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To the Graduate Council:

I am submitting herewith a dissertation written by Arthur E. Bogan entitled "A Comparison of Late Prehistoric Dallas and Overhill Cherokee Subsistence Strategies in the Little Tennessee River Valley." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Anthropology.

Paul W. Parmalee, Major Professor

We have read this dissertation and recommend its acceptance:

John Guilday, Gerald Schroedl, Walter E. Klippel, David A. Etnier

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Accepted for the Council:

L. Evans Roth

Vice Chancellor
Graduate Studies and Research

A COMPARISON OF LATE PREHISTORIC DALLAS AND OVERHILL CHEROKEE SUBSISTENCE STRATEGIES IN THE LITTLE TENNESSEE RIVER VALLEY

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Arthur E. Bogan

December 1980

3046911

DEDICATION

I would like to dedicate this work to the memories of Henry T. Irwin and Roald Fryxell. These two men had a great influence on the development of my perception of the archaeological record.

ACKNOWLEDGEMENTS

The final preparation of a dissertation is the culmination of the thoughts, suggestions and assistance of many individuals over a number of years. I am deeply indebted to all of these people.

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I would like to thank Paul W. Parmalee, Gerald Schroedl, Walter E. Klippel, David Etnier and John Guilday for serving on my doctoral committee. Drs. Paul W. Parmalee and Jefferson Chapman graciously made the Toqua faunal materials available for study. The Tennessee Valley Authority and the National Park Service provided funding for excavation of the material as well as the faunal analysis. Richard Polhemus patiently answered endless questions about the location of materials at Toqua, while Ms. Nancy Bell smoothed out numerous minor problems with field notes and the location of missing materials.

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I would like to express my gratitude to Dr. Paul W. Parmalee for his support over the past several years and his constructive comments on my various attempts at writing. His patience is greatly appreciated.

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ABSTRACT

This study examines the late Mississippian Dallas Focus and historic Overhill Cherokee occupations at the archaeological site of Toqua (40MR6), Monroe County, Tennessee. The faunal remains from the Dallas occupation were subdivided according to two mounds and four village areas to test propositions relevant to the patterning of faunal remains from a chiefdom level society. These propositions were generated from the archaeological correlates of chiefdoms proposed by Peebles and Kuss. The distribution of faunal remains were examined from the floors of two domestic and one special function structures, and it was possible to establish regular patterns of refuse accumulation. The distribution of deer and bear elements revealed a selection of the front leg and to a lesser extent the hind leg by the high status occupants. The bird, turtle and fish remains, especially those from structure floor fill, point toward a restricted access to certain species and high status food preferences.

The historic Overhill Cherokee faunal sample is composed of a midden accumulation from the north side of Mound A (Zone B) and features in the East Village Area. This well preserved sample compares favorably with faunal samples of a similar time period reported from Chota (40MR2) and Citico (40MR7). The butchering pattern for the three Cherokee samples are comparable and the Overhill Cherokee pattern for partitioning animals corresponded to the Dallas pattern. The Cherokee and Dallas faunal utilization patterns correspond very closely in species utilized for food and those animals used in ceremonial or medicinal contexts. The use of freshwater mollusks continued into the historic period.

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INTRODUCTION

> The habit of creating concentrated patches of food refuse and abandoned artefacts is amongst the basic features of behavior that distinguish the human animal from other primates. The habit has created a trail of litter that leads back through the Pleistocene and can provide an extremely important source of evidence regarding the evolution of human behavior. Systematic archaeological study of the long-term features of this garbage record is still in its infancy and yet it is already apparent that it is far from being a trivial pursuit (Isaac 1971:278).

In recent years archaeology has directed its focus away from trait-lists and an obsession with pottery and projectile point typologies to the analysis of culture process and the abstraction of behavior from patterning observed in the archaeological record. One method of documentation of cultural change and process used by the cultural anthropologist is the pretest-post test observation. The case considered in this study is the faunal materials from the Toqua site (40MR6), representing both a late prehistoric occupation (Dallas focus) and a historic occupation (Overhill Cherokee). The two components of the Toqua site and the faunal data from the historic Overhill Cherokee villages of Chota and Citico are compared to establish a precontact Dallas and a post-contact Cherokee subsistence strategy.

