K. Brown 1981
14BU1012-Old Chelsea	1979	Town	K. Brown 1981

(Roberts 1981a:505-9).

In 1978, test excavations were conducted in proximity to the stone cabin and in a nearby bank-barn. The cabin, of coursed masonry utilizing local limestone, was stylistically a vernacular I-house with gabeled ends. It measured 32 ft. 2 in. by 19 ft. 2 in., and probably originally had two rooms and a loft (Roberts 1981a:509-13). Tests, placed on the north and east sides of the cabin, disclosed a water-deposited silt build up, perhaps a result of periodic flooding, and a layer of cobbles apparently placed to compensate for the flooding (Roberts 1981a:516).

The barn, of Pennsylvania-German style, was constructed by cutting building stones from an outcrop, thereby producing a solid limestone floor and sufficient stone for foundation courses. The wooden superstructure was destroyed by fire around the turn of the century, and subsequently, many of the building stones were reused. Test units placed within the barn were non-productive, as after the fire the structure had been cleared for use for some new purpose (Roberts 1981a:516-19).

Additional test excavations in 1980, made in an attempt to locate the original floodplain dwelling, a log cabin, were unsuccessful. The cabin site may have been destroyed by natural erosion, or perhaps by the construction of a railroad (Roberts 1981c:117-121).

14BU1006--KOBEL SITE

Named for a son-in-law who was the owner until acquisition by the Corps of Engineers for El Dorado Lake, this site consisted of the farm homes and out-buildings of 1871 homesteader William Bailey. As a later arrival, Bailey was able to take advantage of the knowledge gained as a result of the unfortunate experiences of the earliest Anglo-American settlers with bottomland flooding. As a consequence, the Bailey homestead was placed

on the first permanent rise above the floodplain and away from the river from the first. The original farm home was a log cabin, replaced by a wood frame house constructed in 1915 (Roberts 1981a:532-43).

Another important building in the farm complex was a Pennsylvania-German bank barn, apparently constructed at or soon after the 1871 homestead date. The barn, measuring 36 ft. 1 in. east-to-west and 32 ft. 4 in. north-to-south, had a foundation of coursed blocks of local limestone and a wooden superstructure. Tests in the barn allowed recognition of original builder's trenches and produced a restricted range of artifacts perhaps characteristic of the specialized activities at a barn. Included are items of glass, pottery, and metal. Wire nails are most common indicating later additions and repairs to the original structure which was constructed with wooden pegs.

14BU1004--THE OSBORN LOG CABIN

Following local historical records (Roberts and Wilk 1981), the location of the Phineas Osborn log cabin was predicted to be on the floodplain of Durechen Creek, a major eastern tributary of the Walnut River. A surface collection, from within a gridded area established in the plowed field thought to contain the location of the cabin, was successful in more precisely defining its location by means of concentrations of historic artifacts dating to the proper period (the cabin was built around 1874--K. Brown 1981:8-35).

Next, a cross-shaped test trench was excavated in an attempt to establish the precise location of the cabin. That this step was less successful is probably a result of recent agricultural activities which have destroyed all traces of the foundation of the cabin. A concentration of gravel, perhaps associated with the construction of the cabin,

was the only possible indication of its exact position (K. Brown 1981: 8-35).

Artifacts from the Osborn cabin site indicate construction before the latter part of the 19th century when wire nails became abundant and abandonment before 1903 (on the basis of seam marks on two bottle fragments). Other artifacts suggest limited wealth for the occupants, Army service, the presence of children, and the production of dairy products, especially cheese (large quantities of earthenware and stoneware crockery vessel sherds--K. Brown 1981:8-35).

14BU1008--THE DONALDSON HOUSE

In 1979, tests were made about the location of a cut limestone house built in 1869 by George T. Donaldson, an individual of importance in the establishment of the nearby town of Chelsea. The Donaldson house was north facing, two stories in height, with rubble-fill walls of local limestone (K. Brown 1981:35-7).

Guided by infra-red photographs, excavation units were laid out over two rectangular areas north and east of the stone house. The goal was to recover artifacts indicative of past economic activities and the social status of previous residents. The excavations encountered two features, a hearth and a stone-supported post location, as well as quantities of historic material culture debris. Datable artifacts substantiated the historic record as to the building date for the Donaldson stone house, and indicated both greater wealth and social status for the early occupants than was the case at the Osborn log cabin site (K. Brown 1981:37-35).

In 1979, additional tests were conducted to the south of the Donaldson stone house in an attempt to locate the original home site occupation (a log cabin constructed in 1857). That the attempt was unsuccess-

ful is probably a combination of light occupation, subsequent development, and agricultural activity which obliterated all traces of the original cabin site (Roberts 1981c:122-35).

14BU1007--THE NEW CHELSEA SITE

In 1858, only a year after the initial Anglo-American settlement of El Dorado Lake area, a Chelsea Town Company was incorporated and given permission to purchase up to 320 acres of land in Butler County, Kansas and to survey it into blocks, lots, and squares. "Old" Chelsea was the first county seat of Butler County, and undoubtedly the loss of this political significance to El Dorado was contributory to the demise of this original town by 1867. "Old" Chelsea (14BU1012) is beyond the boundaries of the federal reserve at El Dorado Lake, and as a consequence, archaeological investigations were not made at this site, other than to verify its location (K. Brown 1981:6-8).

New Chelsea (14BU1007) was established in a different location in 1868 and lasted until 1878. As this location is within the boundaries of El Dorado Lake, in 1978, 1979, and 1980 excavations were conducted to recover data before its destruction by flooding and construction activities (Roberts 1981c:141-45).

In 1978, the tests were limited in extent and dug to assess the potential of the site for information on early town settlement in Kansas. Unfortunately, a portion of the site had already been destroyed by construction activities related to the relocation of a railroad. The tests produced historic artifacts in association with a cobble-lined walk and possible building foundations (Roberts 1981a:543-58).

Investigations in 1979 were multi-faceted including historical cartographic work to resolve inconsistencies in the town plat, aerial

photography to help define the location of features within the town, an assessment of the effect of recent agricultural activities on artifact displacement, and excavations in the town's blacksmith shop. Detailed study of the spatial distribution of artifacts within the shop allowed identification of the location of the forge, possibly an anvil, a general work area, and two possible specialized work areas, one for wagons and the other for farrier activities (Roberts 1981b).

Final investigations at New Chelsea, in 1980, consisted of an intensive surface collection designed to facilitate the identification of variations in activities within the town. Concentrations of artifacts reflective of domestic household activities, a store, and a carpenter's shop were encountered. The locations of certain of these activities within the town was probable as a result of study of historic documents. The archaeological record provided verification. Other activity areas were not documented historically, so the only indication came from the archaeological work (Roberts 1981c:141-83).

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APPENDIX I

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