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THE DOWNSTREAM STOCKTON STUDY:
THE CULTURAL RESOURCES SURVEY

(FINAL REPORT)

A PROJECT CONDUCTED FOR THE
UNITED STATES GOVERNMENT
U. S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

Under Purchase Order No. DACW41-76-M-1059

by

AMERICAN ARCHAEOLOGY DIVISION
DEPARTMENT OF ANTHROPOLOGY
UNIVERSITY OF MISSOURI-COLUMBIA

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March 15, 1977

Mr. Paul D. Barber
Department of the Army
Kansas City District
Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Mr. Barber:

Enclosed is the final report of the cultural resources survey of the Downstream Stockton Study Area, carried out under the terms and specifications of the U.S. Army Corps of Engineers purchase order number DACW41-76-M-1059.

In complying with the terms of this purchase order, we are submitting the original copy of the enclosed report, which summarizes the cultural resources in the Downstream Stockton Study Area.

The archeological data were compiled and summarized by Dr. Donna C. Roper, Archaeologist III, and the architectural history by Nanette Linderer (Research Investigator).

We are pleased to acknowledge the support provided by the Corps of Engineers in this research.

Sincerely,

WR Wood

W. Raymond Wood
Professor of Anthropology
Principal Investigator
Harry S. Truman Reservoir Project

WRW/js

THE DOWNSTREAM STOCKTON STUDY:
THE CULTURAL RESOURCES SURVEY

CONTENTS

List of Figures

List of Plates
(follow page 149)

List of Tables

THE DOWNSTREAM STOCKTON STUDY:
THE CULTURAL RESOURCES SURVEY

Part I

Archeological Resources

by

Donna C. Roper

A. Introduction

During the spring of 1976, an archeological survey crew from the University of Missouri conducted a survey for archeological sites in the Downstream Stockton Study area of the Sac River in Cedar County, Missouri. This work was carried out under the terms of Purchase Order DACW41-76-M-1059. The results of this survey are reported herein.

According to the Scope of Work for this project, the Contractor is to "evaluate all sites" and to "prepare a report of findings with emphasis on type and importance of each cultural resource". We have argued elsewhere (Roper and Wood 1975) that we believe the only way to properly evaluate sites and to be prepared to state their importance is to approach survey and analysis with a professionally responsible set of research goals and questions. Incorporating a relatively small survey, such as the Downstream Stockton survey within the framework of a larger survey in a geographically contiguous area (such as the

Harry S. Truman Reservoir, for which a structured research design has been formulated) is one way to ensure such an approach. Little modification of the Truman survey research design was necessary to accomodate the Downstream Stockton survey. Since the basics of that research design have already been stated in several documents submitted to the Corps of Engineers (Roper 1975, 1976:9; Roper and Wood 1975) we omit a lengthy discussion of this research design here, except for the statement of special conditions prevailing in this survey and the unique questions asked of the Downstream Stockton data.

Chief among the special circumstances is the fact that we are dealing entirely with a floodplain situation. A reservoir floods not only floodplains, but also terraces and portions of valley walls. When total acquisition lines are considered, a survey of fee simple lands in a reservoir such as Truman incorporates, at some point, nearly all topographic situations, including even the highest bluff tops. But a survey area such as that defined for the Downstream Stockton Study incorporates only part of the topographic diversity present along the Sac River. In our examination of prehistoric subsistence-settlement behavior in southwest Missouri we are concerned with how human communities interacted with their natural environment and how they distribute themselves and their activities across the landscape. The examination of a single environmental zone is therefore an interesting question. As will be shown in the next section of this report, the Sac River bottomland is potentially rich in natural biotic resources. However, we must at the outset divorce ourselves from the hope that an inspection of the bottomlands will inform us on the use of the bottomlands by prehistoric communities. It will not. We will see only half the picture. It is true that human communities tend to exploit the resources immediately surrounding the sites they inhabit. But it is also true that several zones are usually exploited from a single locus. Thus, bottomlands may be exploited from upland loci with no trace of such activity recorded in the bottomlands. Also, uplands may be exploited from low-lying loci and thus leave remains of this activity in the bottomlands. Therefore, what we see in the bottomlands is the remains of those activities carried out in the bottomlands and adjacent uplands, that leave physical and non-perishable remains in the bottomlands.

Further, we have to account for various non-cultural processes that serve to distort the archeological record. Such processes are particularly acute in bottomlands where flooding can alternately scour a site, expose it, wash it away, or deposit silt and bury it (see Christenson et al. 1975:18-21 for a discussion of some geologic processes serving to confuse the archeological record in the bottomlands).

In spite of the above limitations, a floodplain survey can still ask significant questions within the framework of a larger regionally-oriented subsistence-settlement investigation. A human settlement system will be composed of a series of functionally interrelated settlements of a single human community. Archeologically, we will see this manifested as a series of sites with varying artifact assemblages, variation being expressed both in terms of presence and absence of various artifact classes, and quantitatively in terms of varying proportions of those classes of artifacts present. Under the model we are using to structure our research, we would expect these various types of sites to be located in different types of places according to the season, (as well as the purpose) for which they were established.

With this model in mind in the Downstream Stockton survey (limited as it is to the bottomlands of a major stream in the Western Prairies region of Missouri), we have chosen to ask the following questions:

1. What types of sites were located in the bottomlands and what kinds of places were chosen for these sites?

2. Is the full known cultural sequence of the region represented in the bottoms? If not, are we seeing gaps

in the occupation of the Sac River in general, or merely a lack of habitation in the bottomlands?

3. Does the floodplain representation of site types change over time? That is, do we see, for example, seasonal hunting camps represented at one time, but only quarrying stations at another?

4. If so, what is the nature of the change?

The analysis of the survey data will thus follow two lines of inquiry, complementary to one another, aimed not only at answering these questions using several lines of evidence, but also theoretical questions about human settlement behavior.

One line of evidence will be a study of the artifact assemblages from the sites. These will be examined from both a chronological and functional viewpoint. We will argue the importance of the former in a later section of this report; the latter is an obvious constituent of analysis aimed at answering the above questions. This too will be argued in greater detail at the appropriate time.

The second line of evidence will be the locations of the sites themselves. In all of our surveys in the Truman Reservoir and vicinity, we are approaching our work with (among others) a set of questions directed toward settlement behavior. Some of these questions have been very explicitly stated in previous documents (e.g. Roper 1975:5) and follow from a series of general propositions concerning how human communities interact with their natural environment and how they disperse themselves to effect this interaction. It has been shown elsewhere that an analysis of site locations using techniques following from the model are an efficient means of answering research questions on a specific level, and can contribute to a general understanding of exploitation processes (Roper 1974,1975). These analytic techniques will also be discussed in more detail at an appropriate place in this report.

B. Environment

1. General Description

The area of study in this report is mapped on the U.S.G.S. Stockton, Bearcreek, and Caplinger Mills quadrangles (7.5' series). It is bounded on the south by the Stockton Dam, on the north by Caplinger Mills, on Bear Creek by Owens Mill, and on the east and west by the valley walls (Figure 1). A total of approximately 20 km^2 (7.8 mi^2), which includes 26.5 km (16.5 mi) of the Sac River and 1.75 km (1.1 mi) of Bear Creek is under consideration. This area lies entirely within Cedar County, Missouri.

The Sac River follows a south-to-north course entrenched into the Springfield Plateau subdivision of the general Ozark province in southwestern Missouri (Bretz 1965:11-12).

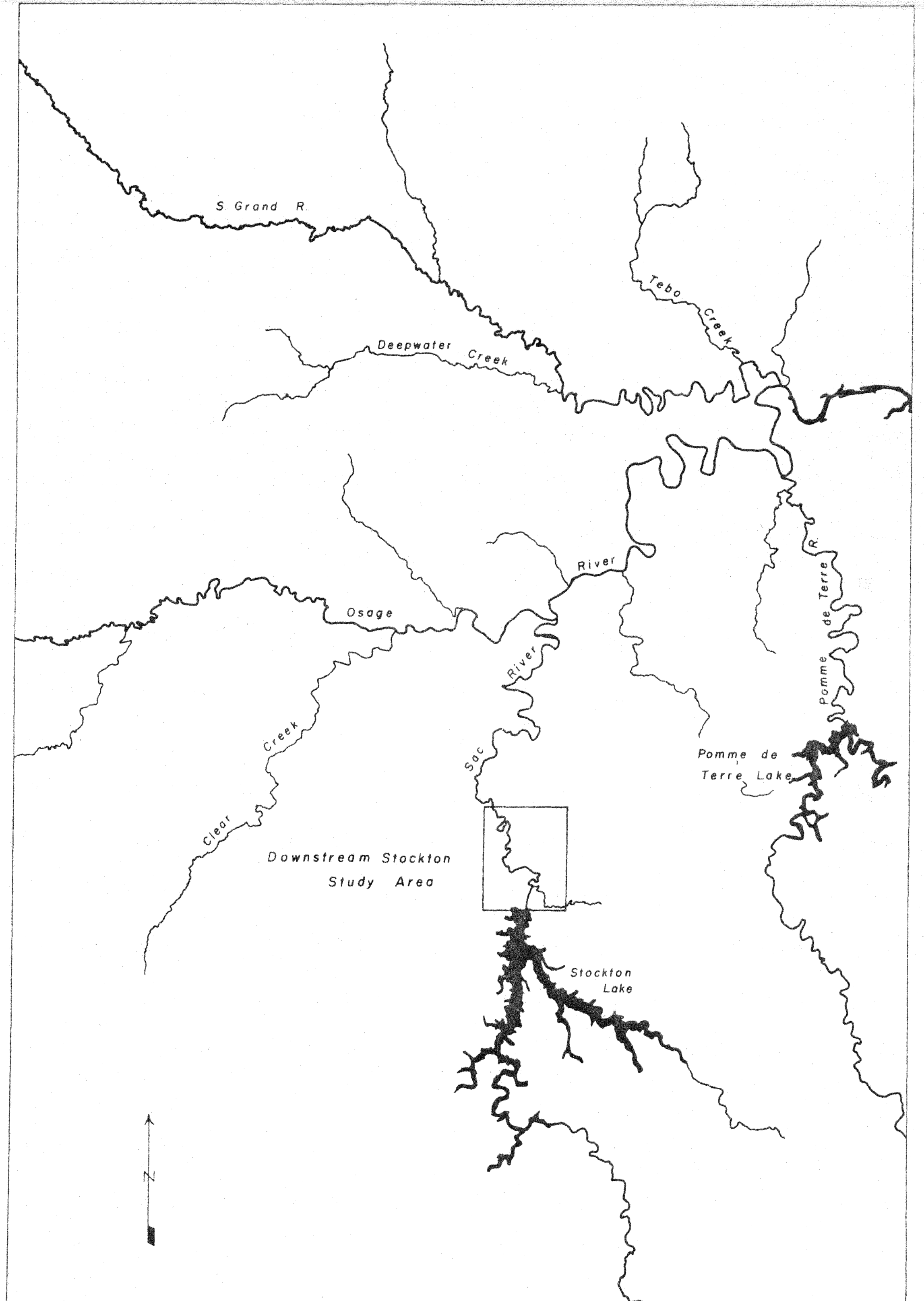

Figure 1. Vicinity Map — Downstream Stockton Study Area

This area is characterized by broader river valleys and less deeply entrenched streams than in the Salem Plateau (or Ozarks proper) immediately to the east (Branson 1944:355). The two plateaus (Springfield and Salem) meet at the Eureka Springs escarpment just east of the study area. This contact is marked by a transition from the primarily Mississippian age bedrock in the Springfield Plateau to the Ordovician age bedrock with scattered monadnocks of Mississippian age in the Salem Plateau (Bretz 1965:13).

Baker's (1962) geologic map of the Stockton Quadrangle therefore shows the portion of the Sac River valley on that quadrangle bordered by a mosaic of the local geologic formations. The Ordovician age Jefferson City - Cotter Formation outcrops immediately below Stockton Dam on both sides of the river. Within less than a mile, however, it disappears, dipping below Mississippian age formations. The Chouteau and Burlington limestones form the valley walls along the rest of the valley in the Stockton Quadrangle and form the bedrock of the uplands. Faulting leads to some discontinuities, so that a small exposure of the Pennsylvanian age Warner formation sandstone occurs at one point. A Tertiary age gravel deposit is mapped near one river meander. All formations except the Warner contain cherts of suitable quality and size for the manufacture of chipped stone tools.

The dominant geologic formation on the valley floor is Quaternary alluvium. Baker (1962:70) observed some poorly preserved terraces "probably of Pleistocene age" only in the vicinity of the dam.

A general soil map of Cedar County, now out of print, was published by Watson and Williams in 1911 and has not yet been superceded by more recent work. We would like to thank Mr. John Hubbard, extension agent in Stockton, Missouri, for making a copy of this report available to us.

Watson and Williams (1911) map the dominant soil of the Sac River bottoms as Osage Silty Clay Loam, a soil of recent alluvial origin, derived from reworked material from the uplands. Native vegetation on this soil was a heavy growth of walnut, hickory, elm, and pawpaw (Watson and Williams 1911:30).

Climatic figures for Cedar County were not specifically available, but the figures reported by Watson and Williams (1911:6) for Lamar, in adjacent Barton County, were felt by Hubbard (personal communication) to be reasonably reliable. Average annual temperature and precipitation values are graphed in Figure 2 based on tables given by Watson and Williams (1911:6). It should be noted that precipitation is not evenly distributed through the year, much of it falling between May and September. Borchert (1950) has shown that

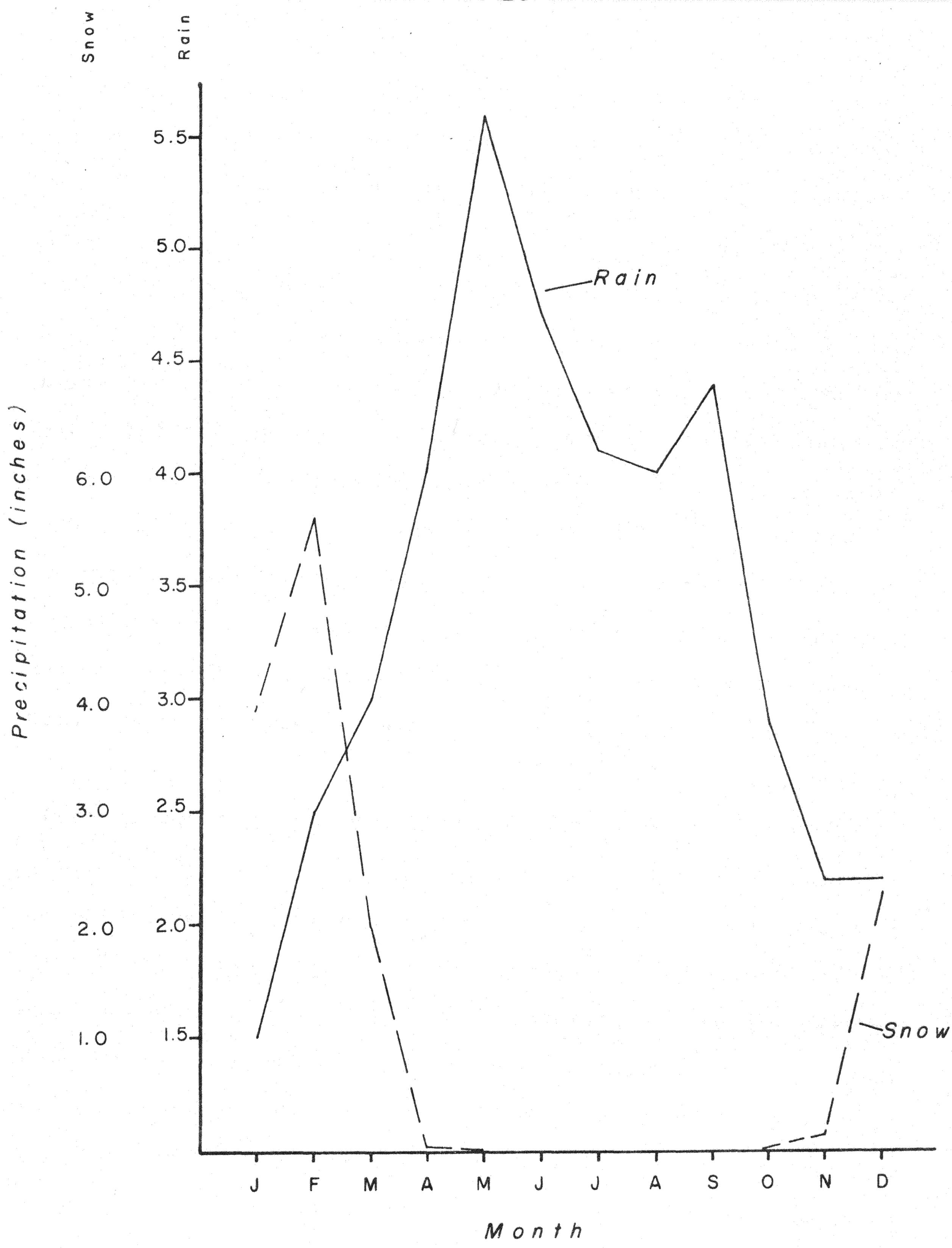

Figure 2a. Precipitation Distribution – By Month

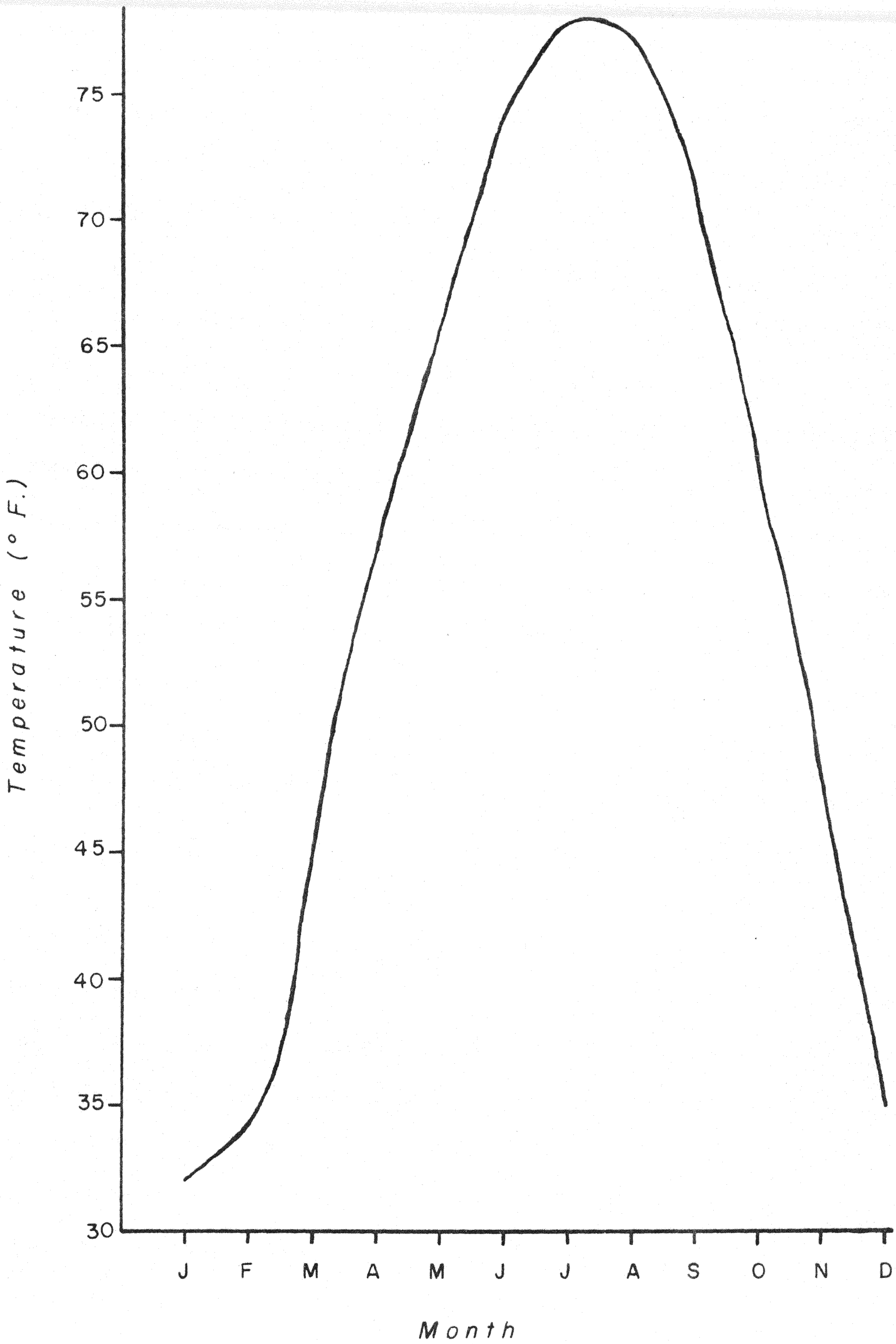

Figure 2b. Temperature Distribution — By Month

this type of preciptitation distribution is characteristic of the mid-continent grassland of North America.

Floristically, the Sac River valley is at the eastern edge of the mid-continent grassland. The mapping of vegetation from the records of the Federal Land Surveys being done for the Truman Reservoir does not include Cedar County. Extrapolating from general distributions of forest and prairie in St. Clair County, immediately to the north, however, and using general descriptions of the area should provide reasonably accurate generalizations. In general, flat to gently rolling uplands , before Euro-American agricultural disturbance, were covered by a tall-grass prairie generally dominated by bluestems. The river valleys and valley walls were covered with an oak-hickory forest.