Analysis of faunal remains from archaeological sites have served differing roles in the past 50 years, ranging from the "laundry" or "grocery" list to the reconstruction of resource exploitation patterns. Generally, animal remains have been identified in order to provide evidence for the variety of animals eaten by the site's occupants, or to study the cuts and butchering marks left on the bones for the purpose of reconstructing the processing pattern. The mollusks, especially the unionids or freshwater mussels, have been studied as a supplemental food resource and as evidence of former riverine conditions.

The faunal sample recovered from Toqua represented an opportunity to determine which animals were used for food and which were ceremonially important. This material provided an excellent opportunity to examine the effects of social ranking on the distribution of food remains in different archaeological contexts. Finally, once the Dallas animal exploitation pattern was established and the effects of a complex society on bone refuse disposal examined, it was possible to compare the Dallas patterns with the historic Cherokee subsistence pattern as evidenced from the faunal samples from Chota, Toqua and Citico. This comparison served to illustrate the marked change in animal resource utilization before and after Euro-American contact.

Objectives

This study presents a detailed analysis of the faunal remains recovered from the archaeological excavations conducted at Toqua (40MR6) and is intended to examine the following aspects of Dallas and Cherokee faunal resource utilization:

1. Document the dietary role of animals within Dallas society. The importance of individual species in the diet will be reflected in the relative frequency of the animal's remains in the Dallas faunal sample.

2. Establish the butchering pattern for major food species (e.g. deer, bear, turkey). The butchering pattern will be constructed from

data obtained on the location and frequency of cut marks on the bones of an animal. The butchering patterns for major food species should remain constant between prehistoric and historic times because the most expedient manner of processing an animal would have continued to be used regardless of whether stone or metal tools were employed. Several domestic animals were introduced during the historic period and it is suggested that the established butchering patterns should be transferred to the newly introduced species (e.g. Bogan 1976; Guilday et al. 1962; Parmalee 1965; Schroedl 1973). The transfer of butchering patterns to new animals would expedite processing (e.g. Schroedl 1973). The continuity of the butchering pattern between the Dallas and Cherokee should be evidenced by the occurrence of cut marks in the same anatomical locations in both faunal samples.

3. Identify animals which the Dallas considered status items or were associated with status roles and appear as status burial associations. The high status role of an animal or its remains should be reflected by its restricted occurrence, usually in mound burials, on a structure floor or in association with other high status items (exotic and labor intensive items).

4. Test the proposition that high status individuals in the Dallas society had differential access to food items, especially animal protein. This should be evidenced by patterning of the faunal remains, including restricted distribution of the remains of some food species and/or the differential distribution of some anatomical portions of a food species.

5. Document the Dallas and Cherokee use of aquatic mollusks and reconstruct the local riverine habitats from which the animals were probably taken.

6. Define the role domestic animals played in Cherokee subsistence at Toqua as evidenced in the Cherokee faunal sample from Toqua. The role of domestic stock in the diet at Toqua will be compared to the suggested roles of domesticates at Chota and Citico.

7. Compare Dallas faunal remains with the Overhill Cherokee faunal remains from Toqua, Chota and Citico. Comparison of the Dallas and Cherokee subsistence patterns from Toqua, Chota and Citico should reflect the shift in animal utilization from the prehistoric ranked to historic egalitarian society, and clarify the effects of Euro-American trade and the introduction of domestic stock in Cherokee subsistence.

Methodology

The faunal samples used here were recovered by several archaeologists using a variety of recovery techniques. The historic Cherokee faunal sample excavated at Citico in 1978 was recovered from feature fill which was waterscreened through ½, ¼ and 1/16-inch mesh screens (Chapman and Newman 1979:8). The Citico Cherokee faunal data has been tabulated by historic period (Bogan 1980). The large vertebrate faunal sample from Chota reported by Bogan (1976) represents the animal remains recovered during excavation from 1969-1973. Recovery techniques employed varied with the excavation. Gleeson (1970:50) notes that during the 1969 excavations:

> Material from Chota was excavated in ten foot squares by skim shoveling. All features and post molds were trowled out. Samples from many features were water-screened. In those feature samples that yielded beads an attempt was made to water screen all of the material from that feature.

He further comments that during the 1970 excavations, all feature fill was water screened through 1/16-inch mesh screen and the fine screened materials but back with the rest of the material recovered from the feature (Gleeson 1971:17). In the excavations of 1971-1973, some features were water screened but apparently the majority of faunal remains were recovered during skim shoveling and troweling.

The recovery techniques employed at Toqua were for the most part internally consistent. During the 1975 and 1976 summer field seasons feature and structure floor fill, post mold and burial fill were water screened. The fall 1976 field season continued with ". . . only sediments from discrete well controlled contexts" being water screened (Schroedl and Polhemus 1977:12). This included burials, feature and structure fill and some Cherokee features (Schroedl and Polhemus 1977:35). Some of the 1976-1977 excavations conducted by Polhemus were only trowel and shovel sorted but not water screened (Polhemus 1979, Pers. Comm.).

Differences in recovery techniques bias the interpretation and comparison of the various faunal samples. This bias also includes the uncontrolled factor of preservation in different areas of the sites and other attritional processes. The recovery techniques employed at Chota are different than those used at Citico and Toqua, while the faunal sample from Citico is comparable in recovery technique to the majority of the Cherokee fauna recovered from Toqua. Although these bias are recognized the samples from Chota, Citico and Toqua are treated as comparable.

The analysis of a faunal assemblage may be divided into three basic components: identification, quantification and interpretation. Identification forms the basis for the rest of the analysis of the assemblage. Any comments about or abstractions from the data can only be as reliable as the basic faunal identifications. The identification of the Toqua faunal sample was done using the comparative vertebrate skeleton and freshwater mollusk collections in the zooarchaeology section, Department of Anthropology, University of Tennessee, Knoxville. The identifications of bone and shell were verifed by comparison with the corresponding comparative specimens.

Quantification of faunal remains has been a point of much discussion among zooarchaeologist. Chaplin (1971:64-69) discusses some early methods used to quantify faunal remains, including bone weight and fragment counts. A variation of the bone weight method incolves the estimation of body weight by a correlation of skeletal weight to body weight (Prange et al. 1979; Wing and Brown 1979:127-135). The concept of minimum number of individuals (MNI) was introduced in North America by White (1953) and has since been the most widely used method for quantification of faunal data. However, the application of MNI has varied with individual worker (Casteel and Grayson 1977) and the varied presentations of data finally prompted Clason (1972) to outline some rules for presenting faunal data. The methods for determination of MNI have been clearly stated by Chaplin (1971) and variously modified by Bokonyi (1970), Krantz (1968) and Perkins (1973).

Zooarchaeologists have become aware of the problems associated with MNI based on small samples and how the faunal assemblage was partitioned. Munson (1974) proposed a correction factor to make faunal samples comparable. Grayson (1973) discussed the differences in the maximum and minimum distinction method for the determination of MNI for a faunal sample.

The pitfalls in the use of MNI, the problems associated with paired elements, and the relation of MNI to the faunal sample size are becoming clearly evident (Casteel 1976-1977; 1977; 1978; Grayson 1978; Wing and Brown 1979:108-135). Grayson (1979:435-436) observed that:

> The values provided by the unit favored by the archaeologist-the minimum number of individuals-vary with the way in which the faunal material is divided into the smaller aggregates that in turn form the basis of minimum number definition, and are, in addition, a function of the number of identified elements per taxon. . . . It would seem that minimum numbers cannot tell us very much about taxonomic abundances, but what they can tell us is in general also supplied by simple elements counts. The argument that more can be done with minimum numbers than with other abundance measures (Chaplin 1971), since they are felt to indicate relative abundances of actual numbers of individual animals per taxon, cannot stand in the face of the facts that the relationship between minimum and actual numbers of animals per taxon is never known, and that the relationship between these two figures must vary among taxa. Element counts, however, possess the unfortunate attribute of interdependence. . . . Even given that minimum number values are a function of numbers of identified elements per taxon, the increase in sample size that occurs as the bones of a single animal deposited in an archaeological site are increasingly fragmented will cause interpretive difficulties even if fragmentation is equally distributed across all taxa: Differences in taxonomic abundance that are statistically insignificant when examined using the relatively small numbers provided by minimum numbers of individuals may well be statistically significant when examined using the larger numbers provided by element counts.