2. Economic Potential.

In order to realistically assess prehistoric use of the river bottoms, it will be helpful to review the economic potential of this zone. F. King (1976:249-260) has listed potential food plants, along with the part or parts used, habitat, and season, for the Western Missouri Ozarks. Assuming that this list is as valid for the Sac River Valley as for the Pomme de Terre Valley just to the east (F. King, personal communication), a seasonal model of food plant availibility in the river bottoms is presented in bar graph

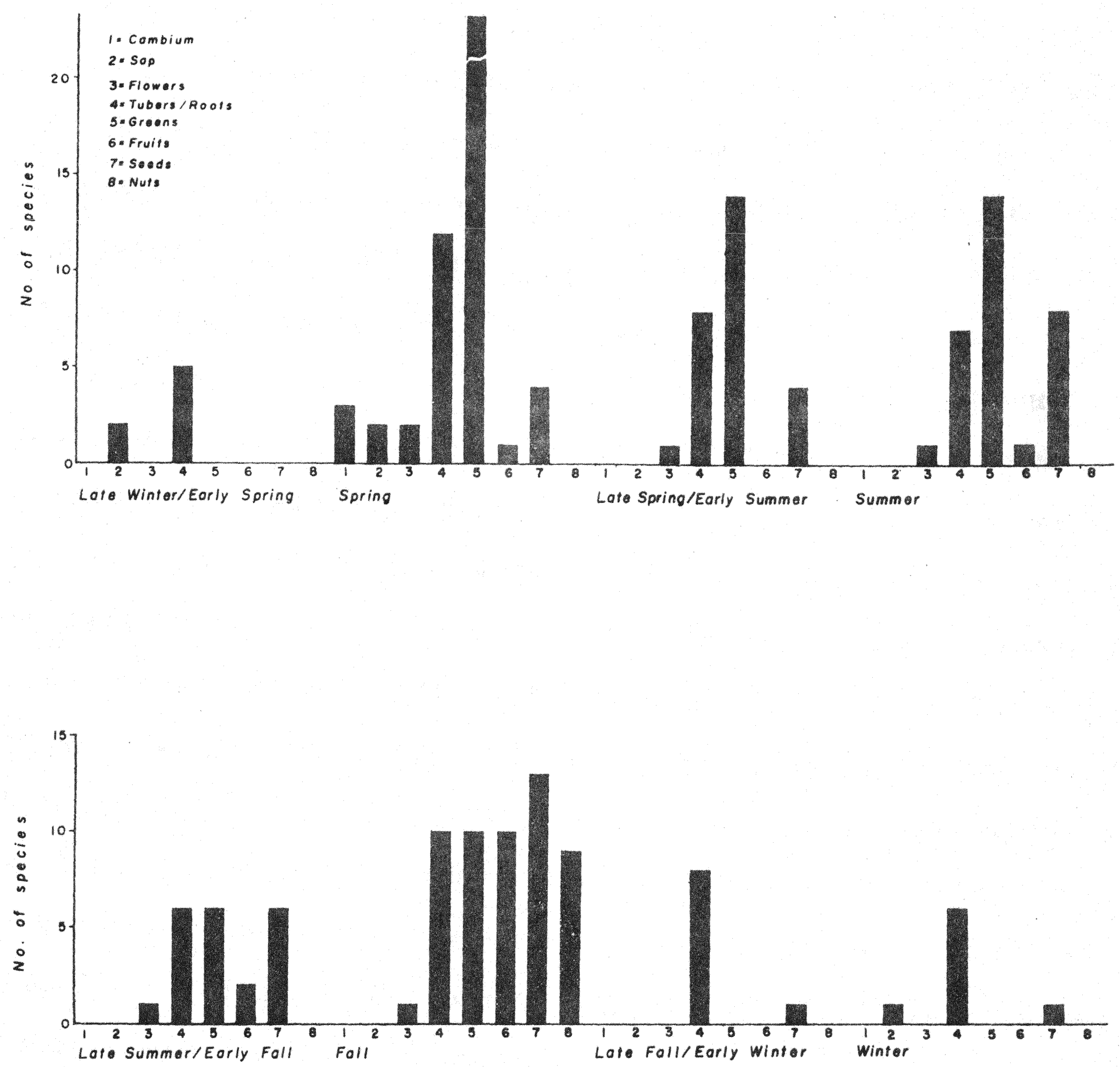

Figure 3. Seasonal Availibility of Plant Foods in the Sac River Bottoms

form (Figure 3). Note that counts are given as numbers of species, with no attempt to control for the relative food value of different categories. Certainly, however,the potential contribution of nuts and acorns as opposed to flowers , for example, is not of equal magnitude. Seasonal availability does, however, frequently dictate the use of less desirable foods, or foods with lower potential nutritional value (see, e.g., Flannery 1968 or Lee 1968:35). Thus, assessing the diversity of all potential plant foods is important.

The fauna of a region is of a less seasonal nature, but is not evenly distributed. Although animals are mobile, most species show distinct preferences for one or two vegetation zones, and some are known to have very limited home ranges within these zones. Surely, these facts would have been known to the prehistoric hunter, who would react accordingly. Figure 4 thus depicts habitat preferences, and also indicates how many species do not show even a secondary preference for bottomland. As with plant foods, there is a large disparity in potential. For example, it takes a great number of rodents to yield as much meat as one deer. Food preferences are also exhibited in reference to animals. Bats (<u>Chiroptera</u>) are abundant in terms of number of species. But, bat bones are indeed rare in the archeological record, being generally confined to caves or shelters where their

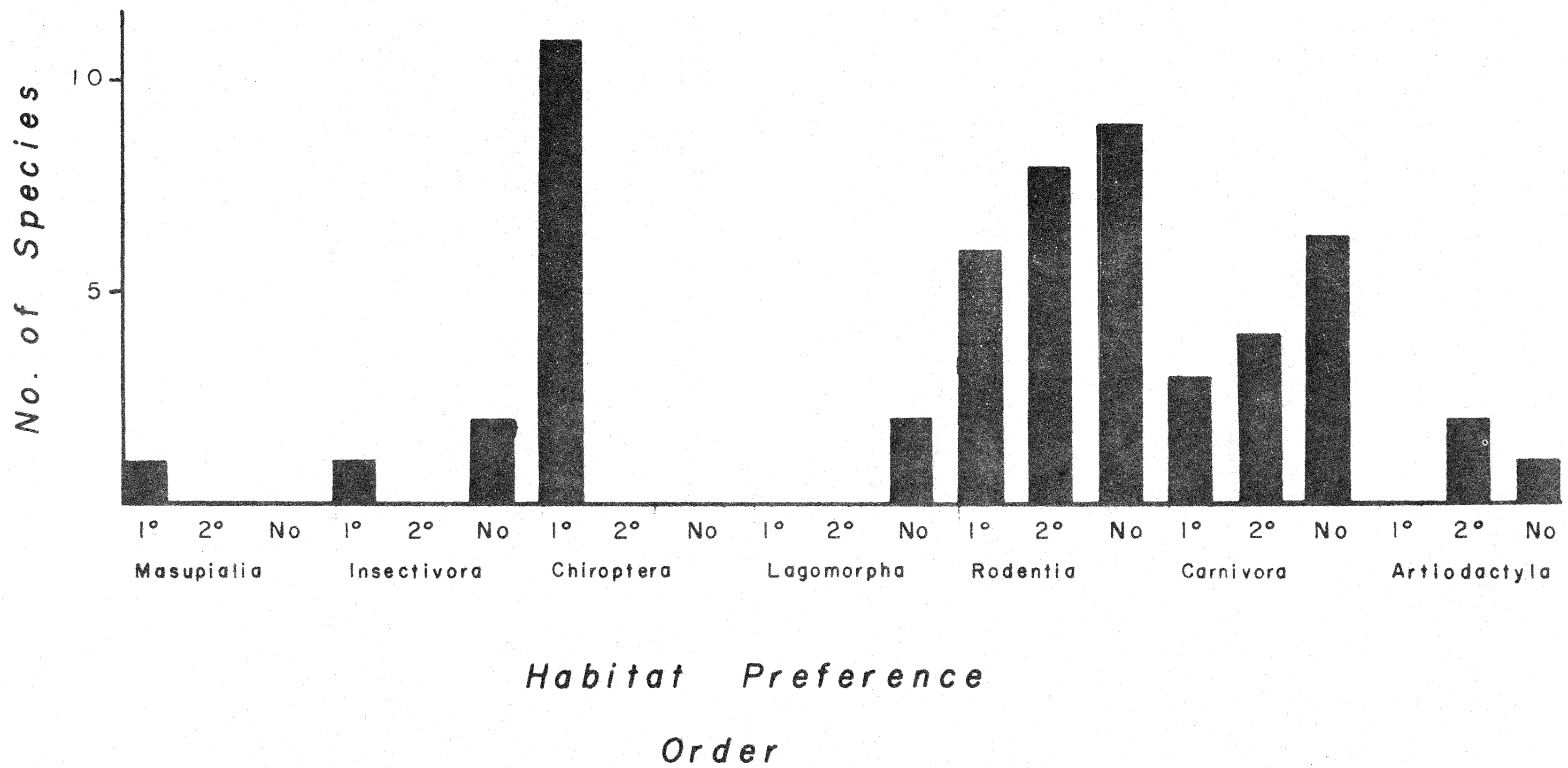

Figure 4. Habitat Preferences, by Order, of Mammals
1° = Primary habitat in bottoms, 2° = Secondary habitat in bottoms, No = Bottoms not used

inclusion in the deposits may be entirely fortuitous and not at all the result of intentional exploitation. Further, seasonal adjustment of species distribution does occur. Thus, although the white-tail deer has a secondary preference for bottomlands, depending on mast and season, they may well be found having their highest densities in the bottoms (Smith 1974:34).

In addition to mammals, McMillan (1976:38-41) lists 22 species of amphibians and 19 species of reptiles (exclusive of snakes) native to the area. Many of these species, especially the turtles, are aquatic or at least are bottomland dwellers. Ninety-eight species of fish and 25 species of mussels are of course aquatic and could be expected in the river itself. A large number of birds are present but the economically most important species, turkey and prairie chicken, are not bottomland dwellers. Ducks and geese, however, would have been available in the bottoms in quantity.

Finally, an assessment of the economic potential of a bottomland area and of its suitability for habitation must include some appraisal of flood threat. Figure 5 plots the monthly distribution of the annual flooding on the Sac River near Stockton for 1922-1965 (data from Sandhaus and Skelton 1968:127-128), prior to regulation by the Stockton Dam. It is readily apparent that, as one would expect, the

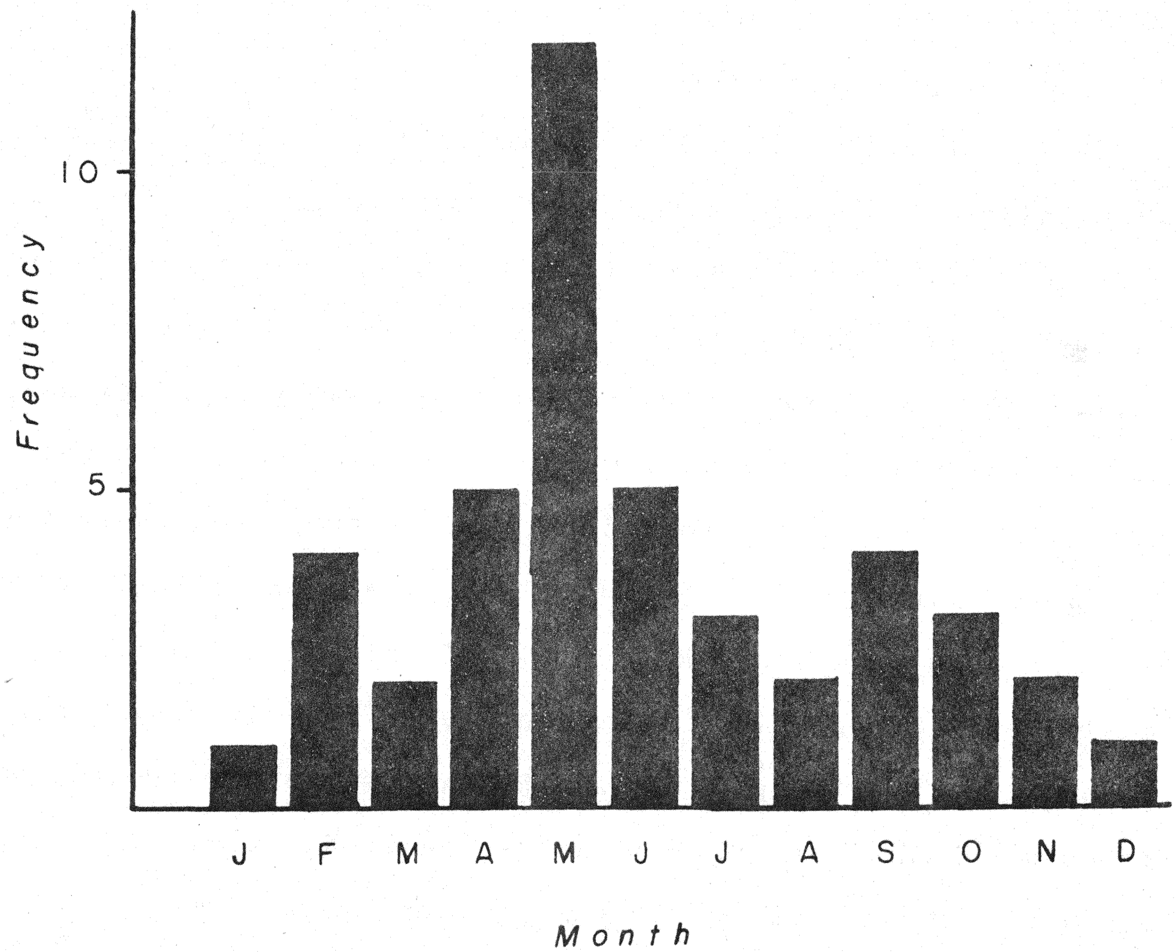

Figure 5. Monthly Distribution of the Annual Flood, Sac River near Stockton, 1922 - 1965

distribution of flood probabilities is similar to that of rainfall (Figure 2a), the probability of the annual flood occurrence being highest during the spring months.

C. Previous Research and an Archeological Framework for the Lower Sac River Valley

An archeological survey was conducted in 1961, prior to inundation of Stockton Lake, and archeological survey is currently being conducted in the Harry S. Truman Reservoir, including that portion on the extreme lower Sac River. That part of the Sac River between these two reservoirs, however, received sparse investigation prior to the present survey. Only 10 sites were recorded in the survey area, data for which are summarized in Table 1. All are open sites, none of which has received subsequent professional attention, nor has material from any of them been described in any known report or manuscript. Several other sites are located on adjacent bluffs but are high above the study area.

None of the material from previously recorded sites in the Downstream Stockton portion of the Sac River was available for restudy. Deriving any sort of cultural-historical or environmental-cultural framework on the basis of previous work in the study area itself is therefore impossible. Results of surveys and excavations in the Stockton and Truman reservoirs are, however, available and

Table 1

Summary of Previous Surveys
Downstream Stockton

Site Number	Date of Record	Recorder
23CE14	n.d.*	C. Collins
23CE15	n.d.	C. Collins
23CE16	n.d.	C. Collins
23CE17	n.d.	C. Collins
23CE42	n.d.	H. F. Mann
23CE51	10/62	H. F. Mann
23CE52	4/62	H. F. Mann
23CE131	3/61	R. Pangborn
23CE156	12/65	R. Pangborn
23CE215	9/62	P. T. Brophy

*n.d.- No date given in Archaeological Survey of of Missouri records.

may be applied with a high degree of confidence. The general archeological framework used for Missouri and the Midwest in general can also be used at a gross organizational level.

Archeologists have traditionally used a quadripartite division of time and speak of Paleo-Indian, Archaic (subdivided into Early, Middle, and Late), Woodland, and Mississippian periods preceeding the historic Indian and Euro-American occupation of eastern North America. Chapman (1975:25-30) has reiterated this sequence for Missouri in general. Although, as discussed in section A, our major goal goes beyond the cultural - historical to prehistoric behavior as reflected in the archeology of the bottomlands, we are concerned to some extent with culture - history, for two reasons: 1) other investigators may wish to know what kinds of material were found in the Sac River bottoms; 2) there is an unfortunate tendency among some archeologists to feel that the temporal dimension can be ignored when interest is focused on behavioral questions. We do not agree. Sequences of points or pottery may not be the best temporal yardstick available, but at least they do provide a gross framework for examination of change. We agree with some that study of change and adaptation requires more and better, not less, chronological control. Accordingly, a brief summary of the cultural - historical sequence for southwest Missouri is presented - emphasizing the identifying features of each period.

Paleo-Indian and Dalton

The primary identifying characteristic of the Paleo-Indian period is the fluted lanceolate point, such as Clovis. Such points are, however, rare on the surface of sites in the Sac River vicinity. Only a single non-provenienced Clovis point is reported from Cedar County (Smail 1951; Chapman 1975).

Dalton is identified by the presence of the Dalton point, a fluted lanceolate form, distinguished from Clovis by its deeply concave base, frequently serrated lateral margins, the "eared" appearance of its base, and heavy grinding on all edges of the haft element. While Dalton remains are abundant in the Mississippi alluvial valley in Missouri and Arkansas (e.g., Redfield 1971, Goodyear 1974, Schiffer and House 1975, Price and Krakkar 1975). Only a single Dalton point has been reported in the Western Prairie Region of Missouri. Chapman (1975:99) has noted that "It would appear that there was very little if any use of the Upper Osage Locality by Hunter-Foragers of the Dalton period." Dalton remains are identified, however, immediately to the east at Rodgers Shelter (McMillan 1976:223), and several as yet unreported Dalton points have been found during the survey of the Truman Reservoir.

Undoubtedly much more evidence of Dalton occupations in southwest Missouri (and Paleo-Indian too, for that matter), lie buried in Holocene terraces in the Osage River basin.

Archaic

Chapman (1975:127-128) considers a variety of point forms to represent the Early Archaic period. These include Rice Lanceolate, Rice Contracting Stemmed, Rice Lobed, and Hidden Valley Stemmed. These types are found at Rodgers Shelter, where they are considered Middle Archaic (Chapman 1975:133). No direct evidence of Early Archaic is recognized yet in the Sac River area.

The Middle Archaic period is characterized by an increased climatic drying with attendant greater openness of the surrounding forests (McMillan 1976:227). At Rodgers Shelter, a concomitant increasing subsistence stress is apparent, leading to an eventual abandonment of the shelter (McMillan 1976:225). In general, points characteristic of this period are large side-notched forms variously known as Raddatz or Big Sandy Notched (Chapman 1975:158), among other terms. The Jakie Stemmed point, (a stemmed to corner-notched form with a flared base), is also common during the Middle Archaic. A number of specimens of both these types were collected from the surface of sites in the Stockton Reservoir (Powell 1962:15-17); excavated in stratigraphic context in several rockshelters in St. Clair County in the

Truman Reservoir (Chapman 1975:172); and occur in recent University of Missouri surface collections from several sites near the confluence of the Sac and Osage rivers, in Truman reservoir.

In the Late Archaic period, the climate cooled somewhat, and more heavily forested conditions returned to the area of Rodgers Shelter. By this time, a large variety of point styles are common. Major point types found in the prairie area of southwest Missouri include the Smith, Afton, Table Rock, and "Stone Square Stemmed". All of these types, plus several less common ones, occur with greater frequency in shelters excavated in Stockton and Truman Reservoirs (McMillan 1966; Chapman 1975) as well as in recent University of Missouri surface collections in Truman Reservoir. Their occurrence in the Downstream Stockton portion of the Sac River valley would therefore be expected.

Woodland

The major difference between the Woodland stage and the preceeding Late Archaic period is the addition of pottery to the material culture inventory. The adoption of horticulture and the construction of burial mounds are other frequently mentioned characteristics of the Woodland stage (Willey 1966:267; Jennings 1968:191), although neither of these are strictly restricted to Woodland.

Recognizable Early Woodland is essentially unknown in the western Ozark border region of Missouri. King and McMillan's (1975) identification of a storage pit at Boney Spring, Benton County, as Woodland is based essentially on an equation of radiocarbon dates with the dating of Early Woodland elsewhere in Midwestern United States.

Elsewhere in the Midwest, the Middle Woodland period is equated with Hopewell which, among other things, is represented by a series of distinct (often dentate stamped) ceramic types and by several recongizable point forms, most notably the Snyders point. A number of local variants on basic Hopewell ceramic styles have been defined - including material from northeast Oklahoma (Baerreis 1953), southeast Kansas (Marshall 1972), and the Kansas City area of Missouri and adjacent Kansas (Kay 1975; Johnson and Johnson 1975). Little of this material is found in the western Ozarks and Sac River area, although Mack (1942:19) reported small amounts on sites in the Western Prairies. Wood (1961:102) associates one of the components at Blackwell Cave in the Pomme de Terre Valley with Hopewell. A few "Hopewellian" sherds were recovered from the Tater Hole and Griffin shelters in the Stockton Reservoir (McMillan 1966:182) and from several shelters in St. Clair county along tributaries of the Sac and Osage Rivers in Truman Reservoir. Points reminiscent of styles related to these Hopewell-like occupations of southwest Missouri are found in surface collections from sites in the Truman Reservoir. In general, however, such material is rare.

Evidence for Late Woodland occupation of the western Ozarks and eastern Plains is, however, abundant. Limestone- and clay- tempered ceramics, and a series of projectile points, including Langtry, Gary, Rice Side-Notched, and Scallorn and related small points are identifying characteristics of Late Woodland occupation. Ceramics include a heavily limestone-tempered type, highly characteristic of the Ozarks (e.g., Wood 1961; McMillan 1965), and a clay- or grog-tempered cordmarked form, identified as relating to the Pomona Focus of the Central Plains Tradition (Witty 1967). Late Woodland material is ubiquitous throughout both the Stockton (Powell 1962, McMillan 1966, Kaplan, et al. 1967, Calabrese, et al. 1968) and Truman Reservoirs.

During the Woodland period, mound building also occurred in the western Ozarks. Wood has discussed the Fristoe Burial Complex - a mound manifestation characterized by circular rock or rock-and-earth mounds containing multiple burials of several types with a wide variety of types of grave goods. Although it appears to be related to Woodland manifestations in the area, Wood (1967:105) has hesitated to more specifically assign the Fristoe Burial Complex within

Woodland because of the rather ambiguous nature of the remains. Mounds of the Fristoe and related burial complexes are scattered throughout the Sac River valley. Since they are normally placed high on the bluffs (Wood 1967:109), it would be reasonable to expect mounds on the bluffs bordering the Downstream Stockton survey area, but not in the survey area itself.

Mississippian

The Mississippian period begins later than the Late Woodland period, but is in part contemporary with the latter part of it. It is, however, distinguished from Late Woodland manifestations by the presence of shell-tempered pottery, and the presence of small triangular unnotched or side-notched points. Steed-Kisker pottery, the Kansas City area variant of Mississippian (Wedel 1943) is represented, albeit sparsely, in the vicinity of the Downstream Stockton survey area. Vista Shelter (Wood 1961,1968) was interpreted as a Steed-Kisker hunting camp, while site 23VE6 (Wood and Pangborn 1971:19) contained similar material. Small amounts of shell-tempered pottery - possibly Steed-Kisker - are present in several shelters in Truman Reservoir. Triangular points, both notched and unnotched, are also present.

Caddoan is a temporal equivalent of Mississippian in eastern Oklahoma and western Arkansas. Small amounts of

Caddoan material were found in the Stockton Reservoir. A Spiro Engraved water bottle was found in the Eureka Mound (Wood and Pangborn 1965) in the Sac River drainage, while several Caddoan sherds were recovered at the Sand Bluff shelters, also in Stockton Reservoir (McMillan 1966:184). It is, however, always a minor constituent of the assemblages in which it occurs and is only recognizable by the pottery. We would, therefore, not expect to identify any Caddoan material in the Downstream Stockton survey.

D. Survey Procedures

Inasmuch as the archeological survey of the Downstream Stockton area was carried out as a part of the Harry S. Truman Reservoir survey, procedures normally used in the Truman survey were employed. The major exception to this is that while the large size of the reservoir and shortness of time are forcing us to sample that area, every attempt was made to cover 100% of the Downstream Stockton area. Field techniques, record-keeping, etc. are otherwise identical.

The fieldwork was carried out by a 3-person crew, comprised of Mr. Jeffrey Quilter, crew chief, and Mr. James Donohue and Mr. Andris Danielsons, occasionally accompanied by the author or members of other survey crews. In the field, standard procedure is to line up at intervals of about 20 m and walk back and forth across the area to be surveyed, looking for artifacts, debris, or any other remains or possible remains of prehistoric human activity. Upon finding such remains, intervals are narrowed and a surface collection is made. All materials are placed in a paper sack labelled with a field site number (composed of the survey leader's initials, the date and the sequence number for the day -- thus, 23CE236 was originally field numbered JQ-4676-3, meaning the 3rd site recorded by Jeffrey Quilter's team on April 6, 1976). Dimensions of the observed area of scatter (AOS) are determined by either pacing or estimation -- preferably the former -- and a sketch map and survey form are completed for the site. A photograph, normally in black and white, is taken. The sites are plotted on the U.S.G.S. 7.5' topographic maps carried in the field by the surveyors.

In those areas where ground cover is heavy and adequate visibility was not present, we have employed shovel testing to help us "see" the surface. Shovel testing consists essentially of digging a small hole, about the width of a shovel blade, at some specified interval along a series of transects across a field. Although this is perhaps not the most efficient technique for combating the ground cover problem, it was the general consensus of archeologists attending the Second Annual Conference on Surveying Woodland Environments, held in Wausau, Wisconsin on February 27-28, 1976 (and participated in by the author), that shovel testing is the best economical technique currently available. Shovel testing, when necessary, was carried out only after permission to do so had been obtained from the landowner. Site 23CE258 was delineated almost solely by shovel testing.

Portions of the survey area proved to be rather difficult to reach by pedestrian survey. Therefore, the stretch of river included in this survey was floated in a canoe in early June to get to these areas, as well as to check river banks for sites eroding out of the bank.

In the laboratory, the site is assigned a permanent Archaeological Survey of Missouri (ASM) number. The ASM uses the Smithsonian Institution trinomial numbering system -- thus 23CE236 would be the 236th site recorded in Cedar County, Missouri, (Missouri being the 23rd state in alphabetical order of the 48 states of the United States at the time the system was devised, CE the abbreviation for Cedar County, and 236 being a sequence number within a county). The material in the surface collection is washed, numbered, and cataloged. Analysis techniques beyond this will be described with the artifact analysis.

Archeological research is an observational or non-experimental form of research. As such, strict control over conditions of observation is not possible; rather, it becomes necessary to record the conditions under which observations are made:

> ...we attempt to discount error which cannot be prevented or cancelled out, by measuring its direction and amount and subsequently making the corresponding correction of the data (Kaplan 1964:156).

For present purposes, we have felt it relevant to record information on the following variables concerned with survey conditions: surveyor, per cent of ground cover, nature of ground cover (field, woods, etc.), rainfall since the ground was last worked, the month surveyed (especially useful in the fields that exhibit much seasonal variability), and whether or not shovel testing was employed. A brief quality control evaluation of the Downstream Stockton Survey will be presented with the other survey results.

Let us emphasize at the outset that although we attempted a 100% survey of the Downstream Stockton area, we of course, did not achieve it. Three factors prevented us from examining certain parcels of land: 1) denial of permission to survey private land; 2) land unsurveyable due to a high percentage of ground cover - permission to survey was granted but permission to shovel test was denied, thus walking was unreliable; 3) repeated attempts to find land owner were unsuccessful (frequently due to absentee landownership).

Further, by the very definition of the limits of this survey, we were surveying with low-lying land subject to rather frequent flooding. We should therefore be very cautious of an interpretation of the lack of sites in an area. In many places the terrain we examined is almost certainly altered by flooding and we are quite certain that silting has occurred. We emphasize that our survey was a surface survey - even shovel testing is primarily a technique for seeing the surface (at least as we have used it). We have not expended large amounts of effort in search for buried sites. We feel this is unnecessary at present, for unless such a site is eroding out of the river bank flooding is not having an adverse effect on the site. The fact that one site, 23CE261, was found eroding out of the bank should be an indication that sites are indeed buried in the alluvial deposits along the Sac River.

E. Results

1. The Sites

The spring 1976 survey of the Downstream Stockton portion of the Sac River valley covered a total of $9 km^2$ (3.5 mi^2) or 45% of the area between valley walls. However, most of the land below the 776 foot contour line was walked. Nevertheless, the surveyed area includes a wide variety of topographic situations within the floodplain and should serve to give a reasonably reliable approximation of floodplain use as reflected on the floodplain itself.

The survey documented 44 sites (Figure 6) within this 9 km^2 area. Four of these were previously recorded in the files of the Archaeological Survey of Missouri (ASM); the other 40 are newly assigned numbers. We must note, however, that a number of the previously recorded sites (Table 1) could not be plotted on our field maps due to ambiguities in the locations given and as mapped in the ASM records. We almost certainly relocated a number of these; however, in a number of instances several of our sites would equally well fit the legal description and sketch available. In such cases, where it was impossible to determine what the previously recorded site might have been, we have, in effect, voided the old site number and assigned new numbers to more precise loci. Rather than give individual descriptions of each site, relevant descriptive attributes concerning environment, site characteristics, and survey collections will be presented later.

Part D (above) briefly discussed the desirability of recording and evaluating data on survey conditions, and listed the variables coded for each site recorded. Most of these data are given in Table 2.

Two factors assisting in this survey were that: 1) much of the land is normally under cultivation, and 2) the survey

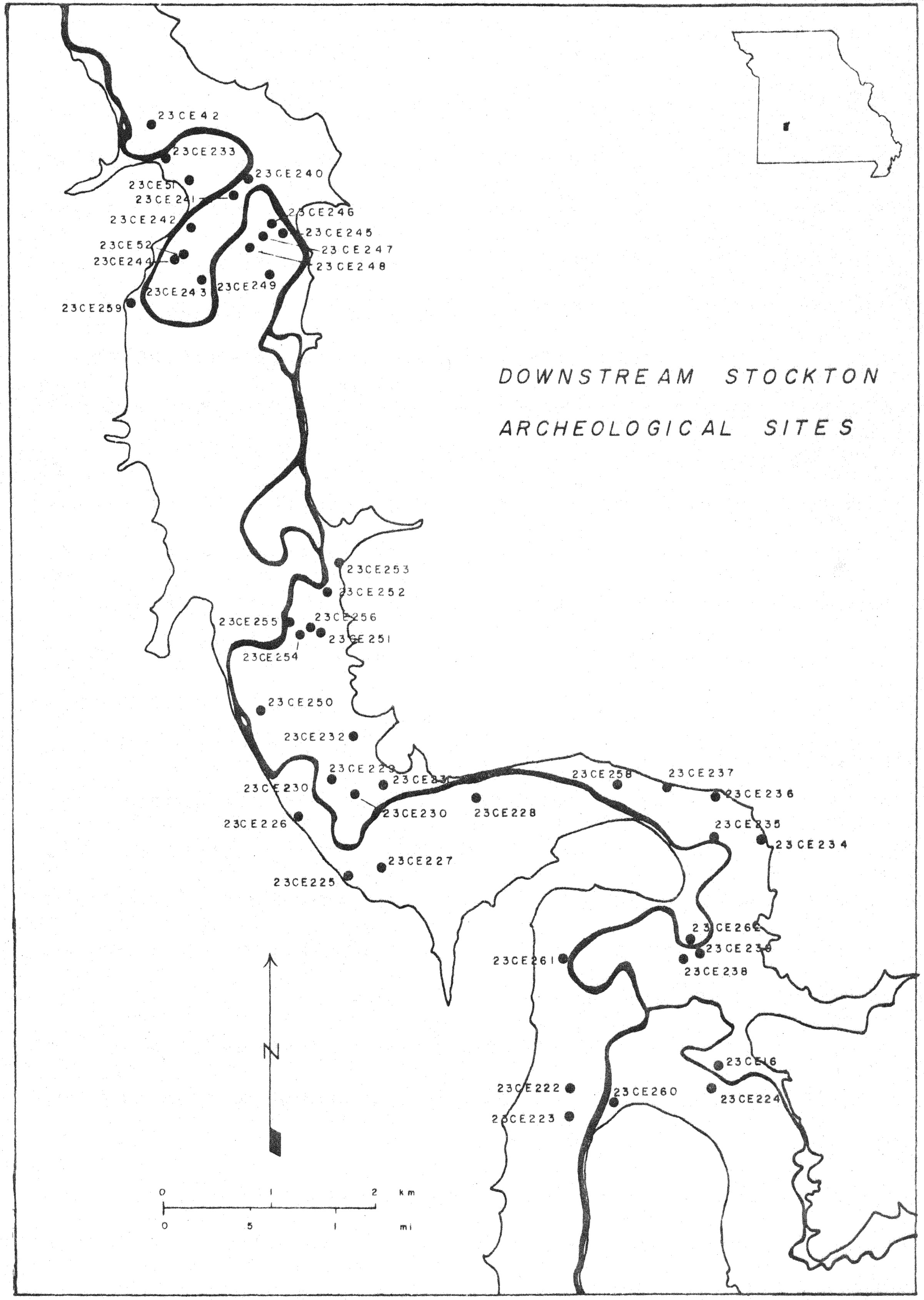

Figure 6. Downstream Stockton Archeological Sites

was carried out during the spring months when experience has shown that the fields are clear but have been well rained on since the last time they were worked. A tabulation of the "type of ground cover" figures in Table 2 shows that 34 of the 44 sites (77.3%) were in cultivated fields, one was in an apparently abandoned field, 7 were in pastures, one on a gravel bar (probably a result of redeposition), and one was exposed in a cut bank.

Tabulating and cross-tabulating figures on these 44 sites shows that 40 of 44 sites (93.2%) were recorded under conditions of 0 - 50% ground cover and ,of these, 22 had 0 - 10% ground cover. Two of the four with over 50% ground cover were shovel tested. Rainfall sufficiency figures were available for 39 sites. Of these, 36 (92.3%) had had moderate to heavy rainfall. Table 3a summarizes and compares these two sets of figures. Thirty-three of 39, therefore, were surveyed under what most would consider excellent survey conditions, viz., light ground cover and at least moderate rainfall.

The extent of ground cover does vary somewhat with the type of ground cover (Table 3b), but perhaps of even greater variation is the changing nature of the surface of cultivated fields during the year. Table 3c tabulates per cent of ground cover by month for the 34 sites recorded in cultivated fields. Although the probability is about one in

Table 2

Site Data - Downstream Stockton Survey

	Environment					Site Characteristics		Survey			
Site number	Elevation (ft)	Distance to water (km)	Direction to water	Distance to bluff base (km)	Exposure	Site area (in m^2)	Depth	% Ground Cover	Type	Rainfall	Field number
23CE16*	770-780	.1	SW	.3	Open	500	Unknown	0-10	Field	Heavy	JQ-3876-4
23CE42	754-762	.3	W	.7	Open	5,000	Unknown	0-10	Field	Heavy	JQ-33176-1
23CE51	760-770	.1	SE	.0	E	1,500	Unknown	10-50	Field	Light	JQ-33176-2
23CE52	764-768	.1	NW	1.1	Open	2,000	Unknown	0-10	Field	Heavy	JQ-4576-5
23CE222	780-782	.3	E	.4	Open	?	Unknown	0-10	Field	Heavy	JQ-3876-1
23CE223	782-784	.2	E	.5	Open	?	Unknown	0-10	Field	Heavy	JQ-3876-2
23CE224*	782-786	.1	NE	.3	Open	?	Unknown	0-10	Field	Heavy	JQ-3876-3
23CE225	770-780	.2	N	.1	NE	100	Unknown	0-10	Field	Heavy	JQ-31576-1
23CE226A	768-774	.2	N	.1	NE	650	Unknown	0-10	Field	Heavy	JQ-31576-2
23CE226B	768-770	.2	N	.1	NE						
23CE227	772-778	.3	NW	.3	Open	?	ca .5 m	0-10	Field	Heavy	JQ-31776-1
23CE228	772-776	.1	N	.6	Open	400	Unknown	10-50	Field	?	JQ-32576-1
23CE229	765-776	.1	SW	.3	Open	90,000	Unknown	10-50	Pasture	Heavy	JQ-32576-2
23CE230	770-774	.2	S	.3	Open	200	Unknown	50-90	Pasture	Heavy	JQ-32576-3
23CE231	770-776	.1	S	.2	Open	10,000	Unknown	10-50	Pasture	Heavy	JQ-32676-1
23CE232	774-780	.4	SW	.0	W	1,500	Unknown	10-50	Pasture	Heavy	JQ-32676-2
23CE233	758-762	.0	N	.0	NW	900	Unknown	10-50	Field	Light	JQ-33176-3
23CE234	776-778	.3	W	.1	W	2,000	Unknown	10-50	Field	Heavy	JQ-4676-1
23CE235	770-776	.0	S	.4	Open	1,750	Unknown	10-50	Field	Heavy	JQ-4676-2
23CE236	776-782	.3	S	.1	S	250,000	Unknown	0-10	Field	Heavy	JQ-4676-3
23CE237	772-776	.3	S	.0	S	800	Unknown	10-50	Field	Heavy	JQ-4676-4
23CE238	778-780	.1	N	.7	Open	4,200	Unknown	10-50	Field	Heavy	JQ-4776-1
23CE239	780-782	.1	N	.6	Open	2,400	Unknown	10-50	Field	Heavy	JQ-4776-2
23CE240	762-766	.1	NW	.7	Open	7,500	Unknown	0-10	Field	Heavy	JQ-4576-1
23CE241	760-764	.1	NW	.6	Open	1,000	Unknown	0-10	Field	Heavy	JQ-4576-2
23CE242	760-766	.1	NW	1.0	Open	1,375	Unknown	0-10	Field	Heavy	JQ-4576-3
23CE243	762-770	.1	E	1.0	Open	100,000	Unknown	0-10	Field	Heavy	JQ-4576-4

Table 2: Continued

Site Data - Downstream Stockton Survey

Site number	Elevation (ft)	Distance to water (km)	Direction to water	Distance to bluff base (km)	Exposure	Site area (in m²)	Depth	% Ground cover	Type	Rainfall	Field number
	Environment					Site Characteristics			Survey		
23CE244	766-768	.2	NW	1.3	Open	700	Unknown	0-10	Field	Heavy	JQ-4576-6
23CE245	764-768	.1	NE	.7	Open	300	Unknown	10-50	Field	Mod.	JQ-41476-1
23CE246	762-768	.1	NE	.7	Open	100	Unknown	10-50	Field	Mod.	JQ-41476-2
23CE247	762-768	.2	N	.8	Open	180	Unknown	10-50	Field	Mod.	JQ-41476-3
23CE248	762-766	.2	NW	.7	Open	600	Unknown	10-50	Field	Mod.	JQ-41476-4
23CE249	762-764	.2	SE	1.1	Open	200	Unknown	10-50	Field	Mod.	JQ-41476-5
23CE250	770-772	.2	W	.8	Open	625	Shallow	50-90	Pasture**	Heavy	JQ-42676-1
23CE251	768-774	.3	W	.2	W	4,000	Unknown	0-10	Field	Heavy	JQ-5376-1
23CE252	772-784	.1	NW	.1	W	?	Unknown	0-10 50-90	Road Pasture	Heavy	JQ-5376-2
23CE253	768-792	.0	W	.0	W	?	Probably over 1m	0-50	Field	Heavy	JQ-5476-1
23CE254	770-772	.1	W	.3	Open	4,200	Unknown	10-50	Field	Heavy	JD-43076-1
23CE255	770-772	.1	W	.4	Open	4,160	Unknown	10-50	Field	Heavy	JD-43076-2
23CE256	770-772	.2	W	.3	Open	2,000	Unknown	10-50	Field	Heavy	JD-43076-3
23CE258	770-778	.1	S	.0	S	?	Unknown	90-100	Abandoned Field**	Heavy	JQ-51276-1
23CE259	766-770	.1	E	.0	E	100	Unknown	0-10	Pasture	?	JQ-42276-1
23CE260	780-782	.1	W	.1	NW	?	Unknown	0-10	Field	Light	JAD-6776-1
23CE261	760+	.0	E		Open	?	Unknown	N.A.	N.A.***	N.A.	JAD-6776-2
23CE262	760-762	.0	W		Open	?	Unknown	0-10	Gravel Bar	N.A.	JAD-6876-1

* Site is on Bear Creek; all others are on the Sac River.
** This site was shovel tested; the others were not.
*** 23CE261 was exposed in a cut bank of the Sac River.

ten that such an observed distribution could occur by chance ($X^2=4.41$, DF=2, p=.10; see Davis 1973 for computing details for the Chi-square test) it does appear that the later in the spring sites in fields are surveyed, the greater the per cent of ground cover. Had this area been surveyed even later, the results would probably have been somewhat different.

A further evaluation of the survey would examine the amount of time spent examining a site. Correlation of the size of a site with the amount of time spent examining it exclusive of shovel tested sites, reveals a correlation of .26, meaning that there is very little relation between the two variables. Undoubtedly, much of this is due to differential densities of materials on the surface. Although crew composition varied slightly, for the most part this variable was reasonably constant. In any event, on all but a few days the crew, whatever its composition, was led by Jeff Quilter.

2. The Collections

Classificatory systems used in the analysis of artifact collections are many and varied, depending upon the nature and perhaps the size of the collections, and the purpose for which the classification is being carried out, among other factors. This is not necessarily a bad thing, although a

Table 3

Summary of survey conditions

a. Rainfall and extent of grcund cover

	Rainfall			
%ground cover	Light	Moderate	Heavy	Total
0-10%	1	0	17	18
10-50%	2	5	11	18
50-90%	0	0	2	2
90-100%	0	0	1	1
	--	--	--	--
Total	3	5	31	39*

*Rainfall figures were not recorded on five sites

b. Type of ground cover and extent of ground cover

%ground cover	Field	Pasture	Total
0-50%	34	4	38
50-100%	1	3	4
	--	--	--
	35	7	42*

*Does not include the site on a gravel bar or the one in a cut-bank

c. Month and extent of ground cover in fields

	Month			
%ground cover	March	April	May and June	Total
0-10%	8	7	2	17
10-50%	3	13	1	17
	---	---	---	---
	11	20	3	34*

*Does not include the site in an abandoned field frequent by-product is difficulty in comparing reports on two or more aggregates classified by different systems. This difficulty actually is engendered not so much by the diversity of classification systems itself, as by a failure to clearly state classification criteria.

Assemblages are always divided into a series of classes, each of which still generally retains a certain amount of variability. Although we often talk about description of our classes, we actually should make a distinction between "definition" and "description". Definition of units in a classification system requires a statement of criteria for assignment of specimens to the classes, whereas description involves a statement of the variability remaining within each class (cf. Dunnell 1971:17). The criteria for assigning of specimens to classes may be many and varied, but a statement of these criteria (i.e., a definition) allows a direct comparison of the classification system with other systems and, perhaps more importantly, permits replication of the system.

We may consider a stone assemblage to have four aspects: raw material, morphology, technology, and function. The classification of the Downstream Stockton survey collections involved a preliminary sort by raw material. This was not difficult, since no pottery was found, and only 8 artifacts were not made of chert. Beyond this level, the definitions of classes are based primarily on morphological and technological criteria, while much of the remaining variability described within each class probably relates to tool function and/or chronology. A schematic diagram of definition criteria is given as Figure 7. Furthermore, a summary of defining criteria is given prior to the description of each class, while informal groups of classes which share a large number of common definition criteria are discussed more fully at appropriate places. Certain terms used in defining classes are explained in the Glossary (Appendix A).

The discussion here applies only to prehistoric material. The 1939 U.S.G.S. Caplinger Mills quadrangle shows a house in the middle of an area where the scatter for 23CE253 was observed. Although this house is no longer standing (even the foundation is obliterated), a large amount of Euro-American material was observed and collected. This material is separately described by Russell L. Miller in Appendix B.

Class 1 - Points - 70 specimens - Plates 1, 2a-k,m

Defining criteria - chert as raw material; bifacially worked; haft element present; lateral margins meet in a point; broken specimens lacking the point are classed with these specimens if a haft element is present.

FIGURE 7 -- KEY TO ARTIFACT TYPOLOGY

START
↓
1. CHERT AS RAW MATERIAL? → NO → GO TO 23
↓
YES → GO TO 2

2. BIFACIALLY WORKED? → NO → GO TO 15
↓
YES → GO TO 3

3. STEEPLY BEVELED TRANVERSE EDGE? → NO → GO TO 4
↓
YES → CLASS 2 – HAFTED SCRAPERS

4. POINTED END? → NO → GO TO 7
↓
YES → GO TO 5

5. HAFTED? → NO → GO TO 6
↓
YES → CLASS 1 – POINT

6. BROKEN? → NO → CLASS 3 – POINTED, UNHAFTED BIFACE
↓
YES → CLASS 6 – POINTED END SEGMENTS

7. BROKEN? → NO → GO TO 14
↓
YES → GO TO 8

8. HAFTED? → NO → GO TO 9
↓
YES → CLASS 1 – POINT (BROKEN)

9. TWO TRANVERSE FRACTURES? → NO → GO TO 11
↓
YES → GO TO 10

10. LONGITUDINAL BREAK? → NO → CLASS 11 – MEDIAL SEGMENTS
↓
YES → CLASS 12 – LONGITUDINALLY BROKEN MEDIAL SEGMENTS

11. SQUARED END? → NO → GO TO 13
↓
YES → GO TO 12

12. LONGITUDINAL BREAK? → NO → CLASS 7 – SQUARED END SEGMENTS
↓
YES → CLASS 9 – LONGITUDINALLY BROKEN END SEGMENTS

13. LONGITUDINAL BREAK? → NO → CLASS 8 – ROUNDED END SEGMENTS
↓
YES → CLASS 10 – LONGITUDINALLY BROKEN ROUNDED END SEGMENTS

14. SQUARED END? → NO → CLASS 5 – OVOID BIFACES
↓
YES → CLASS 4 – AXES/ADZES

15. STEEPLY BEVELED EDGE? → NO → GO TO 16
↓
YES → CLASS 14 – SCRAPERS

16. USED AND/OR RETOUCHED? → NO → GO TO 17
↓
YES → CLASS 15 – RETOUCHED AND/OR UTILIZED FLAKES

17. FLAKE? → NO → GO TO 21
↓
YES → GO TO 18

18. CORTEX PRESENT? → NO → GO TO 19
↓
YES → CLASS 19 – CORTEX FLAKE

19. HARD HAMMER FLAKE? → NO → CLASS 22
↓
YES → GO TO 20

20. OVER 50 mm.? → NO → CLASS 21 – SECONDARY FLAKE
↓
YES → CLASS 20 – PRIMARY FLAKE

21. PLATFORM REMAINING? → NO → CLASS 18 – SHATTER
↓
YES → GO TO 22

22. BATTERING PRESENT? → NO → CLASS 16 – CORE
↓
YES → CLASS 17 – HAMMERSTONE

23. PITTING PRESENT? → NO → CLASS 24 – MANO
↓
YES → CLASS 23 – NUTTING STONE
↓
FINISH

Comment - As previously explained, our major, indeed almost sole, means of recognizing the temporal sequence in the Sac River bottoms is point morphology. We have therefore chosen to describe the immense variability in the class point from a chronological perspective.

Seventy points were collected from the surface of sites in the Downstream Stockton area. A large number of these were identifiable to type and time period, thus giving us a preliminary temporal control on sites. Although often referred to as projectile points, it has been shown (e.g. Ahler 1971) that these tools functioned for a far wider range of tasks. Whatever the function, however, the morphological class itself does exhibit regular temporal variability permitting us to use it for chronological inference. Basic descriptive attributes of the specimens are given in Table 4.

Description - A single Dalton point was found in the water immediately below a cut-bank from which flakes of similar chert were eroding. It is inferred that the Dalton is from this location. The specimen is of white chert, heavily ground on lateral margins and on the highly excurvate eared base. The lateral margins are nearly straight and have sharp serrations. The tip is missing. The specimen is not fluted but does exhibit basal thinning.

A single Rice Lobed point was found on a gravel bar. The locus has been designated 23CE262, although it was thought by the survey crew to be redeposited from somewhere else. The specimen is complete and conforms well to the type description given by Chapman (1975:254), although the margins of the stem are not ground and the base exhibits only light grinding.

Three other lobed points or parts of them were collected. Typological identification of these specimens is uncertain, although the fact that two of the three came from sites on which other Middle Archaic forms were collected may strengthen the case for their identification. Two of the three have lateral and basal grinding, while all have concave bases. The blades of the two complete specimens are heavily reworked.