This quote points out problems with both the use of MNI and raw element counts. The exercise of calculation of contributed meat weights will not be considered in detail in this analysis. The analysis of the Toqua faunal samples is oriented toward the identification of the species used and recognition of patterns in the distribution of those remains. The raw element counts and MNI are both used in establishing the patterns of species distribution.

The MNI for the Toqua Cherokee sample were calculated separately for the Cherokee features and Zone B (Cherokee midden on the north slope of Mound A). They were obtained from individual village areas for the

Dallas faunal sample. The method used to determine minimum number of individuals partially follows Chaplin (1971:69-75). MNI were calculated by comparing all fragments of a given element and by considering side, size and degree of ossification of each piece.

Site Location and Ecological Setting

The Toqua site is a multi-component village and mound complex located on the first terrace of the Little Tennessee River, Monroe County, Tennessee (Figure 1). This site is situated on the eastern edge of the Ridge and Valley Province (Fenneman 1938:195-197), or in what is known as the folded and thrust-faulted Appalachian Mountain Province (Eardley 1962:93-95). This location near the major ecotone between the Ridge and Valley and the Blue Ridge provinces provided the inhabitants of the site with an optimal opportunity for exploitation of food resources associated with both provinces and the adjacent Cumberland Plateau.

The site is located in the Ridge and Valley Province which, aboriginally, would have supported an oak-chestnut forest (Braun 1950: 35-36), or the oak-deer-chestnut fasciation of Shelford (1963:18-19). The variation in physiography between the Ridge and Valley and the Blue Ridge provinces provided the local inhabitants with a varied ecological setting. Bogan (1976:12-16) summarized the characteristic local vertebrate species. The vertebrate fauna is comprised of about 480 species, including 18 introduced, 7 extirpated and 2 extinct species (Bogan 1976:14). The wide animal and plant diversity, all in close proximity to the site, assured the occupants of the Little Tennessee River Valley a high degree of local subsistence autonomy (see Peebles and Kus 1977:432).