Four broken specimens are identified as Big Sandy Notched (Chapman 1975:242). All have broad but rather shallow side notches and straight lateral margins. Bases intact enough to observe are straight. This is a very common point style throughout the Ozarks during the Middle Archaic period (e.g., Logan 1952, Klippel 1971, Roberts 1965, McMillan 1965, Fowler 1957).

A single tentative Jakie-stemmed point was collected from 23CE227. The point fits the description given for the type (Chapman 1975:250-251) except for having a rather

Table 4

Basic Descriptive Attributes of Points

Catalog No.	L	W	T	Haft L	Notch W	Base W	Basal Grinding	Lateral Grinding	Haft Morphology	Lateral Margins	Base	Color	Heat Treatment	Type
23CE261-1	(55)	27		21	22	27	+	+	Lanc.	St	Cc	Wh	-	Dalton
23CE262-1	65	31		11	17	20	+	-	ES	Rcv	Cc	Wh	-	Rice Lobed
23CE235-35	(46)	30	9	14	20	(25)	-	-	SN	St	St	Gr	+	Big Sandy Notched (?)
23CE242-11	(35)	35	9	14	26	*	+	-	SN	St	*	Tan	-	Big Sandy Notched
23CE253D-12	(37)	31	9	12	22	*	-	-	SN	St	*	Pink	-	Big Sandy Notched
23CE253D-20	(22)	(25)	7	*	*	*	*	+	SN	*	*	Wh	-	Big Sandy Notched
23CE227-14	35	22	5	10	12	17	+	+	ES	Cv	Cc	Wh	?	Jakie Stemmed (?)
23CE227D-33	31	27	8	10	22	25	+	+	ES	Cv	Cc	Wh	?	?
23CE237-41	(24)	(24)	9	*	*	23	-	-	SS	*	Cc	Wh	-	?
23CE253A-41	38	26	7	12	23	26	+	+	ES	Cv	Cc	Wh-Purp	-	?
23CE227B-46	(28)	(29)	7	12	13	18	+	-	BN	St	St	Wh	-	Smith
23CE227D-32	70	50	10	16	26	26	-	-	BN	St	St	Wh	-	Smith
23CE253D-3	(43)	(56)	10	15	24	25	+	-	BN	*	St	Wh	-	Smith
23CE227D-39	(33)	33	6	11	22	26	+	+	CN	Rcv	St	Wh	-	Etley
23CE242-13	(25)	(27)	6	11	15	20	+	+	CN	*	St	Pink	-	Afton
23CE248-1	(46)	33	6	13	19	25	-	-	CN	Cv	Cv	Wh	?	Afton
23CE250A-25	(33)	35	7	14	20	24	+	+	CN	*	Cv	Wh	?	Afton
23CE253B2-1	43	30	6	12	21	22	+	+	CN	Cv	St	Wh	?	Afton
23CE258-3	(41)	24	7	16	11	18	+	-	CN	St	Cv	Wh	-	Cupp
23CE253D-21	(26)	23	6	13	16	19	+	+	ES	St	St	Wh-Pink	-	?
23CE248-18	58	29	11	13	19	(18)	-	-	SS	Cv	St	Grey	-	?
Isol. Find	(69)	46	12	12	19	16	-	-	SS	Cv	St	Grey	?	?
23CE227-1	(29)	18	5	9	11	17	+	+	CN	St	St	Wh	-	Small dart
23CE227-15	33	18	6	10	14	18	+	-	CN	Cv	St	Pink	-	Small dart

Table 4: Continued

Basic Descriptive Attributes of Points

Catalog No.	L	W	T	Haft L	Notch W	Base W	Basal Grinding	Lateral Grinding	Haft Morphology	Lateral Margins	Base	Color	Heat Treatment	Type
23CE227-24	(26)	20	6	10	11	18	-	-	CN	St	Cv	Wh	-	Small dart
23CE234-1	(37)	23	6	10	15	20	-	-	CN	St	St	Pink	-	Small dart
23CE224-10	(39)	32	7	17	22	12	-	-	CS	St	Cc	Wh	-	Langtry
23CE229A-1	(52)	32	9	18	23	10	-	-	CS	St	Cc	Grey	-	Langtry
23CE229C-3	53	31	7	18	22	10	+	+	CS	St	Cc	Wh	-	Langtry
23CE229-25	(57)	45	11	18	23	11	-	-	CS	St	Cc	Wh	-	Langtry
23CE249-5	(39)	(28)	7	19	(24)	16	+	+	CS	*	Cc	Wh	-	Langtry
23CE242-14	(39)	28	9	20	21	0	-	-	CS	*	Cv	Wh	-	Gary
23CE255-16	(40)	28	8	16	17	0	-	-	CS	Cv	Cv	Grey	-	Gary
23CE244-2	(36)	(30)	10	(26)	*	(30)	-	-	ES	*	Cc	Red	?	Rice Side-Notched
23CE251A-13	(43)	(32)	11	22	26	27	-	-	ES	Cv	St	Wh	-	Rice Side-Notched
23CE227-16	(17)	15	4	6	6	11	-	-	CN	St	Cv	Pink	-	?
23CE236C-12	(21)	13	3	*	5	*	*	*	CN	St	*	Wh	-	?
23CE241-9	(26)	15	5	*	9	*	*	*	CN	St	*	Wh	-	?
23CE243-3	22	11	3	5	7	(8)	-	-	CN	St	St	Wh	-	?
23CE244-3	(21)	(10)	3	*	*	*	*	*	*	St	*	Wh	-	?
23CE244-4	17	10	4	5	5	8	-	-	CN	St	St	Tan	-	?
23CE245-1	23	12	4	6	6	11	-	-	CN	St	St	Pink	-	?
23CE245-2	(17)	12	4	5	7	12	-	-	SN	Cv	St	Wh	-	?
23CE245-5	(14)	8	2	3	3	5	-	-	SN	Cv	St	Pink	-	?
23CE258-1	12	8	3	4	5	7	-	-	CN	Cv	St	Pink	-	?
23CE258-2	16	11	3	4	5	7	-	-	CN	St	St	Pink	-	?
23CE245-3	(27)	16	4	9	7	16	-	-	SN	St	Cv+ Notch	Pink	-	?
23CE253A-64	(15)	12	3	3	5	*	-	-	SN	St	Cc	Wh	-	?
23CE243-2	26	15	4	-	-	13	-	-	-	Cv	Cv	Wh	-	?
23CE245-4	(21)	13	3	-	-	12	-	-	-	St	Cc	Wh	-	?

Table 4: Continued

Basic Descriptive Attributes of Points

Catalog No.	L	W	T	Haft L	Notch W	Base W	Basal Grinding	Lateral Grinding	Haft Morphology	Lateral Margins	Base	Color	Heat Treatment	Type
23CE240-4	23	12		5	10	9	*	*	SN	Cv	Cc	Wh	-	?
23CE226B-2	(14)	11	3	5	7	10	-	-	SN	St	St	Wh	-	?
23CE253B-13	(17)	23	6	-	-	14	+	+	Lanc	St	St	Wh	-	?
23CE243-1	42	26	6	10	17	(19)	-	-	ES	Cv	St	Wh	+	?
23CE250A-26	(37)	26	5	*	14	*	*	*	CN	St	*	Wh	-	?
23CE237-44	(14)	30		*	*	30	-	-	ES	*	St	Tan	-	?
23CE253A-63	(24)	(20)		12	*	*	-	-	CN	*	St	Wh	-	?
23CE253C-7	65	39	9	17	24	*	-	-	SS?	St	*	Wh	-	?
23CE16-7	(25)	(31)	5	6	15	(15)	*	-	CN	St	*	Grey	-	?
23CE52-1022	(17)	(23)		7	*	*	-	-	CN	St	St	Wh	-	?
23CE52-1023	(26)	25	5	5	12	16	-	-	CN	St	St	Pink	-	?
23CE240-3	(19)	25	5	5	16	17	-	-	CN	St	St	Wh	-	?
23CE242-12	(30)	(23)		*	*	*	*	-	CN	St	*	Wh	-	?
23CE250A-27	(30)	(26)	6	*	15	*	-	-	CN	St	Cv	Wh	-	?
23CE252-7	(35)	(30)	7	15	25	23	-	-	SS	St	Cc	Tan	-	?
23CE224-8	(34)	38	8	18	29	25	-	-	SS	*	Cv	Wh	-	?
23CE253A-13	(50)	40	9	18	27	27	-	-	CN	St	Cv	Wh	-	?
23CE253A-69	63	39	12	10	26	23	-	-	CN	St	St	Wh	-	?
23CE253D-11	(53)	(40)	11	12	24	29	-	-	CN	Cv	Cv	Wh	-	?
23CE259-1	(30)	26	10	-	-	(18)	+	+	Lanc	St	Cv	Grey	-	?

longer barb on one shoulder than is normal (the other side is broken). This type is also common throughout the Ozarks and southwest Missouri during the Middle Archaic period.

Three Smith points were collected. The Smith is a basal notched form with narrow notches, long barbs, and a generally square haft element. Two of the three Sac River specimens are broken badly; the other is missing only a barb. All are made of white, probably Burlington, chert. Its temporal relations are unclear. Chapman (1975:286) considers it primarily Late Archaic and it is similarly considered as such at Rodgers Shelter (Wood and McMillan 1969:17). However, its context at Rodgers is immediately after a 3000-year cultural hiatus. Basal notched points in contexts dated as contemporary with this gap do occur elsewhere (e.g. McMillan 1965:73; O'Brien, et al. 1973; Klippel 1971). In general, we may probably consider the Smith point as late Middle Archaic to Late Archaic.

Only a single specimen, and a somewhat dubious one at that, of an Etley point was collected. The Etley point is widely distributed in Missouri and Illinois during the Late Archaic period (see Chapman 1975:ch. 8). Preliminary examination of the collections from the Truman Reservoir survey as well as of the literature on surrounding areas shows it to be more common in the more heavily forested river valleys such as the Pomme de Terre valley in Missouri and the Illinois River valley in Illinois. Although it is broken, the Sac River specimen has recurvate lateral margins, short barbs, and a straight base.

Four points are identified as Afton. This type was first identified in northeast Oklahoma (Bell 1958:6) but is also found in southwest Missouri, northwest Arkansas, and southeast Kansas. It is recognized by its angular margins, and barbed corner notched straight to convex based haft element. It is a rather thin point. Several of the Sac River specimens are broken but their remaining portions conform rather well to the type description.

The Cupp point is a rather uncommon point style. Only a few specimens have been found in the Truman Reservoir, but none at all are reported from any Stockton Reservoir report. They occur, however, in Stratum 4 at Rodgers Shelter. The range of the Cupp point is apparently similar to that listed above for the Afton point (Perino 1968:20). The blade of the point is a long narrow isoceles triangle with straight margins. The corner notches are proportionally large and ellipsoidal. The shoulders have slight barbs, while the base is highly convex. There is a single specimen from the Downstream Stockton survey.

Four small dart points (type otherwise unnamed) similar to those found in Late Archaic contexts at Rodgers Shelter (Wood and McMillan 1969:17) were found . Three of these four were collected from a single site - again, a site with three other Late Archaic points. Stylistically, the points vary somewhat, but all have broad notches, straight bases, and straight lateral margins. Three are essentially intact, but the fourth exhibits impact fracturing on the distal end.

Two square stemmed points were collected from the surface of 23CE243. Similar specimens occur in Rodgers Shelter as well as at other Late Archaic sites in southeast Missouri (Chapman 1975:186-191). The base is straight; lateral margins of the haft element are straight to slightly expanding; shoulders are not barbed but are prominent; and the lateral margins of the blade are slightly excurvate.

Five Langtry points or major fragments thereof were collected from three different sites. The Langtry is a contracting stemmed point with a straight or (as in the case of all five of the present specimens) concave base. Shoulders are prominent but are not barbed. Blades are triangular with straight margins. The Langtry is very common in Woodland contexts in both southwestern Missouri and southeastern Kansas (e.g., Marshall 1972).

The Gary point is also a contracting stemmed form, but with a rounded or excurvate rather than straight or concave base. One Downstream Stockton specimen has barbed shoulders and straight lateral margins on the broken blade. One edge retains a suggestion of fine serrations. Another tentative specimen retains only the haft element. Like the Langtry, the Gary point is well known in the Woodland period. Gary points were recovered in large numbers at the Flycatcher Village site (23CE153) in Stockton Reservoir. A date of A.D. 715±95 (Pangborn, Ward, and Wood 1967:21) was obtained from this site although this date is from a structure that produced no diagnostic material. Similar dates were obtained at the Infinity Site (14MY305) in southeast Kansas, where 127 Gary points were collected (Marshall 1972:59-60). Although the exact relationship of the points and dates is unclear, dates of A.D. 780±80 and A.D.970±80 (Marshall 1972:93) were obtained from an area of the site where a large number of both Gary and Langtry points were recovered.

Two Rice Side-Notched points are both rather badly broken but are identified with some certainty. The Rice Side-Notched is an expanding stemmed form with very broad, shallow side notches. The base is straight on one specimen and concave on the other. This form is also common in the Late Woodland in southwest Missouri.

A variety of small points, both notched and unnotched, are associated with the Late Woodland and Mississippian occupations of western Missouri and of the Midwest in general. Although a variety of names are associated with this formally heterogeneous group of points, the names are not used here, primarily because they are a product of seemingly unwarranted gross splitting but also because no new chronological information would be gained by differentiating all these types. A total of 16 of these small points were collected. Two are triangular, the remainder are either corner or side-notched. Plate 2e-k illustrates much of the range of variation in this group. Small points such as these are widely scattered throughout the Midwest during the Late Woodland and Mississippian (Late Prehistoric) periods.

The remaining 20 points could not be identified with any certainty either because they were too fragmentary, or because they are of a class that is not described in the literature and are therefore not now temporally meaningful. They are, however, also listed in Table 4.

The chronological sequence represented in the Downstream Stockton study area therefore essentially covers the entire documented sequence in this part of Missouri, with the apparent exception of the Middle Woodland period. The presence of Dalton was a pleasant surprise. Although several Dalton sites have been recorded in Truman Reservoir, they are so infrequent that any single example adds considerably to our understanding of this period. Essentially the same could be said about the Middle Archaic material. Although points representative of Middle Archaic occupations occur regularly in survey collections, their distribution and associated settlement pattern is very poorly known. The presence of (relatively) large amounts of Late Archaic and Late Woodland material was expected. Although settlement patterns of these periods are not well known and, indeed, there is very little documentation in the immediate vicinity of the study area, the distribution of these point styles is fairly well known.

The site-by-site distribution of this material in the Downstream Stockton area is given in Table 5. Of the 44 sites examined in this report, 22 (50%) yielded temporally identifiable material. One of these sites is a buried single component Dalton site. Six sites have Early to Middle or Middle Archaic material. Three of these six are single component, so far as is known; the other three are known to be multicomponent. Late Archaic material is found on eight sites, only three of which are single component. Woodland material is the best represented, occurring on 15 sites. Happily, ten of these sites appear to be single component.

This chronological information will be used shortly to discuss patterns of cultural stability and change in the Sac River bottoms.

Table 5

Distribution of Points

	Dalton	Rice Lobed	Big Sandy	Jakie stemmed-like	Lobed	Smith	Afton	Etley	Square stemmed	Cupp	Small dart	Langtry	Gary	Rice side notched	Triangular	Young	Cahokia	Scallorn & other small points	Lanceolate	Large corner-notched	Corner notched, long barb	Miscellaneous & unidentified	Total
23CE16																					1		1
23CE42																							0
23CE51																							0
23CE52																					1	1	2
23CE222																							0
23CE223																							0
23CE224												1								1			2
23CE225																							0
23CE226																	1						1
23CE227				1	1	2		1			3							1					9
23CE228																							0
23CE229												3											3
23CE230																							0
23CE231																							0
23CE232																							0
23CE233																							0
23CE234											1												1
23CE235			1																				1
23CE236																		1					1
23CE237					1																	1	2
23CE238																							0
23CE239																							0
23CE240																					1		1
23CE241																		1					1
23CE242			1				1						1									1	4
23CE243									1							1		1				1	4
23CE244														1				2					3

Table 5: Continued

Distribution of Points

	Dalton	Rice Lobed	Big Sandy Jakie stemmed-like	Lobed	Smith	Afton	Etley	Square stemmed	Cupp	Small dart	Langtry	Gary	Rice side-notched	Triangular	Young	Cahokia	Scallorn & other small points	Lanceolate	Large corner-notched	Corner notched, long barb	Miscellaneous & unidentified	Total
23CE245														1		1	3					5
23CE246																						0
23CE247																						0
23CE248						1																1
23CE249											1											1
23CE250						1															2	3
23CE251													1									1
23CE252																					1	1
23CE253			2	1	1	1	1?										1	1	3		2	13
23CE254																						0
23CE255												1										1
23CE256																						0
23CE258									1								2					3
23CE259																						0
23CE260																						0
23CE261	1																					1
23CE262		1																				1

Class 2 - Hafted "scrapers" - 4 specimens - Plate 21

Defining criteria - chert as raw material; bifacially worked; single steep unifacially beveled transverse edge.

Description - Specimens range in length from 34 to 46 mm, and in width from 21 to 49 mm. The working edge is convex on three specimens, and straight on the fourth. The angle of the edge varies from 60 to 80 degrees and generally duplicates the range of edge angles Wilmsen (1970:71) found associated with endscrapers.

Other Bifaces -

As a general commentary on the next 10 classes of artifacts, it should be stated that for present purposes a biface refers to any chipped stone tool or fragment thereof, exhibiting chipping and/or retouch extending onto both faces and lacking any obvious provision for hafting. The surfaces of 35 sites yielded 196 bifaces.

For purposes of defining the classes of bifaces, the artifact was considered to have four, or sometimes three, edges - two lateral and two extreme in the case of most classes; two meeting in a point plus an extreme edge in the few remaining cases. The extreme edges may take one of two forms: 1) squared - in which case the edge is set off from the lateral margins by reasonably distinct points of juncture; and 2) rounded - in which case the edge is continuous with the lateral margins and is not distinctly set off from them. In addition, two types of fracture may occur - transverse, i.e., lateral margin to lateral margin, and longitudinal - extreme end to extreme end. Using extreme ends and fracture types, ten classes of bifaces were distinguished, as indicated in the classification schematic (Figure 7). Note however, that several other classes are logically possible but were not observed in these collections.

For descriptive purposes, analysis concentrated on edges rather than on whole tools. This was done for two reasons: first, any chipped stone tool may well have served a variety of functions. Recent trends in lithic analysis have begun to account for this fact of behavior by analysis at the sub-tool level (e.g., Dancey 1973, Schiffer 1976). Second, only 25 of the 196 (12.8%) bifaces were complete. Therefore some means of comparing tools was necessary. Analysis of edges provides a means of comparing comparable parts. In particular, the angle of the edge was felt to be an important variable. Wilmsen (1970) and Semenov (1964), among others, discuss the question of optimal edge angles for particular cutting, scraping, chopping, etc. tasks.

Class 3 - Pointed, unhafted bifaces - 7 specimens - Plate 2n

Defining criteria - chert as raw material; bifacially worked; unbroken specimen with one end pointed, other end rounded; a haft element lacking.

Description - The seven Downstream Stockton specimens range in length from 54 to 98 mm, and in width from 37 to 51 mm. Most lateral margins are convex and meet in a point at an angle of 50 to 90 degrees, 65 degrees being the median value. Edge angles range from 35 to 90 degrees but most fall into either the 35 - 45 or 65 - 75 degree range (Table 6) Cross sections are normally plano-convex but may be assymetrical - i.e., one margin is steeper than the other. The rounded end uniformly lacks grinding and has an edge angle of 30 - 60 degrees.

Class 4 - Axes/Adzes - 3 specimens - Plate 2o-p

Defining criteria - chert as raw material; bifacially worked; unbroken specimen with one end squared, one end rounded.

Description - these three tools range from 63 to 115 mm in length and 43 - 75 mm in width. Lateral margins are straight on two specimens, concave on the other, and are found on two of the specimens (the concave- sided specimen and one of the straight-sided specimens). Two of the specimens have unifacial chipping on the square end , and

Table 6

Lateral Edge Angle Distribution
by Class of Bifacial Tool*

	3	4	5	6	7	8	9	10	11	12
20°				2	3	1		1	4	2
25°			1	4		4	1		8	
30°		1	4	12	9	10	2	2	20	3
35°	1		3	9	1	12	1	1	9	5
40°	3		1	14	5	24	1	3	8	5
45°	2	1	7	6	3	12		3	7	3
50°			4	9	1	10	1		5	3
55°	1		2	1	1	9	3		5	1
60°		1	2	1		10			2	2
65°	2		1	2	2	3				
70°	3		1	2		2		1		
75°	1	3	1		1	2				
80°			2			1	1			
85°						2				
90°	1		1							
Total	14	6	30	62	26	102	10	11	68	24

* Counts represent number of edges rather than number of tools; in the case of classes 7, 8, and 10 the number of lateral edges equals the number of tools, in all other cases it is equal to number of tools X 2.

all squared ends range from 50-70 degrees. All rounded ends exhibit grinding, and these bifacially chipped edges have an angle of 35 - 50 degrees.

Comment - These artifacts are quite similar to those labelled "chipped stone axes/adzes" at Rodgers Shelter (Ahler and McMillan 1976:179).

Class 5 - Ovoid bifaces - 15 Specimens - Plate 3a

Defining criteria - chert as raw material; bifacially worked; an unbroken specimen has two rounded ends.

Description - Lengths of these specimens range from 25 to 85 mm, widths from 16 to 62 mm. Shape of lateral edges is not quite evenly divided between straight and convex - there being slightly more convex edges. None of these edges, however, are ground. Edge angles vary between 30 and 95 degrees with the majority (25 of 30 edges) 60 degrees or less (Table 6). Rounded extreme ends are also not ground, and have angles ranging from 25 to 90 degrees. However, 24 of 30 of these edges are similarly 60 degrees or less, a pronounced mode occurring at 45 degrees.

Class 6 - Pointed End Segments - 31 specimens - Plate 3b-c

Defining criteria - chert as raw material; bifacially worked; the broken specimen is truncated by a single transverse fracture, with retained portions of lateral margins meeting in a point.

Description - Shapes of lateral margins are straight to convex, with slightly more straight-sided than convex-sided specimens. These edges exhibit no grinding. Angles vary from 20 to 70 degrees, although 53 of 62 edges are between 30 and 50 degrees (Table 6). These edges meet in a point at an angle of between 25 and 90 degrees. Within this latter range, a small group has angles of 25 to 35 degrees, while all but one of the remaining specimens have angles of 50 to 80 degrees. This last group corresponds closely with the point angles of the Class 3 bifaces.

Class 7 - Squared end segments - 31 specimens - Plate 3*d*-*f*

Defining criteria - chert as raw material; bifacially worked broken specimen, truncated by a single transverse fracture, with portions of lateral edges retained in addition to a straight extreme end.

Description - All retained portions of lateral margins are straight and only two specimens exhibit grinding. The angles of the lateral margins range from 20 - 75 degrees, although, 20 of 26 fall between 30 - 55 degrees and 18 of these 20 fall between 30 - 45 degrees (Table 6). Lengths of the straight extreme ends range from 21 to 69 mm, while these same bifacially chipped edges have angles varying from 20 - 65 degrees.

Class 8 - Rounded end segments - 52 specimens - Plate 3g

Defining criteria - chert as raw material; bifacially worked; broken specimen is truncated by a single transverse fracture, portions of both lateral margins retained, rounded end continuous with lateral margins.

Description - Lateral margins are convex more often than straight, and are convex on only a single specimen. They are rarely ground. Edge angles range from 20 - 85 degrees, but 92 of the 102 edges are 60 degrees or less (Table 6). This distribution therefore is similar to that of Class 5 specimens, of which at least some of these may be broken specimens. The extreme end is ground on only a single example. As with the Class 5 specimens again, most edge angles (48 of 51) are 60 degrees or less, but with definite modes at 40 and 60 degrees.

Class 9 - Longitudinally broken squared end segments
10 specimens

Defining criteria - chert as raw material; bifacially worked; broken specimen, truncated by a transverse fracture which is intersected by a longitudinal fracture; one lateral margin is entirely missing, while the extreme end is straight but truncated.

Description - The shape of the single remaining lateral margin is either straight or convex and is ground in only a single instance. On all but one specimen this edge has an angle of 35 - 55 degrees; the remaining edge measures 80 degrees (Table 6). The remaining portion of the end of the piece is bifacially chipped in six instances, unifacially chipped in the other four. The angle of this edge measures 30 - 80 degrees, with a mode at 60 degrees.

Class 10 - Longitudinally broken rounded end segments
10 specimens

Defining criteria - chert as raw material; bifacially worked; broken specimen is truncated by a transverse fracture; one lateral margin is entirely missing, extreme end rounded but truncated by a longitudinal fracture.

Description - The shape of the remaining portion of the remaining lateral margin is straight on two pieces, and convex in the remaining cases. None of these edges are ground. Angles on ten specimens range from 20 - 45 degrees, only one of which is less than 30 degrees. The 11th specimen has an angle of 70 degrees (Table 6). The remaining portion of the rounded extreme end is not ground in any instance. Eight of the 11 specimens have extreme edge angles of 30 - 50 degrees, one equals 60 degrees, and the other two measure 70 degrees.

Class 11 - Medial Segments - 34 specimens - Plate 3*h*

Defining criteria - chert as raw material; bifacially worked; broken specimen has two parallel transverse fractures; both ends are lost but portions of both lateral margins remain.

Description - Most medial segments are rather short, the present specimens ranging from 14 to 43 mm in length. Width varies from 15 to 75 mm, indicating great variation in original size. A correlation of .27 between length and width suggests that breakage is not very systematic. Most retained edge segments are straight; none are ground. Edge angles range from 20 - 60 degrees with a very pronounced mode (20 of 68 edges at 30 degrees (Table 6).

Class 12 - Longitudinally broken medial segments

24 specimens

Defining criteria - chert as raw material; bifacially worked; broken specimen. Two parallel transverse fractures with an additional longitudinal fracture; only a medial portion of a single lateral edge remains.

Description - On 11 specimens the retained portion of the lateral margin is straight; on 10 it is convex, and on the remaining three it is concave. As with the above class, edge angles range from 20 - 60 degrees, the mode falling at 35 to 40 degrees (Table 6).

Class 13 - Miscellaneous - 13 specimens

These are the only artifacts in the collections not included in the schematic classification given above, and thus are not defined by the extreme end - fracture pattern criteria. All 13 are definitely bifacially worked, and are made of chert, but are so fragmentary as to preclude a reliable assignment to any of the previous classes.

Unifacial tools -

The unifacial tools in the next two classes are defined as chert artifacts exhibiting chipping and/or retouch on one face only and lacking any obvious provision for hafting.

Class 14 - Scrapers - 18 specimens - Plate 3*i*-*k*

Defining criteria - chert as raw material; unifacially worked; steep beveled edge.

Description - All specimens in this class are made on a flake of varying thickness. Five are on decortication flakes, the rest are on flakes without cortex. Five scrapers have steeply beveled working edges on the lateral as well as on the distal margins of the flakes; on the other 13 the working edge is restricted to the distal end of the flake. Edge angles of side working edges vary from 45 - 85 degrees; of distal edges from 60 - 90 degrees. Distal edges in particular are therefore within the range of angles found to be best for scraping (e.g., Wilmsen 1970:71).

Class 15 - Retouched and/or utilized flakes
186 specimens

Defining criteria - chert as raw material; working consists exclusively of retouch and/or utilization along the margins of one face only.

Description - As with bifaces, these tools were analyzed on the basis of edges. Each tool was oriented, dorsal side up, with the striking platform toward the observer. It was then considered to have four edges: A - left lateral, B - right lateral, C - distal end, D - proximal end. The number of utilized and/or retouched edges, and the angle and shape of each worked edge was recorded.

Of the total number of flakes, 118 had only one edge worked, 61 had two worked edges, and 7 had three worked edges. No flakes were found with all four edges either retouched or utilized.

Table 7 tabulates edge angles on each margin. It is readily apparent that lateral margins are far more frequently used than are extreme ends, and distal ends are more frequently used than are proximal ends. A further

Table 7

Edge Angle Distribution by Margin*
(Retouched and/or Utilized Flakes)

	A	B	C	D	Total
15°	1	0	0	0	1
20°	0	1	1	0	2
25°	1	0	1	0	2
30°	2	2	1	0	5
35°	4	3	0	0	7
40°	3	10	3	0	16
45°	8	10	4	0	22
50°	14	14	6	0	34
55°	11	11	4	0	26
60°	18	13	5	1	39
65°	10	13	10	0	33
70°	9	13	7	1	30
75°	7	8	5	2	22
80°	3	3	7	3	16
85°	2	1	1	1	5
90°	0	0	1	1	2
Total	93	102	56	9	260
X =	57°	56°	67°	77°	
Median =	60°	55°	65°	80°	

* Note - Counts indicate the number of utilized edges, not numbers of flakes - one edge of one flake missing.

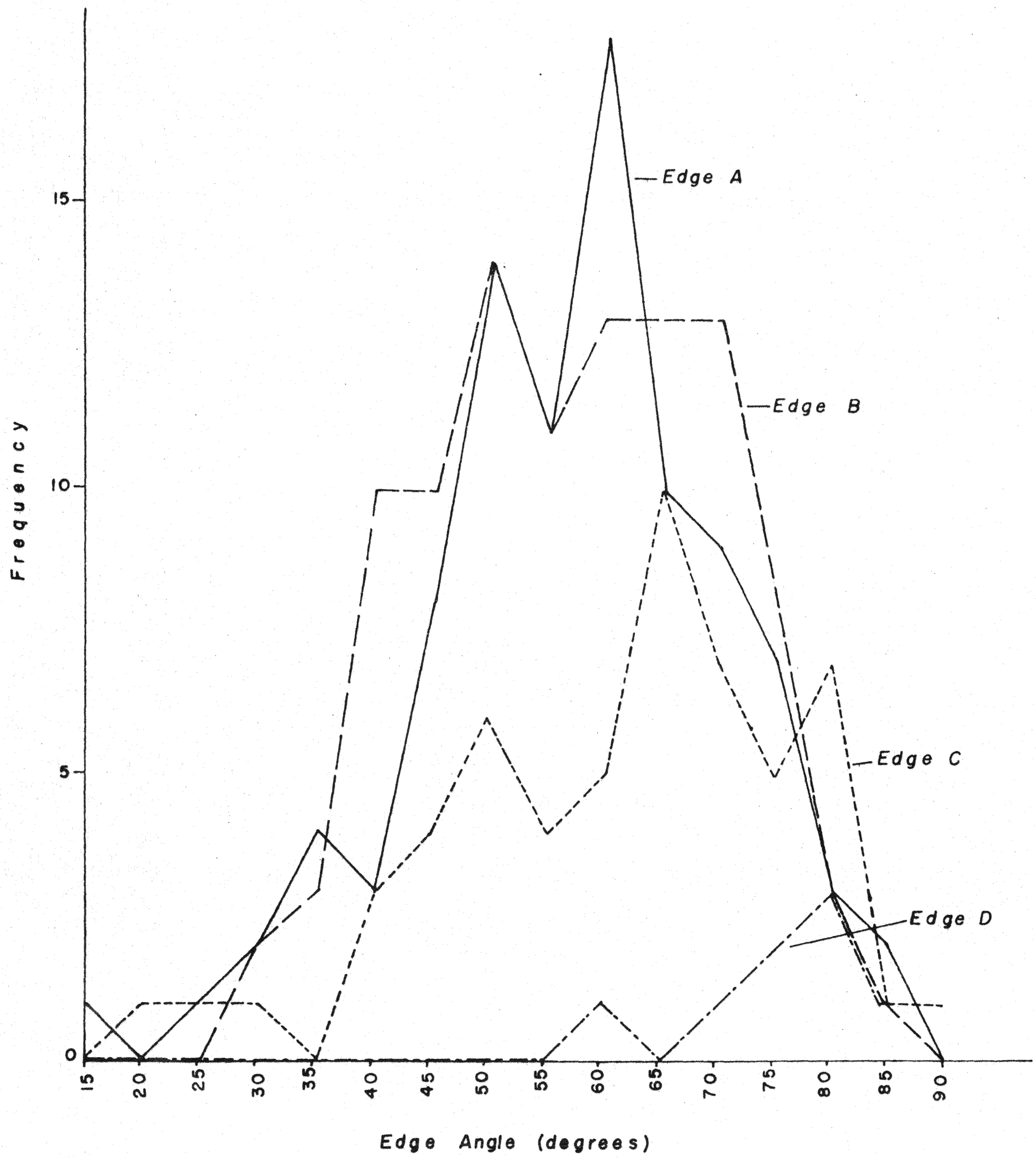

Figure 8. Edge Angle Distribution, Retouched and/or Utilized Flakes

examination of this distribution (graphed in Figure 8) indicates similar edge angles on utilized lateral margins, but somewhat steeper angles on distal ends, and even steeper edge angles on the nine utilized proximal ends.

Debitage

The remaining categories of chert artifacts are those normally considered as by-products of the manufacture of other chipped stone artifacts. They were either removed from another piece of chert during the course of manufacture of a tool or were the piece from which flakes were being removed. In either case, the specimen has not been further visibly modified.

Class 16 - Cores - 145 specimens -

Defining criteria - chert as raw material; large angular piece of chert, not bifacially or unifacially worked but, rather, flakes were taken from all surfaces.

Description - Cores fall more or less into two groups. One group consists of essentially cobbles or nodules with large amounts of cortex remaining. Some flakes have, however, been removed. No subsequent modification appears to have taken place. The other group of cores retains little or no cortex and generally has flakes removed all over. Some specimens appear to have had the platform prepared by removal of a large flake. The flat surface was then used as a striking platform for subsequent removal of flakes. On other specimens, removal of flakes seems to have been somewhat more haphazard.

Class 17 - Chert hammerstones - 2 specimens - Plate 31

Defining criteria - same as class 16 but with battering along one or more platform margins.

Description - both specimens made from cobble cores retaining much cortex and with only a few flakes removed. Battering is restricted to only a few angular margins and does not occur elsewhere on the cobble.

Class 18 - Shatter - 871 specimens -

Defining criteria - chert as raw material; angular pieces of chert, broken along more or less straight cleavage planes with no bulbs of percussion or striking platforms.

Description - Shatter is a by-product of the chipping process. When chert is struck, particularly in early stages of modification, a number of pieces may be knocked off. Some of these are not directly struck off but are rather dislodged by shock. These pieces retain no striking platform or bulb or percussion, either positive or negative. This class includes shatter of all sizes.

Class 19 - Cortex flakes - 78 specimens

Defining criteria - chert as raw material; unworked; retains a striking platform and bulb of percussion and/or rippling on the ventral face indicating it is the result of a direct blow; cortex covers the entire dorsal face.

Description - Cortex flakes in the present collection are of a variety of sizes. All, however, meet the criteria listed above.

Class 20 - Primary flakes - 108 specimens

Defining criteria - chert as raw material; unworked; retains a large flat striking platform and prominent bulb of percussion; length of force axis is over 50 mm.

Description - Primary flakes may or may not retain cortex. When they do, it does not cover the entire dorsal surface. Striking platforms may have a lip, probably derived from percussion with a hard hammer.

Class 21 Secondary flakes - 486 specimens

Defining criteria - chert as raw material; unworked; retains a large flat striking platform and prominent bulb of percussion; length of force axis is less than 50 mm.

Description - Secondary flakes rarely retain cortex and, when they do, it covers only a small portion of the dorsal surface. The striking platform may have a lip - probably derived from percussion with a hard hammer.

Class 22- Flakes from bifacial retouch - 1748 Specimens

Defining criteria - chert as raw material; unworked; striking platform and platform and bulb of percussion present, and/or ripples indicate their presence on a broken flake; no cortex.

Description - Striking platforms frequently are wide, having been torn from the edge of the biface. The flake itself is thin and has faceting on the dorsal face indicative of previous flake removals.

Ground Stone -

The last eight specimens, which are here placed in two classes, are characterized by not being made of chert. Raw material varies; some are of sandstone, others are of other coarse stone. Deep pitting is the major factor separating the two classes.

Class 23 - Nutting stone - 1 specimen

Defining criteria - Manufactured of rock other than chert; small hemispherical pit present on one surface.

Description - The present specimen is made of sandstone; one pit is present. The pitted surface shows little or no grinding.

Class 24 - Manos - 7 specimens

Defining criteria - Manufactured of rock other than chert; deep pit lacking.

Description - Small hand-held rocks, convexly smoothed on one or two faces. Edges may be rounded as in the six cases in which the artifact represents a whole cobble or, as in the seventh case, broken from a larger original piece of rock. Broad shallow pitting frequently occurs on manos but the only pitted example in the present sample seems to have been pitted from recent plow activity.

Table 8 shows the distribution of these classes of material, exclusive of points, listed by chronological type in an earlier table (Table 5). In this form, therefore, the contents of the sites can be employed in an analysis of artifact distributions and site locations.

3. Settlement Patterns

The preceeding two sections of this part (Part E) have concentrated on the descriptive presentation of the results of the Downstream Stockton survey in terms of: 1) the sites themselves and the conditions under which they were

Table 8

Distribution of Artifacts

	Hafted scraper	Biface-Class 3	Biface-Class 4	Biface-Class 5	Biface-Class 6	Biface-Class 7	Biface-Class 8	Biface-Class 9	Biface-Class 10	Biface-Class 11	Biface-Class 12	Miscellaneous bifaces	Scrapers	Retouched &/or utilized flakes	Cores	Hammerstones	Shatter	Cortex	Primary flakes	Secondary flakes	Tertiary flakes	Nutting stone	Mano
23CE16					1	1				2				2	1		9	1		2	20		
23CE42				1	2		1								4		40	5	3	14	27		
23CE51					2		1			1	1			1	2		23	1	3	9	14		
23CE52							1		1		1	1	1	2	3		31	4	3	7	29		
23CE222		1													1		4				5		
23CE223						2								2			6			1	5		
23CE224	1				1		3					1		10	4		16	1		24	33		
23CE225							2							2			2		1	6	15		
23CE226														6	1		11	3	15	11	10		
23CE227					4	1	7	1	1	3	5			4	14		100	6	16	45	407		1
23CE228					1		1	1			2	1		1	3		14			17	53		
23CE229	2	1	1	1	1	2	2	2		1	1	1	4	7	11		49	7	6	34	111		
23CE230										2				1	4		6		1	12			
23CE231													1	3	6	1	21			4	9		
23CE232				1										3	1		9			10	9		
23CE233				1	1									1	1		2	1		7	13		
23CE234		1					1				1	1		17	5		34	1	1	15	25		
23CE235			1	1	2		4	3		1	1	1	4	7	12		49	7	9	26	57		
23CE236							1					1	1	4	2		11		1	14	19		
23CE237				1	2		1		1	2	1	2	3	16	8		25	1	6	19	28		
23CE238				1					2		2			5			36		1	19	46		
23CE239																							
23CE240														3			8			1	13		
23CE241				1	2						1						17			13	40		1
23CE242											1			5			17			9	48		
23CE243					1						1			5	3		19			9	29	1	1
23CE244							1			2		1	1	1	5		7	1		1	8		
23CE245				1			1							8			23	5	2	10	33		

Table 8: Continued

Distribution of Artifacts

	Hafted scraper	Biface-Class 3	Biface-Class 4	Biface-Class 5	Biface-Class 6	Biface-Class 7	Biface-Class 8	Biface-Class 9	Biface-Class 10	Biface-Class 11	Biface-Class 12	Miscellaneous bifaces	Scrapers	Retouched &/or utilized flakes	Cores	Hammerstones	Shatter	Cortex	Primary flakes	Secondary flakes	Tertiary flakes	Nutting stone	Mano
23CE246														1	1		3			2	7		
23CE247															1		5			3	23		
23CE248														1			4				9		
23CE249							1							2	1		5	4		3	74		
23CE250				1		1				2				11	3		16	2	8	6	37		
23CE251							1		1		1			13	3		23	3	3	16	39		2
23CE252					1		1				1		1	5	4	1	23	2	1	9	46		
23CE253	1	2	1	4	7	3	15	2	2	15	3	2	2	30	26		87	7	11	47	124		1
23CE254															3		13			7	11		
23CE255		2		1	1	3	5		2	1					4		16	2	7	9	43		1
23CE256					1		1				1				2		12	2	3	8	6		
23CE258					1			1		1				5	5		67	12	3	29	160		
23CE259										1		1		1	1		3			4	7		
23CE260																	4			1	4		
23CE261							1										1		4	3	52		
23CE262														1									

surveyed, and 2) the collections made at each site. In this section, these two kinds of results are integrated in a discussion of settlement patterns in the Sac River bottoms.

The term settlement pattern can be taken to refer to "the geographic and physiographic relationships of a contemporaneous group of sites within a single culture" (Winters 1969:110). Although Winters (and others who have presented similar definitions) would discuss the settlement pattern from the point of view of a single "culture" or phase, in actual practice the term has been used to cover just about any distribution of sites - from a single phase (e.g., Winters 1969), through major periods (e.g., Johnson 1974, Roper 1975a), to sites of all periods considered at once (e.g., Gumerman, ed. 1971). While inferences are probably behaviorally most meaningful when made against as fine a temporal scale as possible, lack of means of chronological control below the period level obviously makes a discussion of settlement patterns in any finer sense impossible.

Explaining why the settlement pattern takes the form it does is another matter. Flannery (1976:162) calls the settlement system the set of rules that generates the settlement pattern; Winters (1969:110) refers to the settlement system as "the functional relationships among the sites contained within the settlement pattern". The settlement system should be considered as only one of several possible explanations for an observed site distribution when the investigator is working with gross time periods. More specifically we cannot always rule out change in settlement strategy during what we define as a period. Settlement system analysis must also be approached cautiously when dealing with a single environmental zone since we do not know if we are observing the physical remains of the entire settlement system, or only a part of that system. More than likely, it is only a part.

With these preliminary notions in mind, therefore, we shall proceed to a settlement pattern analysis of the Downstream Stockton survey area and shall suggest several possible explanations for the observed site distribution.

The technique employed here is "site catchment analysis" - an approach principally developed in European archeology, but also employed in the New World by this author (Roper 1974, 1975a) and others (e.g. Flannery, ed. 1976:91-130). The theoretical justification for this approach has been explained elsewhere (Roper 1975a, 1975b); suffice it to say here that if we conceive of the inhabitants of a site as interacting with that portion of their environment surrounding the site, and if we can assume reasonably rational economic behavior, then it follows that it is highly relevant to analyze the nature of the resources immediately surrounding the site rather than just the characteristics of the site itself. To do so, therefore, we can conceive of the site as the center of a circle of arbitrarily determined (but theoretically suggested) size and can analyze the resource contents of this readily accessible territory.

Analysis of the Downstream Stockton survey considered the locations of sites in relation to eight variables of the surrounding natural environment: width of floodplain; horizontal distance to water; amount of bottomland (in mi^2) within a one mile radius of the site; amount of bottomland within a one mile radius of the site but on the same side of the river; the same for a one half mile radius; amount of river (in mi) within one mile of the site; total amount of land (in mi^2) within one mile of the site but on the same side of the river; and distance to the bluff base. Some of these data are given in Table 2. All were measured with the appropriate instrument (engineer's rule, chartometer, or planimeter) from 7.5' U.S.G.S. quadrangle maps. The data were then analyzed using principal components analysis. Rather than discuss the mathematical solution of this analysis here, we will only discuss sites by major period. For those interested in more detail, Appendix C presents a fuller technical discussion of the analysis.

Dalton - The Dalton occupation of the Downstream Stockton Study area is represented in the 1976 survey by a single component which is known only from the small amount of material that has eroded from a vertical cut bank. It is obviously impossible to say anything substantial concerning the nature of the occupation. Further, given only a single known site and, given the lack of comparative literature on Dalton in southwest Missouri, it is impossible (and unwise) to say much about the settlement pattern. It would appear, however, that 23CE261 may have been well placed to exploit all major available microenvironments in the Sac River Valley. A great deal of bottomland falls within a one mile radius of the site, although much of it is on the other side of the river. There is also much upland on the same side of the river, plus long stretches of river within a one mile radius. This favorable combination is a result of the sites' position at the widest point of a wide-swinging loop of the river. How much the river has changed course in the millennia succeeding the Dalton occupation is of course unknown.

Middle Archaic - Six components (Figure 9) have been assigned to the Middle Archaic period. Site 23CE262 is discarded for settlement pattern analysis, however, because its position on a gravel bar is almost certainly the result of redeposition. Two of the other five sites, 23CE235 and

23CE237, show characteristics of being base camps. Both are single component sites so far as is currently known, although an unidentifiable point was collected from the surface of 23CE237. Both sites contain a large number and wide variety of bifaces; collectively they account for nearly one-third of the scrapers from the entire survey. Both sites show a high density of all kinds of debitage, including cores and primary flakes. A wide range of cutting, scraping, and manufacturing activities is therefore indicated.

23CE235 has a large amount of land on the same side of the river within a one mile catchment radius, much of which is bottomland. 23CE237 is farther from the bluff and has less land on the same side of the river, as well as a smaller amount of bottomland and longer stretch of the river within one mile of the site.

Although these two sites are therefore not exactly alike in their locations, they are more like one another than either is like 23CE242. This latter site is multicomponent, but it yielded a sparse amount of material, indicating a narrower range of activities than at the other two sites. The site is located on a wide floodplain in a broad loop of the river, and nearly surrounded by the river. The amount of land on the same side of the river within one mile is not great, but what there is is bottomland.

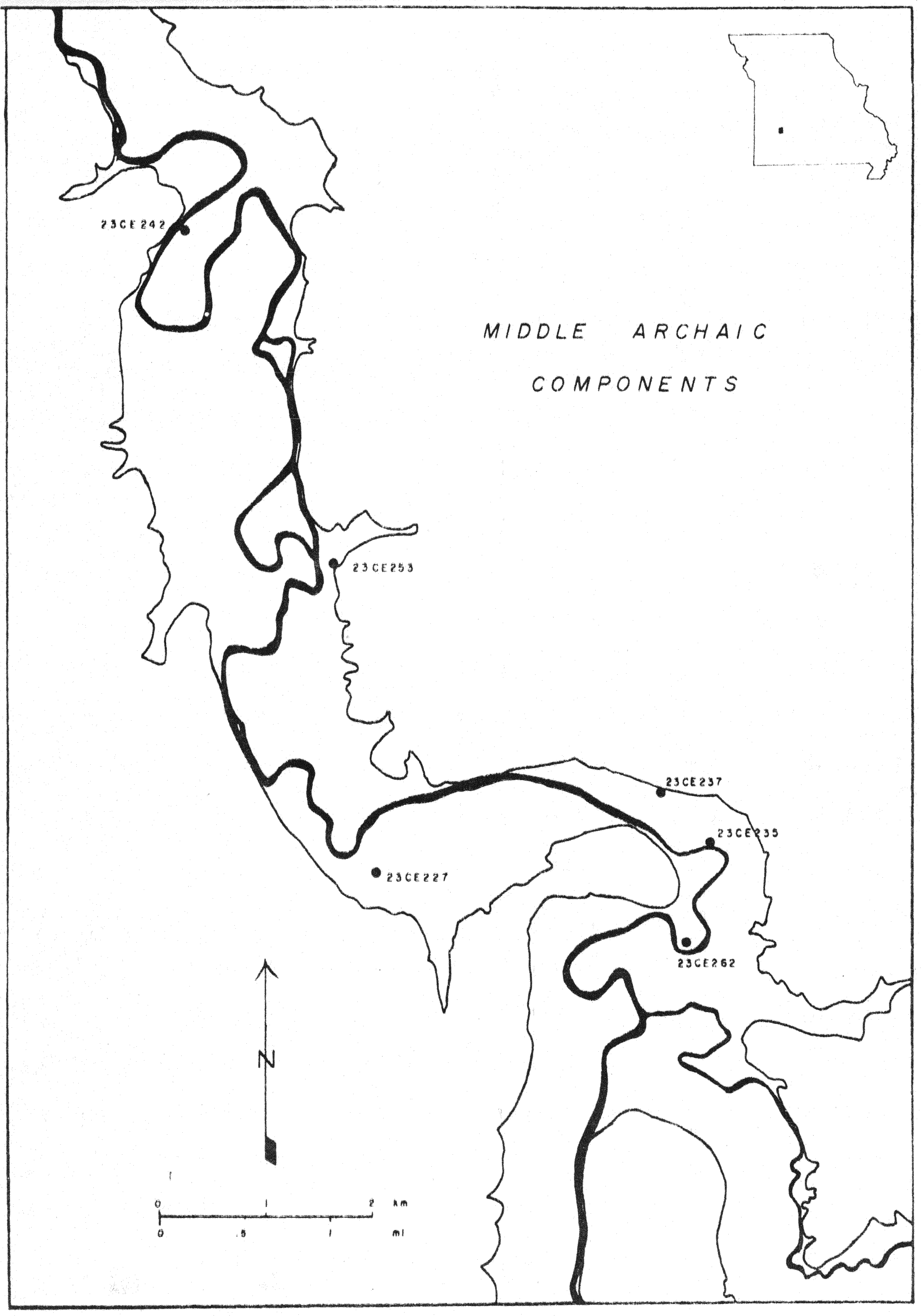

Figure 9. Distribution of Middle Archaic Components

The last two Middle Archaic components, 23CE227 and 23CE253, are more difficult to interpret. Both are large multicomponent sites containing Late Archaic and Woodland points as well as Middle Archaic specimens. Although a full gamut of activities similar to 23CE235 and 23CE237 is represented, it is impossible to tell what material, other than the points, is assignable to the Middle Archaic, and thus, obviously, to make inferences concerning the nature of the Middle Archaic occupation there. 23CE227 is, however, in a location similar to that of 23CE237, the major difference being that 23CE227 is further back from the river than is 23CE237. Similarly, 23CE253 is located in a position similar to that of 23CE235. The major difference between these two sites is that 23CE253 is at the base of a slope on a broad alluvial fan near a narrow stretch of floodplain, and therefore has access to far less bottomland within a one mile radius of the site (but on the same side of the river) than does 23CE235.

The impression of Middle Archaic settlement thus presented is one of base camps in the bottoms, with bottomland being the major resource zone immediately accessible within one mile of the site. This site type is represented by 23CE235, 23CE237, and perhaps by 23CE227 and 23CE253. The multicomponent nature of the latter two sites makes this identification of these sites uncertain, while the lesser amount of bottomland surrounding 23CE253 raises some problems with this interpretation. Nevertheless, we present it as a working hypothesis. 23CE242, even though also multicomponent, seems to represent a far narrower range of activities at any period and is even more oriented toward the floodplain and the river than are the other four Middle Archaic components.

Whether or not the base camps in the bottoms are the major habitation loci of the Middle Archaic period will not be known unless the uplands are also surveyed. However, we can present an environmental argument in favor of an interpretation of semi-permanent habitation at this period in this zone. As noted previously, (in Part C), the Middle Archaic is characterized by a warmer, drier climate than the preceeding and succeeding periods. As a result, we would expect that: 1) the river would flood less often and/or to lower elevations, and 2) the already open, prairie-covered uplands would expand while the forested bottomlands would probably remain more stable. At this time, an increasing use of animals of both the grasslands and the bottomlands is reflected at Rodgers Shelter (McMillan 1976: 228). During periods of such a shift in procurement emphasis, we might predict a corresponding shift in settlement strategy. This type of shift could easily account for the observed Middle Archaic site distribution in the Sac River Valley.

<u>Late Archaic</u> - In contrast to Middle Archaic settlement, the Late Archaic settlement pattern seems to reflect a clear dichotomy in site types and locations, and a shift, possibly in response to changing climatic conditions, in site distribution. Eight components (Figure 10) have been assigned to this period. Unquestionably, there are two kinds of locations. One, represented by 23CE242, 23CE243, 23CE248, and 23CE250, is located far from the bluff base, well out on a wide floodplain and, because of generally close proximity to the river, contains less than the average amount of land within one mile of the site on the same side of the river. In this position, these sites rarely include much upland within their one mile catchment (the exception is 23CE250), but do include varying amounts of bottomland, especially on the same side of the river, as well as varying lengths of the river within one mile.

Three of these four sites, 23CE242, 23CE243, and 23CE248, contain limited assemblages, even though two of them are multi-component (23CE242 and 23CE243). The fourth, 23CE250, possibly a single component site, reflects the whole manufacturing sequence in the debitage, although it has a rather small number of bifaces. In some respects, however, its assemblage is more like the single component site of the second type.

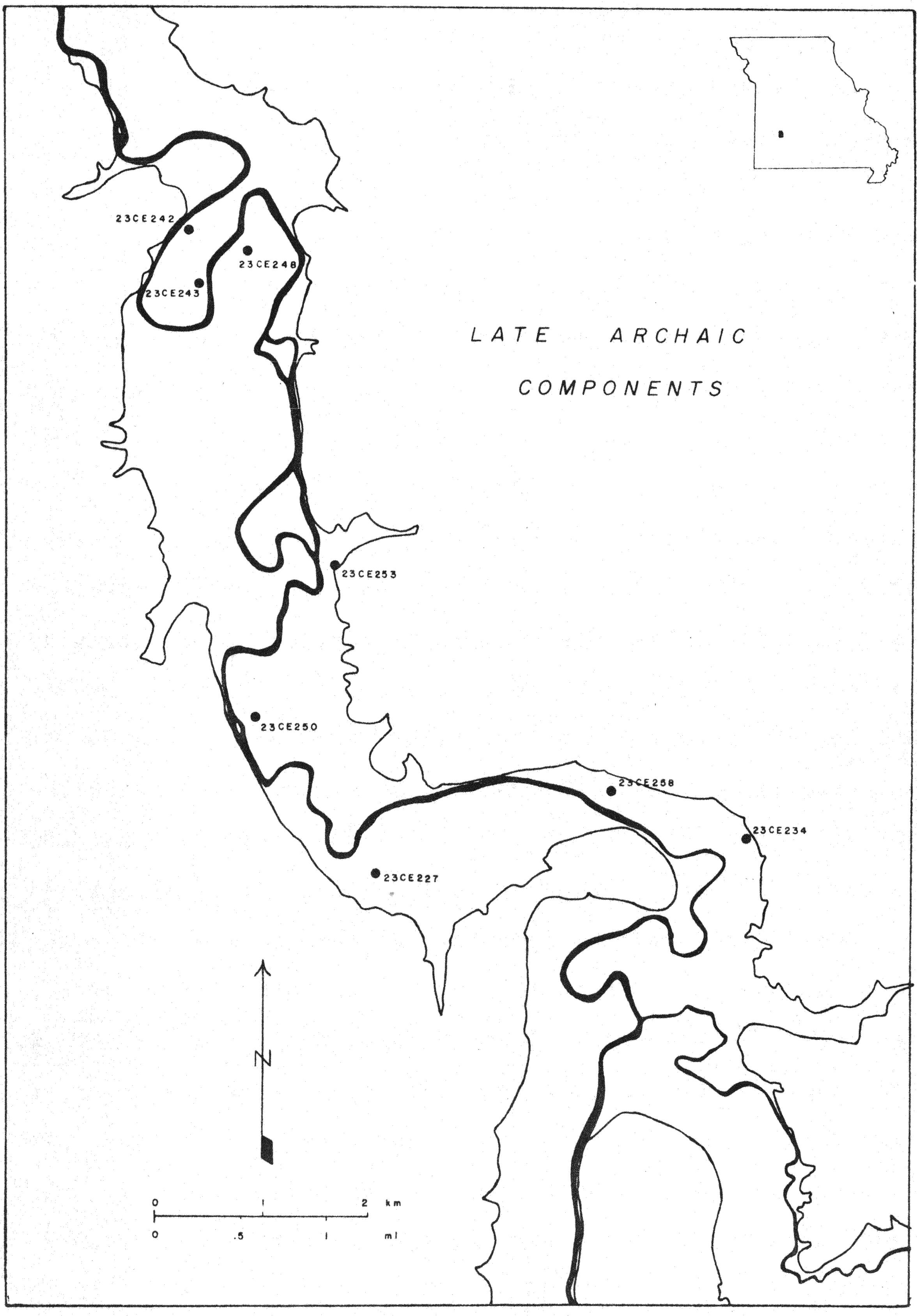

Figure 10. Distribution of Late Archaic Components

The second type of Late Archaic site may reflect a somewhat greater variety of activities. Unfortunately, three of these sites (23CE227, 23CE253, 23CE258) are multicomponent and it is therefore impossible to assign any tools except points to a specific time period. The fourth site, 23CE234, appears to be single component and yielded a number of bifaces and debitage representative of all stages of manufacture, although not necessarily in large quantity. In this respect, then, 23CE234 and 23CE250 are quite similar. Three of this second group of sites, 23CE234, 23CE253, and 23CE258, are locationally distinct from the first group of sites. These sites are placed at the back of the narrow floodplain, near the bluff base, in such a position that much of the land within a one mile radius of the site is on the same side of the river. At 23CE253 and 23CE258 in particular, however, the land on the same side of the river consists of rather small amounts of bottomland.

23CE227 is locationally intermediate between these two groups although closer to the second than the first group. This site has been mentioned before, in the discussion of Middle Archaic sites. Although this site is not well out in the floodplain, neither is it right at the bluff base. It is surrounded by more bottomland on the same side of the river than any of the other sites and, in this sense, as we have seen previously, fits the basic Middle Archaic pattern rather well.

In general, then, it would seem that position on the floodplain separates Late Archaic sites into two rather distinct groups - those at the bluff base and those nearer the river on a wide floodplain. Only a single site (23CE227) is in an intermediate position. Contents of sites show that, with one exception, the bluff base sites may reflect a somewhat wider range of activities than sites nearer the river. One site, 23CE250, is locationally more like the floodplain sites, but it is more like the bluff base sites.

We hesitate at this point to offer too firm an interpretation of the settlement system of the Late Archaic inhabitants of the Sac River bottoms. Surely the sites at the river edge of the floodplain represent limited activity sites. By this time, the climate should have changed to a somewhat cooler and/or wetter regime. Flooding patterns therefore should have been similar to those observed in the 20th Century prior to regulation by Stockton Dam, and could have rendered these sites uninhabitable for part of the year almost annually. Bluff base sites would have been more secure from flooding. Even so, because several sites are multicomponent and because the nature of the collections seems to indicate wider range of activities, (but without giving the impression of a base camp), we hesitate at this point to interpret these sites as anything but a different type of site.

If we accept the proposition that site placement and the resource base within a short radius of a site are correlated with the major resources being procured from the site, then it is easy to interpret the Late Archaic bluff base site locations as a possible return to a broader subsistence base, or at least one whose resource procurement strategy crossed several environmental zones. This would therefore clearly contrast with the Middle Archaic pattern that seems to feature an economic location in a position surrounded by large amounts of bottomland. Only further investigation of these sites, coupled with survey and excavation in the uplands, will help fit the Downstream Stockton Archaic sites into perspective.

Woodland -

We divide the Woodland sites into two groups, which are probably temporally sequential. The first group of sites yields points of the Langtry, Gary, and Rice Side-Notched types; the second group yields small points which could be called Scallorn, triangular, Cahokia, Young, and perhaps a variety of other names as well. Of 15 (Figure 11) sites from which points of all these types were collected, only a single site had specimens from both groups.

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Seven components are assigned to the larger point group: 23CE224, 23CE229, 23CE242, 23CE244, 23CE249, 23CE251, and 23CE255. Two of these sites, 23CE229 and 23CE255, stand out as possibly base camps or "villages". This assessment is made on the basis of the presence at both sites (but especially at 23CE229) of a large number and variety of tools and debris, representing a variety of cutting, scraping, processing, and manufacturing tasks. The surface inventory from 23CE229 and 23CE255 partially duplicates the excavated inventory at the Flycatcher and Dryocopus Woodland villages in Stockton Reservoir (Calabrese, et al. 1969, Kaplan, et al. 1967) and component B at the Infinity Site in the Elk City Reservoir of southeast Kansas (Marshall 1972). We suggest that the surface evidence from the two Downstream Stockton survey sites indicates their function was similar to that of these three excavated sites.

Both 23CE229 and 23CE255 are in remarkably similar locations. Both are in areas where the floodplain is neither particularly narrow nor particularly wide in relation to the width of this segment of the river valley. Again, relative to other sites considered in this report, these two Woodland sites have neither a large nor small amount of land within a one mile radius on the same side of the river, and neither a large nor small amount of bottomland on either side of the river. These results

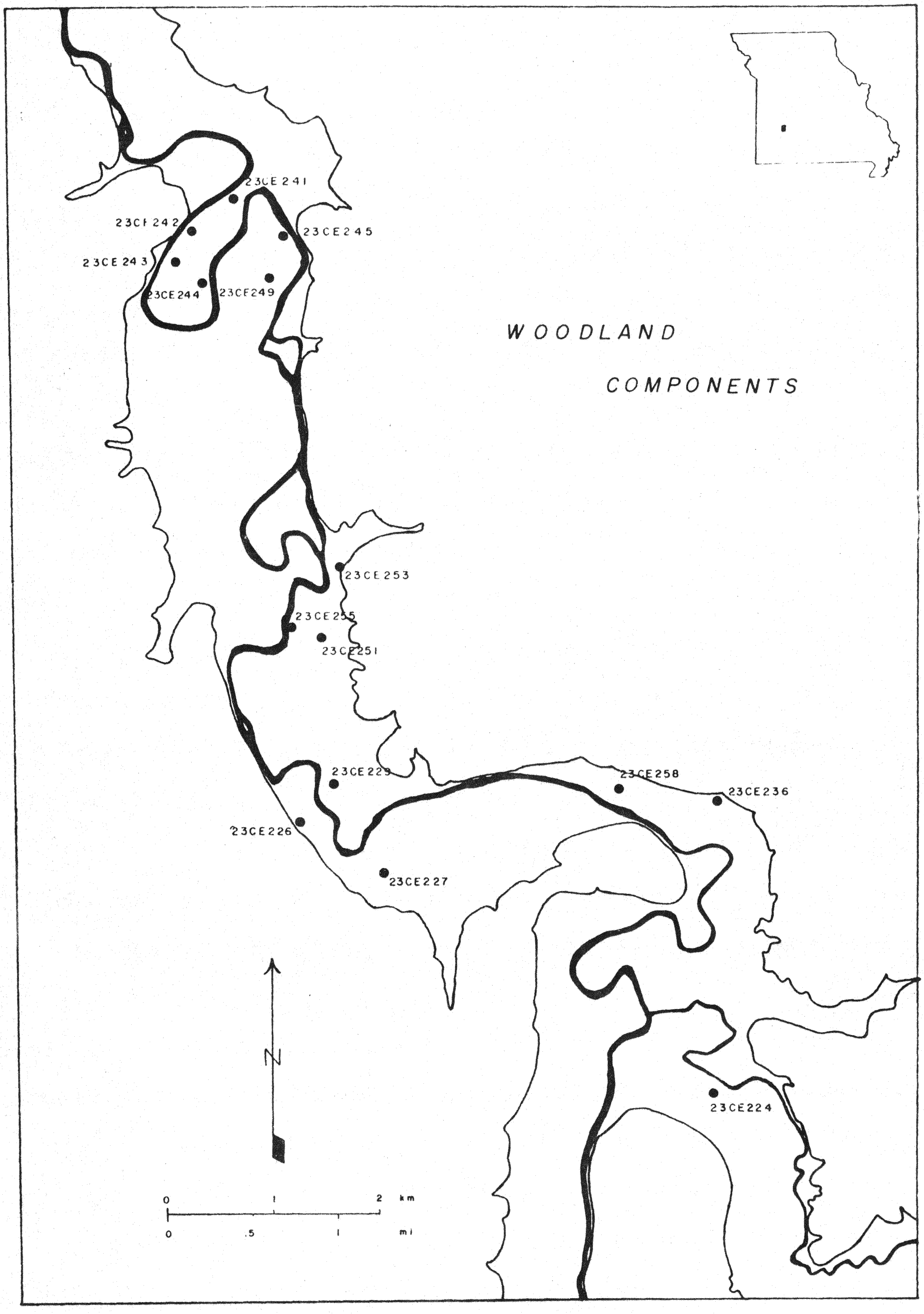

Figure 11. Distribution of Woodland Components

suggest that these sites' locations were optimal to several of the major environmental zones in the Sac River valley, combining ready access to resources of the river, the bottomlands, and the valley walls within the distance of a short walk from the site, without emphasizing any single resource. We have previously predicted (Roper 1975b:5) that such a semi-permanent camp may indeed have been in a location to maximize diversity of immediately available resources. This prediction is lent some support by the Downstream Stockton survey sites.

We should note also that 23CE229 and 23CE255 are in locations apparently similar to the Flycatcher, Dryocopus, and Infinity sites. The latter, however, were not subjected to the same kind of site location analysis as were the Downstream Stockton sites.

The remaining five sites assigned to this larger point group contain far more limited assemblages of material, having few broken biface fragments, perhaps a scraper, some utilized flakes, and varying quantities of debitage. The location of 23CE251 is in some ways similar to that of the two sites discussed above, but differs in that it has far less river within one mile of the site and is farther from the river. The remaining four sites, 23CE224, 23CE242, 23CE244, and 23CE249, show considerably more variation in their position on the floodplain. 23CE224 is in an area where the floodplain is narrower than average, although a large proportion of the land within one mile of the site is bottomland. The other three are all well out on a broad floodplain but are not necessarily surrounded by large amounts of floodplain, even on the same side of the river. This is probably due to the fact that they are within loops of river meanders.

The settlement system of the Woodland inhabitants, (makers of larger points such as Gary, Langtry, and Rice Side-Notched), therefore can be interpreted to include the establishment of small "villages" - hamlets might be a better term - on a floodplain or a low terrace near the river, and not too far from the forested valley walls. Culturally related to these hamlets are small special-purpose camps in various positions on the floodplain. Undoubtedly a survey of the bottomland portions of this segment of the Sac Valley which are not covered in this study, and of the adjacent valley walls and uplands, would reveal more such sites and help round out our knowledge of the settlement system of this Woodland occupation. Further, this settlement system undoubtedly can be duplicated elsewhere in the Sac River valley, and in other river valleys of southwestern Missouri and southeastern Kansas.

Nine Woodland sites, 23CE226, 23CE227, 23CE236, 23CE241, 23CE243, 23CE244, 23CE245, 23CE253, and 23CE258 yielded small points of a variety of named and unnamed types. These types are widespread in the Ozarks and Central Plains on a late prehistoric time level and are characteristic of a number of complexes. Thus, without ceramics to assist in cultural identification, we are unable to assign these sites any more precisely to known taxa.

These nine components are scattered in varying positions on the floodplain but seem to be either at the bluff base or well out on the floodplain. The most notable exception is 23CE227, a multicomponent site with a little of everything, whose location has been previously discussed (see Middle Archaic). However, with the exception of this site and 23CE241, no site has very much bottomland within a half mile or one mile radius on the same side of the river.

Four sites, 23CE227, 23CE243, 23CE253, and 23CE258, are known to be multicomponent; thus, although 23CE227 and 23CE253 have a large variety and quantity of materials, it is impossible to assign anything but points to any particular component. 23CE243 appears to be a small site at all time periods. 23CE258 cannot be judged at this point. Its area of scatter is large and, although the totals of any class of material (Table 8) are not large nor does the variety of activities represented seem particularly great, it must be remembered that this site was delineated <u>entirely</u>

by shovel testing in a field on which heavy grass cover totally obscured the surface.

The other five sites produced no diagnostic material other than Woodland, but none of them revealed large or diverse assemblages. Thus, no case can be made for <u>any</u> of these sites having been base camps or hamlets. Instead, at least six and perhaps all nine group 2 Woodland sites are small limited-activity sites. The Sac River floodplain thus reveals little information regarding the settlement system of late prehistoric southwestern Missouri except for the obvious observation that some use was made of the Sac River bottomlands. The functions of these sites, and their place in southwestern Missouri prehistory, is of considerable interest. Examination of Truman Reservoir collections is raising some interesting questions about the nature of the occupation of the Western Prairies of Missouri in the final centuries before historic Indian and Euro-American occupation. Specifically, the area appears to be culturally eclectic, with little evidence of permanent habitation by anyone. The Downstream Stockton collections do not contradict this interpretation. Hopefully, a comparison of these sites with similar sites from all types of topographic situations in the adjacent Truman Reservoir, as well as the greater Western Prairies, area will help shed some light on this question.

F. Summary and Conclusions

The preceeding report has emphasized the dynamics of the prehistoric occupation of the Sac River bottoms. To do so, we have delineated a series of periods of occupation and have attempted to identify that portion of the settlement system of each period contained within the river bottoms. It was emphasized at the outset, however, that the total use of the bottoms is not represented, nor is the archeology of the bottoms placed in perspective. Nevertheless, we are able to come to some firm conclusions:

1. Man has occupied the Sac River valley at least since Dalton times (ca. 10,500 to 8500 years ago). Further, the occupation has been more or less continuous during this time. Dalton, Middle Archaic, Late Archaic, and Woodland are all represented in the survey collections by identifiable points.

2. During the 10 millenia of prehistoric occupation, the manner in which the river bottomlands have been occupied has varied. Although we know the bottoms were occupied in Dalton times, we do not know much about that occupation. During the Middle Archaic period, base camps were established in the bottoms, probably for the purpose of exploiting bottomland resources. Related to these camps were small limited-activity sites next to the river. During the Late Archaic period two kinds of sites, possibly both

limited-activity, were located in the bottoms; one type of site was near the river, the other was at bluff base. During at least a portion of the Woodland period, however, larger base camps or hamlets were established in the river bottoms. It is suggested that these hamlets are identical in function to sites excavated in the Stockton Reservoir area elsewhere in the western prairies. Related to these sites are limited-activity sites on the floodplain. In late prehistoric times, however, the archeological remains do not give the impression of any permanent sort of occupation. This finding is, however, consistent with findings in the Truman Reservoir immediately to the north.

3. Other sites are almost certainly buried within Holocene alluvial deposits in the river bottoms.

4. Surface survey is most efficiently carried out in the spring when the ground is frequently unobscured and has been well rain-washed.

5. Settlement pattern analysis can indeed be fruitfully carried out within a single topographic zone. The use of site catchment analysis for this purpose made possible a delineation of various types of situations in which bottomland sites are found. These types of situations, when compared with chronological and functional assessments of the sites, resulted in a general model of changing

settlement configurations within a single environmental zone.

G. Recommendations

1. Survey

We have emphasized that our survey was primarily a surface survey exploring for buried sites only in those places where they were being exposed by cutting action. We feel that unless a buried site is being eroded, flooding is not having a negative impact on the site. Rapid bank slumping is occurring at two places along the river, however. In view of the drastic erosion occurring at both localities, and because of the known exposure of at least one site, it is recommended, that unless the banks are stabilized in these areas, they be checked at least monthly for newly exposed sites.

If cutoffs are constructed, it is recommended that systematic coring and/or trenching be undertaken to search for buried sites in the areas to be affected. Such cutoffs would probably be cut through areas of rapid alluvial deposition and could be considered likely areas to find buried sites.

2. Mitigation

The most urgent need for mitigation in the Downstream Stockton area is in those places where erosion and bank cutting are having a direct negative impact on sites. This is particularly true at site 23CE261, the only known Dalton component in the area. The site is currently undergoing rapid erosion by bank slumpage. The site vicinity was visited several times over the course of a two month period between its first recording and the preparation of the initial draft of the present report. Fresh slumpage was always apparent, as were new exposures of cultural debris.

The importance of this site for understanding the earliest occupations of the Sac River basin cannot be underestimated. Although the survey reported here collected only a single Dalton point, one other broken biface, and 60 pieces of debitage, the very small test excavation reported in Appendix D by Donohue, Danielsons, and Miller indicates the potential of the site for contributing information on the Dalton period. Further, at the time this test was being carried out, contact was made with a collector from Springfield, Missouri who has a large collection of Dalton and other early point forms from the site. He has indicated that cultural material has been gathered for several hundred yards along the outside of one of the current Sac River meander loops, and his constant monitoring of the site indicates that bank cutting and site destruction are proceeding rapidly. The rapid bank cutting action has also been noted by the current landowner.

Chapman's (1975) synthesis of Missouri archeology was cited earlier (p. 21) as suggesting that little use was made of the Western Prairie by Dalton period hunters. The presence of large quantities of Dalton period materials at 23CE261 suggests the contrary, but does not reverse the observation that reported components are scarce. No Dalton components, save those at Rodgers Shelter in the adjacent Ozark Highland, have been investigated in western Missouri. The Dalton remains at Rodgers Shelter are interpreted (McMillan 1976: 223-224) as remains of ephemeral campsites occupied only for a few days. McMillan (1976: 224) concludes, however, that "we simply do not know how other components in the overall Dalton settlement system in western Missouri may have compared with or complemented the manifestations at Rodgers Shelter." Although site 23CE261 is, like Rodgers, a bottomland site, buried in a Holocene terrace that was probably built rapidly, its setting also contrasts with that at Rodgers. It is an open site, set well away from any place of natural protection. Although we did not have the data to assess its biotic resource potential catchment, it is obvious that the streamside setting (.2 mi from the bluff-base) sharply contrasts with the bluff-base setting at Rodgers. The implications for activity distribution are unknown. Yet it is the investigation of sites in differing types of environmental settings that will enable us to model the structure of prehistoric settlement systems, and to specify how these systems interacted with their natural environments. We believe that 23CE261 has the potential to inform us concerning this problem; in fact, its nearly unique occurrence suggests that it may be vital to a fuller understanding of the Dalton settlement system in western Missouri. We therefore most urgently recommend:

1. Nomination to the National Register of Historic Places.
2. Immediate test excavation to determine the horizontal extent of the site.
3. If warranted, intensive excavation of the site.

A second site, 23CE235, is also endangered by slumpage. Although the site was not eroding into the river at the time of survey in April 1976, erosion in the near future will certainly damage the site. The quantity and diversity of artifacts from the site, and the presence of diagnostic Middle Archaic material suggest a base camp occupied sometime during the Middle Archaic period. Extensive excavations at Rodgers Shelter in the Pomme de Terre Valley have investigated an intensive Middle Archaic occupation at that site (McMillan 1976: 108). Other components of this period have been investigated but are minor occupations, most of them in rockshelters, and principally in the Ozark Highland. The study of both faunal remains (McMillan 1976) and sediments (Ahler 1976) at Rodgers Shelter suggests a reduction in forest surrounding the site during a period coincident with the Middle Archaic. If such a shift was occurring in the Ozark Highland, it should have been even more dramatic in the Western Prairie Region. Although we do know that there were occupations possibly contemporaneous with the Middle Archaic at Rodgers in the Western Prairie (McMillan 1968: 7), as yet we know very little about these occupations. Understanding the implications of the Middle Archaic climatic shift in the central Osage Basin will require investigaitons of contemporaneous sites in both the Ozark Highland and the Western Prairie Region. The opportunity for studying known components in Stockton Lake is already lost. We are of the opinion that if 23CE235 is indeed the Middle Archaic component it appears to be on the basis of our survey, it potentially contains information important for helping understand a poorly known period in western Missouri prehistory. The implications for understanding the nature of adaptations to pronounced climatic shifts are also great. At the present time, 23CE235 is apparently intact but is near the rapidly eroding bank. It is therefore recommended that this site be tested within the next year or two, before destruction occurs.

These two sites are the only ones currently directly threatened by power releases. However, the construction of Cutoff No. 4 would directly impact four other sites: 23CE240, 23CE241, 23CE242, and 23CE252. 23CE240 is directly in the channel cutoff area; the other three are in "temporary work area easement (waste spoil)" areas connected with this cutoff. All appear from our survey to have been "limited-activity" sites. As we have noted, however, understanding the function of such sites is important to understanding the nature of prehistoric settlement systems. It is precisely because of this fact and the fact that so few of these sites have been investigated that the information potential is high. We therefore recommend mitigation measures at these sites if Channel Cuttoff No. 4 is constructed. Such investigations need not be extensive. If these are indeed limited-activity sites, they should have little depth. We suggest that adequate mitigation might consist of a controlled intensive surface collection coupled with limited excavation to check for depth and subsurface features.

Appendix A

Glossary

Base - The proximal edge of an artifact, especially a point.

Biface - Any chipped stone tool or fragment thereof exhibiting chipping and/or retouch extending onto both faces and lacking any obvious provision for hafting.

Bulb of percussion - "The remnant of a cone part, the result of the application of either pressure or percussion force" (Crabtree 1972:48); the hemi-conical bulge on the ventral surface of the proximal end of the flake.

Flute - A channel flake removed for part of the vertical length of the surface of an artifact (cf. Crabtree 1972:66); is especially characteristic of Paleo-Indian points.

Haft element - The portion of a tool exhibiting some facility, e.g. notching, constriction, and/or grinding, differentiating it from the working portion of a tool and allowing it to be fastened to a handle or shaft (cf. Ahler and McMillan 1976:165).

Monadnock - "A hill left as a residual of erosion, standing above the level of a peneplain" (Leet and Judson 1965: 390).

Notch - An indentation in the side, corner, and/or base of a point made to facilitate hafting.

Point - "Any bifacially flaked, bilaterally symmetrical chipped stone artifact exhibiting a point of juncture on one end and some facility for hafting on the opposite end" (Ahler and McMillan 1976:165).

Shovel testing - The excavation of small test holes, about the width and depth of a shovel blade, to look for cultural remains; used in areas of heavy ground cover where detection of cultural remains is difficult.

Striking platform - The surface area of a core or artifact in progress, struck to detach a flake; the remnant of this surface retained on the flake (cf. Crabtree 1972:84).

Transverse fracture - A break in an artifact, parallel or approximately parallel to the base; i.e. a break running from lateral margin to lateral margin.

Appendix B

Analysis of surface collected historic artifacts from 23CE253

by

Russell LeRoy Miller

The following is an analysis of surface collected historic materials (22 glass fragments, 20 ceramic sherds and 4 metal objects) representing the cultural remains of those who inhabited site 23CE253 during historic periods.

Catalogue No.

23CE253-A

sur#47 Glass: One soda type glass, blown-in-mold, tumbler fragment.

sur#55 Ceramics: Two undecorated white ware sherds; two undecorated molded ironstone sherds; two undecorated grey stoneware sherds.

sur#56 Glass: One soda type glass, pressed pattern-molded goblet stem base fragment.

Metal: One hand forged iron rein ring; one cast iron stove leg fragment; one machine-cut iron nail, size 9d; one brass Winchester rim fire .22 long caliber cartridge case.

sur#57 Glass: Two artificially colored, opaque white, canning jar liner fragments; one modern amber beer bottle fragment; one resolidified blob fragment; and three lime type glass fragments.

sur#58 Glass: One resolidified soda type glass rim and one resolidified amber fragment; one light green, blown-in-mold canning jar base fragment; one soda type glass neck and rim with tool applied lip; one artificially colored amethyst neck fragment and five artificially colored opaque white canning jar liner fragments.

sur#59 Ceramics: Two molded blue enameled creamware sherds; one undecorated whiteware sherd with unidentifiable backmark; one flow blue whiteware sherd; one undecorated molded ironstone sherd; one ironstone molded cup handle sherd with gold gilting; and two undecorated gray stoneware sherds.

sur#62 Ceramics: One Albany slip glazed brownware sherd; and four undecorated gray stoneware sherds.

23CE253-b Glass: one clear glass body fragment, machine made, with embossed "ERY" lettering.

23CE253-D

sur#53 Glass: One resolidified soda type glass fragment.

sur #54 Ceramics: One molded blue enameled creamware sherd.

sur#55 Glass: one colorless lead glass, pressed pattern-molded fragment.

sur#56 Glass: One amethyst-tinted lead glass, pressed pattern-molded fragment.

An analysis of these artifacts should properly include an attempt to establish a time range for the site, as well as a indicators of cultural change which may have taken place during its occupations. However, these goals are infeasible, considering the small surface collection available as a data base.

The only assumption that may be made is for the age of the site. Examining the changes in technological development, the time of manufacture, and the time-distance relationship necessary for the product to arrive on the site, indicate a habitation period somewhere between A.D. 1840 and 1920.

Appendix C

The Site Catchment Analysis of The Downstream Stockton Sites

The rationale for the use of site catchment analysis has been briefly mentioned in Part E, Section 3, and more fully explained, with examples, in references cited in that section. Data derived from a principal components analysis of the 44 sites discussed in this report were used in the discussion of settlement patterns in the same section of this report. For those interested in more detail, and in order to accurately document the background information used in the settlement pattern discussion, the present appendix reports more detail on the analysis of the sites.

Since it is varying quantities or combinations of resources immediately accessible to a site's inhabitants that are thought to be important in site location, it has seemed appropriate to analyze site catchment data in a manner accounting for this interaction of variables. Principal components analysis has therefore been selected as a technique for non-redundant description of the major dimensions of variation among the sites, considering all measured site location variables at once. The reader unfamiliar with principal components analysis is referred to a brief, concise introduction to the subject by Davis (1973:473-533) or to the comprehensive text on all techniques of factor analysis by Rummel (1970).

The analysis for this report employed the factor analysis program contained in the Statistical Package for the Social Sciences (SPSS; Nie, et al. 1975). Factor option PA1, principal components analysis, was selected. All factors with eigenvalues greater than 1.0 were varimax rotated. Using this criterion, three components, which collectively accounted for 83.4% of the variance were rotated. Varimax rotated loadings are presented in Table 9, while the factor scores for each variable on each factor are given in Table 10. They have been ordered on each factor in order to help visualize their distribution. Tables 11 through 13 extract the factor scores of the sites assigned to each time period. Although it is the table of all factor scores that is used in basic interpretation of the analysis, it is these individual tables that are used to help interpret the settlement pattern of the sites assigned to any single period. Inspection of these tables further helps in interpretation of patterns of change and stability.

Factor I by itself accounts for 45.4% of the variance in the data. It is a bipolar factor, in which the width of the floodplain and the distance to the bluff base are in opposition to the amount of land within one mile of the site

Table 9.

Varimax Rotated Factor Loadings

	I	II	III	h^2
Floodplain width	.93	-.06	.27	.93
Horz. dist. to water	.11	-.75	.19	.61
Btm. within 1 mi.	.37	.84	.19	.88
Btm. 1 mi, same side	.12	.18	.91	.87
Btm. 1/2 mi, same side	.09	-.18	.87	.80
River within 1 mi.	.49	.76	.10	.83
Land, 1 mi, same side	-.79	-.42	.24	.86
Dist. to bluff base	.89	.21	.21	.89
% unrotated variance	45.4	23.7	14.2	

Table 10.

Varimax Rotated Factor Scores.

I		II		III	
CE244	2.51	CE238	1.76	CE239	2.12
CE243	1.88	CE262	1.74	CE238	1.96
CE52	1.84	CE239	1.58	CE240	1.65
CE245	1.71	CE261	1.47	CE222	1.40
CE249	1.59	CE16	1.33	CE261	1.39
CE247	1.21	CE233	1.24	CE235	1.32
CE250	1.14	CE224	1.19	CE223	1.29
CE242	1.10	CE51	1.14	CE241	1.14
CE42	1.07	CE241	0.75	CE232	1.04
CE248	1.01	CE242	0.75	CE42	1.00
CE246	0.96	CE260	0.75	CE224	0.63
CE262	0.31	CE253	0.61	CE227	0.53
CE241	0.23	CE259	0.45	CE250	0.39
CE222	0.16	CE252	0.44	CE259	0.38
CE260	0.10	CE246	0.43	CE249	0.36
CE230	0.04	CE52	0.42	CE242	0.31
CE228	0.02	CE240	0.41	CE234	0.30
CE238	0.02	CE248	0.31	CE228	0.28

CE240	-0.09	CE255	0.17	CE256	0.02
CE251	-0.11	CE249	0.09	CE229	-0.08
CE227	-0.11	CE254	0.09	CE254	-0.09
CE223	-0.11	CE245	0.08	CE255	-0.09
CE254	-0.15	CE247	0.04	CE248	-0.17
CE255	-0.26	CE235	-0.02	CE236	-0.21
CE232	-0.29	CE231	-0.16	CE237	-0.29
CE239	-0.30	CE256	-0.19	CE52	-0.36
CE16	-0.33	CE244	-0.30	CE260	-0.40
CE256	-0.35	CE258	-0.31	CE16	-0.50
CE224	-0.45	CE223	-0.33	CE225	-0.58
CE236	-0.51	CE229	-0.33	CE243	-0.59
CE237	-0.52	CE228	-0.58	CE247	-0.60
CE231	-0.55	CE230	-0.68	CE244	-0.67
CE258	-0.73	CE226	-0.78	CE230	-0.67
CE226	-0.79	CE42	-0.84	CE231	-0.67
CE233	-1.01	CE222	-0.88	CE252	-0.70
CE234	-1.02	CE250	-0.96	CE246	-0.73
CE51	-1.06	CE251	-1.08	CE51	-1.09
CE225	-1.12	CE225	-1.28	CE245	-1.14
CE235	-1.17	CE232	-1.28	CE262	-1.28
CE261	-1.21	CE237	-1.69	CE226	-1.32
CE252	-1.29	CE234	-1.81	CE258	-1.42
CE253	-1.42	CE236	-1.98	CE253	-1.77
CE259	-1.85	CE227	-2.04	CE233	-2.16

Table 11.

Factor Scores for Middle Archaic Sites

I		II		III	
23CE242	1.10	23CE262*	1.74	23CE235	1.32
23CE262*	0.31	23CE242	0.75	23CE227	0.53
23CE227	-0.11	23CE253	0.61	23CE242	0.31
23CE237	-0.52	23CE235	-0.02	23CE237	-0.29
23CE235	-1.17	23CE237	-1.69	23CE262*	-1.28
23CE253	-1.42	23CE227	-2.04	23CE253	-1.77

*23CE262 is probably redeposited material and thus is discarded in interpretation of the analysis

Table 12.

Factor Scores for Late Archaic Sites

I		II		III	
23CE243	1.88	23CE242	0.75	23CE227	0.53
23CE250	1.14	23CE253	0.61	23CE250	0.39
23CE242	1.10	23CE248	0.31	23CE242	0.31
23CE248	1.01	23CE243	0.28	23CE234	0.30
23CE227	-0.11	23CE258	-0.31	23CE248	-0.17
23CE258	-0.73	23CE250	-0.96	23CE243	-0.59
23CE234	-1.02	23CE234	-1.81	23CE258	-1.42
23CE253	-1.42	23CE227	-2.04	23CE253	-1.77

Table 13.

Factor Scores for Woodland Sites

I		II		III	
23CE244	2.51	23CE224	1.19	23CE241	1.14
23CE243	1.88	23CE241	0.75	23CE224	0.63
23CE245	1.71	23CE242	0.75	23CE227	0.53
23CE249	1.59	23CE253	0.61	23CE249	0.36
23CE242	1.10	23CE243	0.28	23CE242	0.31
23CE241	0.23	23CE255	0.17	23CE251	0.10
23CE229	-0.09	23CE249	0.09	23CE229	-0.08
23CE251	-0.11	23CE245	0.08	23CE255	-0.09
23CE227	-0.11	23CE244	-0.30	23CE236	-0.21
23CE255	-0.26	23CE258	-0.31	23CE243	-0.59
23CE224	-0.45	23CE229	-0.33	23CE244	-0.67
23CE236	-0.51	23CE226	-0.78	23CE245	-1.14
23CE258	-0.73	23CE251	-1.08	23CE226	-1.32
23CE226	-0.79	23CE236	-1.98	23CE258	-1.42
23CE253	-1.42	23CE227	-2.04	23CE253	-1.77

on the same side of the river. In other words, in considering a site's one mile catchment, as the width of the floodplain and/or the distance to the bluff increases, the amount of land within one mile of the site on the same side of the river decreases and vice versa. This situation is shown quite clearly by examining the factor scores for this factor and comparing these scores with the visual impressions gained from an examination of the general map of all sites considered in this report (Figure 6). A group of sites, 23CE244 to 23CE246 in the first column of the table of factor scores (Table 10), can be seen to be well away from the bluff. In part because of the large meander loops the river is making near these sites, these sites have the least amount of land within one mile of the site on the same side of the river of any sites in the analysis. Conversely, sites such as 23CE259, scoring on the other end of this component, have large amounts of land within one mile on the same side of the river but are near narrow floodplains and/or the bluff base. A dichotomy of sites on this factor is very clear among Late Archaic sites (Table 12).

Factor II accounts for 23.7% of the variance. This factor also is bipolar, where amount of bottomland within one mile of a site and/or the linear mileage of river within one mile of the site acts opposite the horizontal distance to the river. (Note: In all cases, either the Sac River or

Bear Creek was actually the closest watersource to the site. Therefore, horizontal distance to the river is also horizontal to water. Both the Sac River and Bear Creek are considered as "river" in this analysis.) In other words, as the amount of bottomland within one mile of the site and/or the linear mileage of river increases, the horizontal distance to the river decreases, and vice versa. Note also in both this and Factor I that amount of land within one mile on the same side of the river and amount of river within one mile tend somewhat to vary opposite one another. Note also that horizontal distance to water, which has its highest loading on this factor, has a communality quite a bit lower than that of any other variable (.61). This means that we can explain much less of the variation in this variable by its correlation with other variables than we can for other variables. One might suggest, however, that a shift in the position of the river channel since the time of occupation of the site would affect this variable more drastically than the others.

Factor III accounts for 14.2% of the variance in the data. The amount of bottomland within one mile of the site but on the same side of the river, and the amount of bottomland within a half mile of the site but on the same side of the river, both have high positive loadings on this factor. Sites such as 23CE239 and 23CE238 would therefore have most ready access to large amounts of bottomland on the same side of the river while a site such as 23CE233 would have the least. Note that since this is not a bipolar factor as are factors I and II, no single variable in partiular decreases as amount of bottomland on the same side of the river increases. It is unfortunate, however, that those sites with the highest scores on this factor are not ones that produced temporally diagnostic material.

Position on the floodplain would thus seem to be an important variable in site placement. This fact in itself should serve to caution those who would discuss settlement patterns from the point of view of site distribution within whole environmental zones. We have seen that it is possible to distinguish several site types <u>within</u> the bottomlands, and have observed and been able to account for changing patterns of bottomland settlement. This would not have been possible with a more conventional approach. The validity of these types must, of course, be established through further research.

However, while important, position on the floodplain is not everything. The river meanders from valley wall to valley wall and sites can occur on either side of the river and at any place along it. Thus access to bottomland on the same side of the river varies. Furthermore, the valley is not always of equal width either and therefore the amount of bottomland within one mile, on side of the river, also varies. Both these factors are somewhat less important in site location.

The best use of the factor analysis would be to further make use of the scores to delineate types of site locations. Although cluster analysis of all sites is sometimes useful in delineating groups of sites (see e.g. Roper 1974, 1975a), in the present case the results of a cluster analysis using two standard clustering techniques were very inconclusive. In view of the possibility of change over time in site location patterns, however, it would seem more reasonable to work with scores from each time period separately (Tables 11 through 13) and examine their distribution. In this manner, we would hope to be able to delimit and account for changing settlement patterns in the Sac River bottoms. It is analysis at this level that led to the interpretation of settlement patterns presented in the text of this report. It is suggested that the inclusion of too much time serves merely to confuse the analysis. While analysis of all sites did permit direct comparisons and an interpretation of temporal change, formulation of settlement patterns statements is best done on as fine a temporal scale as possible.

Appendix D

Test Excavations at 23CE261

by

James A. Donohue, Andris A. Danielsons, and Michael V. Miller

Because the survey of 23CE261 and the cut bank immediately adjacent to it indicated a rapid disappearance of this site, and because the matrix of the flakes showed strong soil development, suggesting a great age, it was felt appropriate to conduct limited test excavations to: 1) clean a soil profile for description, and 2) determine if cultural materials remain _in situ_. Accordingly, on July 30,31, and August 1, a 1.5 x 1 m test profile was excavated into the bank to a depth of approximately 4 m below the surface. Culturally sterile overburden was removed by shovel, and the levels containing cultural materials were trowelled in 10 cm levels.

The only cultural material recovered was debitage. A total of 353 flakes and flake fragments were recovered. All are made of white, probably Burlington, chert - the same as all flakes eroding from the bank collected during the survey. The Dalton point collected from the locality in

June is also of Burlington chert. The flakes from the test excavation are classified using the same categories as the survey material. A tabulation of each of these types of flakes, by level, is given in Table 14 (showing only those levels with cultural material).

The soil profile, as mapped and described by Miller, soils geomorphology graduate student at the University of Illinois, is summarized in Figure 12, while the distribution of flakes is shown in Figure 13. A comparison of the two illustrations shows that the majority of the cultural material is in the upper portion of the C horizon of the soil profile. Since the C horizon of a soil profile is the parent material for the overlying soil, the amount and structure of the soil overlying the cultural material suggests that the archeological deposits are <u>in situ</u> and of advanced age.

This limited test, amounting primarily to a larger-than-normal soil profile cut, demonstrates that at least part of the site still remains and that debris density is high. Even though no culturally diagnostic material was recovered, the association of the debris in the soil profile, the strong developement of the soil, the Dalton point, and the statement by a collector that he has 80 Dalton and related points from this locality, all argue for an early date for the material. The limited nature of the test excavation,

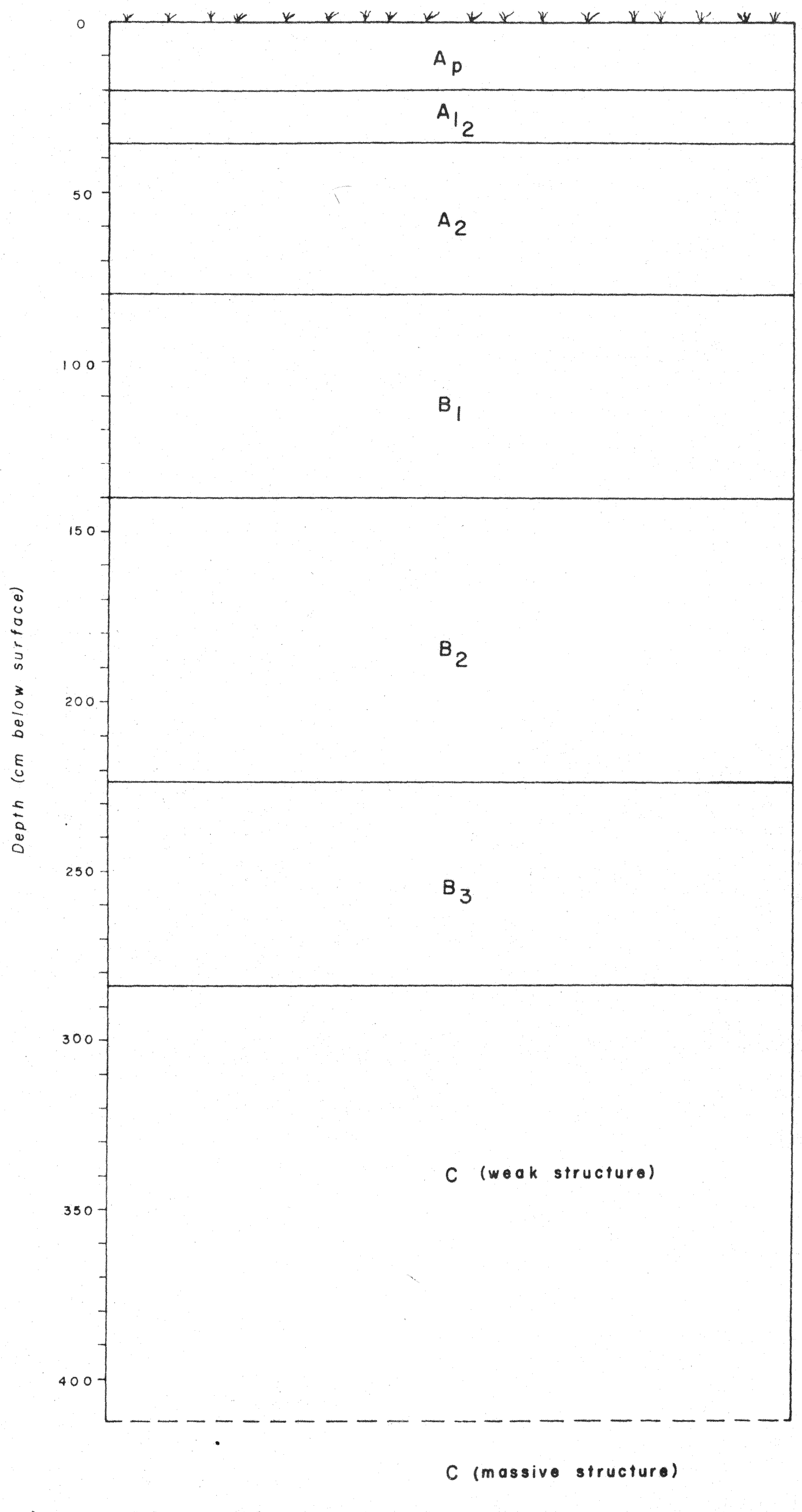

Figure 12. Soil Profile – 23CE261

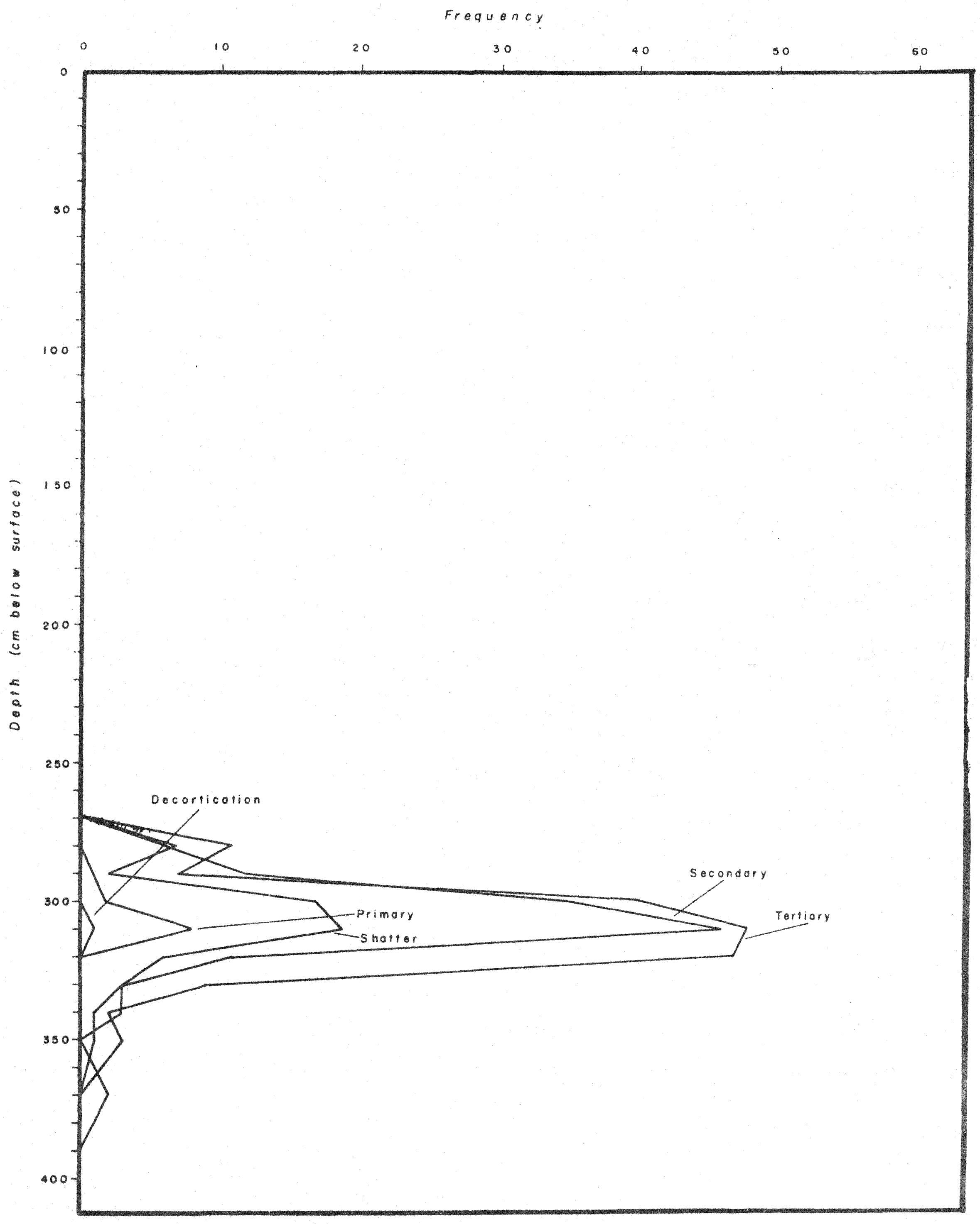

Figure 13. Flake Distribution — 23CE261

Table 14

Distribution of debitage, by level, 23CE261

Depth	A	B	C	D	E	Total
280-290	0	0	6	11	7	24
290-300	0	1	12	7	2	22
300-310	0	2	35	40	17	94
310-320	1	8	46	48	19	122
320-330	0	0	11	47	6	64
330-340	0	0	3	9	3	15
340-350	0	0	1	2	3	6
350-370	0	0	0	1	3	4
370-390	0	0	0	0	2	2
	--	--	--	--	--	---
Total	1	11	114	165	62	353

Key:

A - Cortex
D - Tertiary
B - Primary
E - Shatter
C - Secondary

however, precludes determining the horizontal extent of the material or the nature of the site in functional terms.

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Part II

THE ARCHITECTURAL SURVEY

by

Nanette M. Linderer

There are no farmsteads on properties to be purchased by the U.S. Army Corps of Engineers in the Stockton Arm of the Sac River. This is due to the geography of the river basin. In this section, the river borders on low, flat bottomland surrounded by abruptly rising bluffs. No farmsteads were constructed on these bottomlands, since the earliest settlers realized the danger of building in the floodplain. However, the river and its tributaries did provide power for several grist and saw mills. The most notable of these were Cedar, Caplinger's, and Owen's mills (Abbott 1967: 18-26, 169-184).

CEDAR MILL, first mill constructed on the Stockton Arm of the Sac River, two and one-half miles below the convergence of Cedar and Horse Creeks:

1837 John G. Williams begins construction of Cedar Mill.

1839 Cedar Mill completed and begins operation.

1840 Cedar Mill destroyed by flood. Williams decides that water flow on the creek is inadequate for a mill and abandons the

Cedar Creek site leaving only the mill dam, the foundations of the old mill and a large unused stone.

CAPLINGERS MILL on the Sac River, three miles east of Cedar Mill site:

1840 John G. Williams begins construction of the mill.

1842 Shortly before completion of the new mill, Williams sells it to the three Caplinger brothers from Tennessee. They completed and enlarged the mill.

1843 Caplinger brothers begin operations in October.

1863 Shelby's Raiders burn the mill (Abbott and Hoff 1971: 39). The Caplinger brothers rebuild after the Civil War is over.

1893 Caplinger's Mill is purchased by the Whinrey brothers and modernized.

1925 L. K. Green and Son construct a power plant opposite the mill, using the existing mill dam.

1947 Mill burns March 17 (Abbott 1967: 188).

1948 Mill resumes operation in a new galvanized metal structure, producing only corn meal and livestock feed, April 15 (Abbott 1967: 189).

1953 Mill burns and is not rebuilt.

1956 Electric plant shuts down.

OWEN'S MILL, three and one-half miles northeast of Stockton on Bear Creek:

1841 Oliver Hubbard and Richard Tatum purchase property on Bear Creek for a saw mill and begin construction.

1842 Prior to the mill's completion, Hubbard and Tatum sell it to Philip Crow.

1863 Shelby's Raiders burn the mill.

1868 Present owners, Hubbard, Owen and Jackson, rebuild the mill and add a steam engine.

1869 J. R. Owen acquires controlling interest in the mill and installs a corn mill.

1892 Owen's grandsons modernize the mill, replacing the wooden mill dam with one of stone and adding flour rollers. The date that Owen's Mill ceased operation is not known at this time. It was probably destroyed by fire. Only the mill dam and foundations of the mill remain.

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Part III

HISTORICAL AND PALEONTOLOGICAL RESOURCES

by

W. Raymond Wood

This study contains no statement on the history or historical resources of the area surveyed.

A thorough study of the historical resources of the Harry S. Truman Reservoir has just been completed (Synhorst 1977a, 1977b), a study which includes data not only on the reservoir area itself, but on its immediate environs- including the area under study in this report. Since the area with which we are concerned is so small, it is not feasible to offer a meaningful synopsis of its history without reference to the regional history- a task which has already been done in Synhorst's two studies, to which the reader is directed.

The survey teams which conducted the archeological survey noted no evidence for vertebrate paleontological remains in the area of concern. Since, however, the presence of such remains cannot be predicted from surface features, it is recommended that if and when construction is undertaken, that special pains be taken to look for fossil vertebrate remains.

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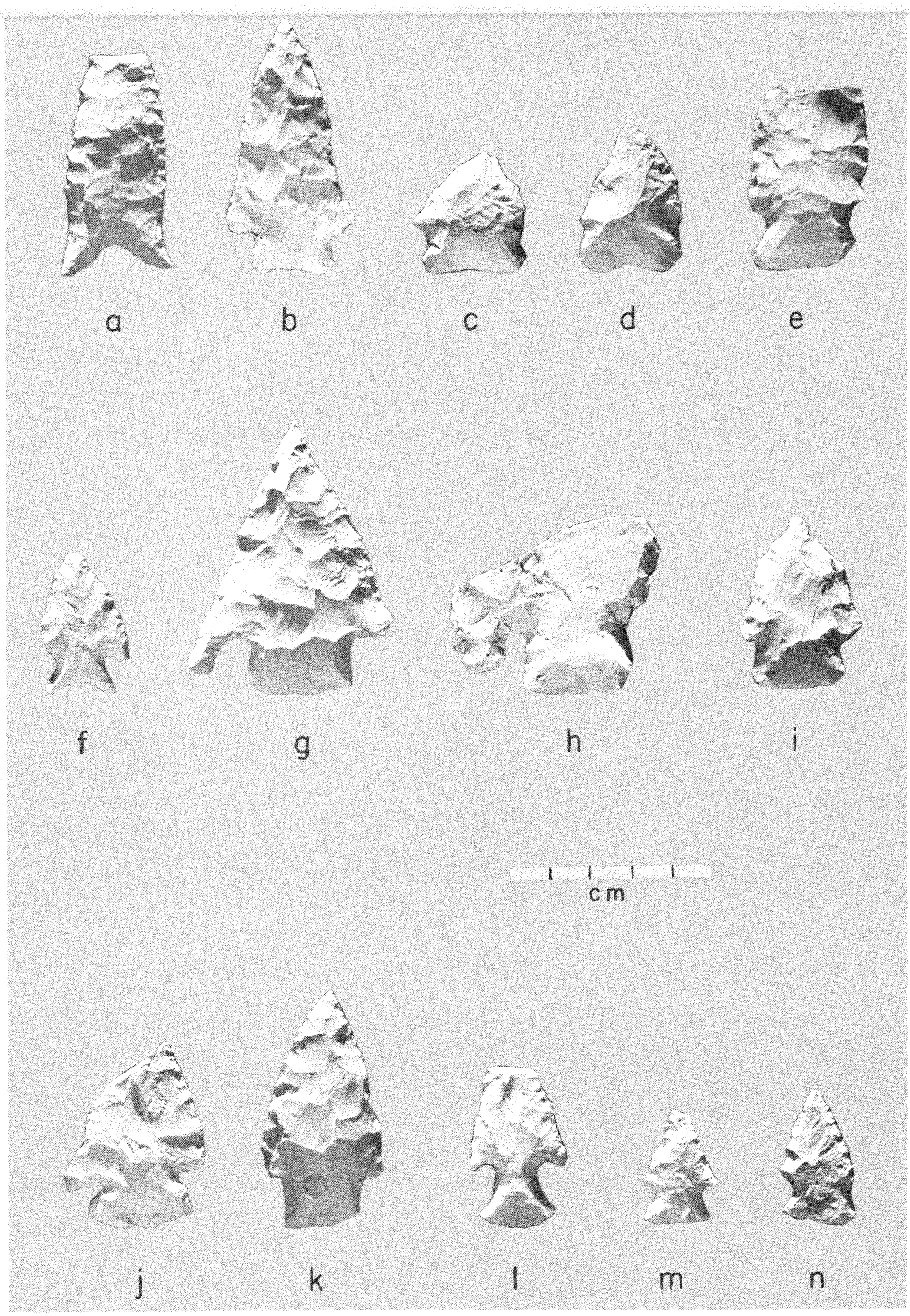

Plate 1. Points: *a*, Dalton; *b*, Rice Lobed; *c-d*, other lobed; *e*, Big Sandy Notched; *f*, Jakie Stemmed (?), *g-h*, Smith Basal-Notched; *i-j*, Afton; *l*, Cupp; *m-n*, small dart (all artifacts were coated with ammonium chloride prior to photography).

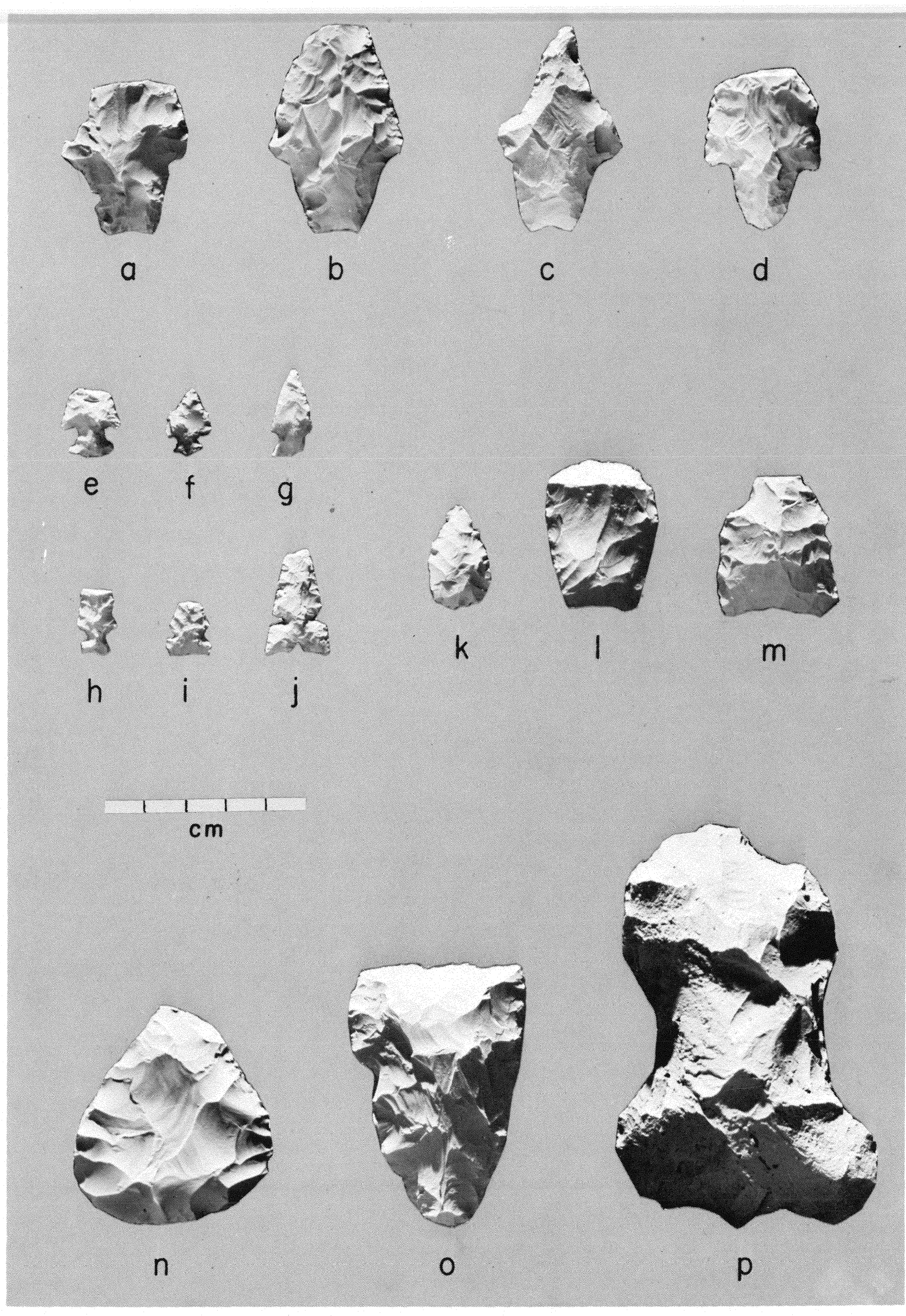

Plate 2. Points, scrapers, and bifaces: Points a-c, Langtry; d, Gary; e-k, Late Woodland. l, Hafted scraper. Point m, Rice Side-Notched. Bifaces n, Class 3; o-p, Class 4.

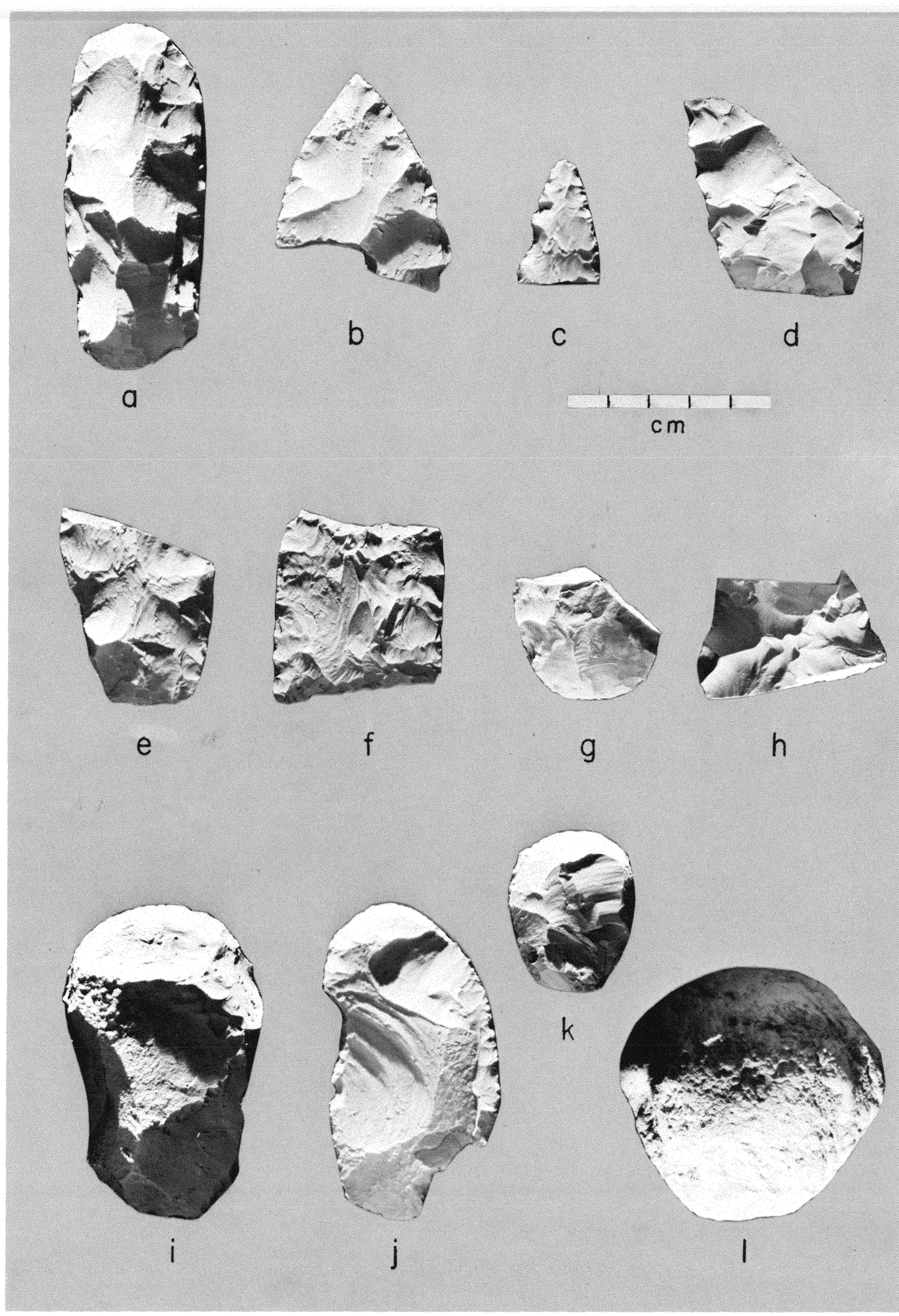

Plate 3. Bifaces, scrapers, and hammerstone: Biface a, Class 5, b-c, Class 6; d-f, Class 7; g, Class 8, h, Class 11. Scrapers i-k, Class 14. Hammerstone l, Class 17.