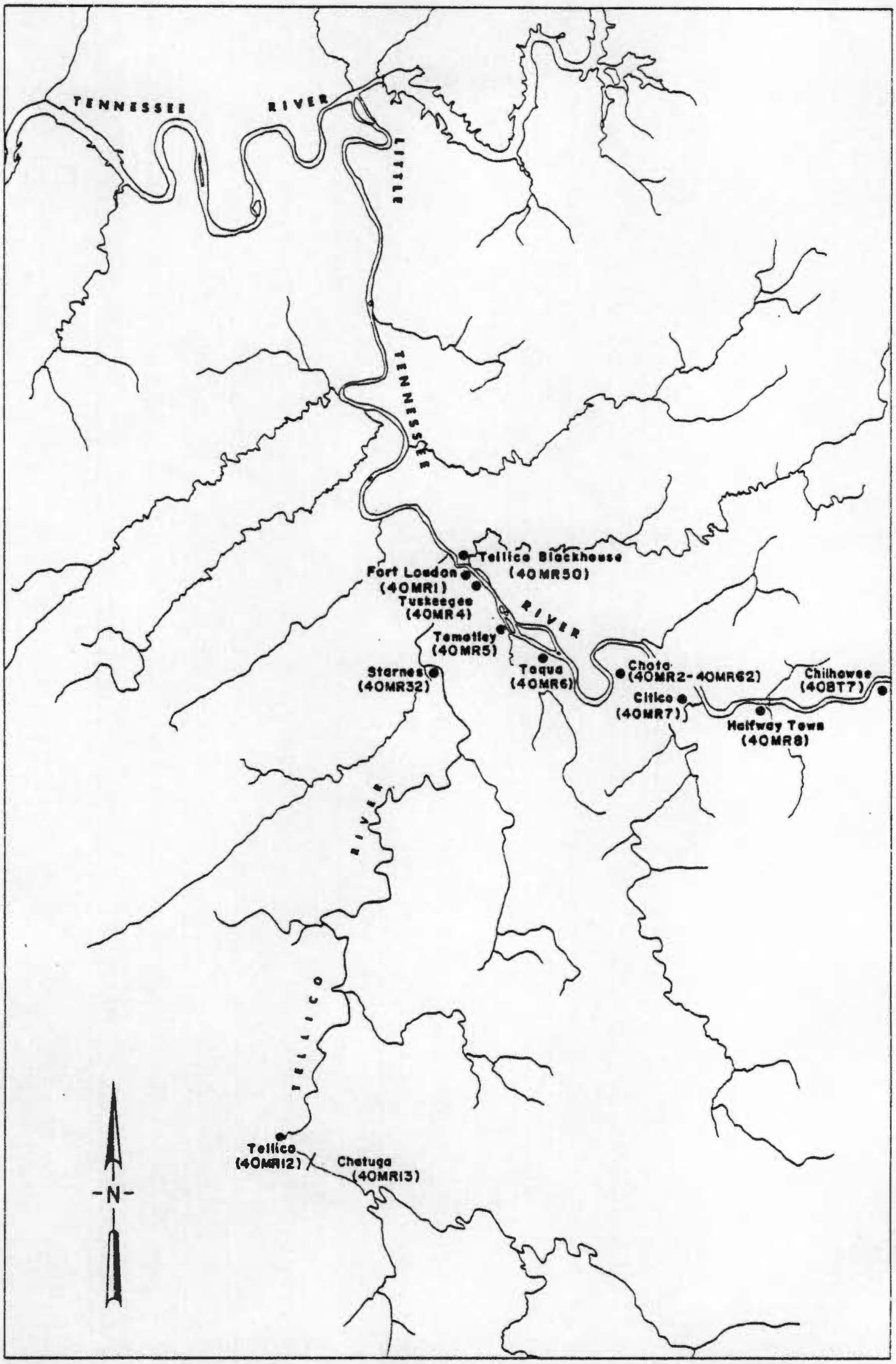

Figure 1: Location of Historic Cherokee Towns and Euro-American Military Posts, Little Tennessee River Valley (Bogan 1976:3, fig. 2).

Previous Archaeological Investigations

John Emmert, working under the direction of Cyrus Thomas for the Smithsonian Institution, Washington, D.C., conducted the first documented archaeological examination of the Toqua site. Emmert examined the upper six feet of the larger "Big Toco Mound," Mound B (Thomas 1894:383-384), and some of East Village Area.

George Barnes, a professional relic collector, initiated the first large scale excavations in the village area in the 1930s (Barnes n.d.). He excavated a trench approximately five feet deep, eight feet wide and 500 feet long, from the northwest corner of the mound along the terrace edge. The materials Barnes recovered from his excavations at Toqua were eventually acquired by the University of Tennessee, Knoxville and are housed in the Frank H. McClung Museum.

The University of Tennessee planned to excavate the Toqua site in the late 1930s in conjunction with the Works Progress Administration, but work was never started at this time and the site remained virtually undisturbed until acquired by T.V.A. in the spring of 1975 (Schroedl and Polhemus 1977:5). At that time the site area was mapped at one-foot contour intervals and plowed and gridded off in 100 foot squares which were intensibely surface collected by 10 foot squares. Information on the probable location of the palisade lines, approximate structure locations, the location and outline of the plaza area on the east side of Mound A and the location of the Barnes trench was obtained (Figure 2). The University of Tennessee Tellico Archaeological Project conducted 16 months of intensive excavations at the site between the spring of 1975 and the spring of 1977. During this time both mounds and approximately

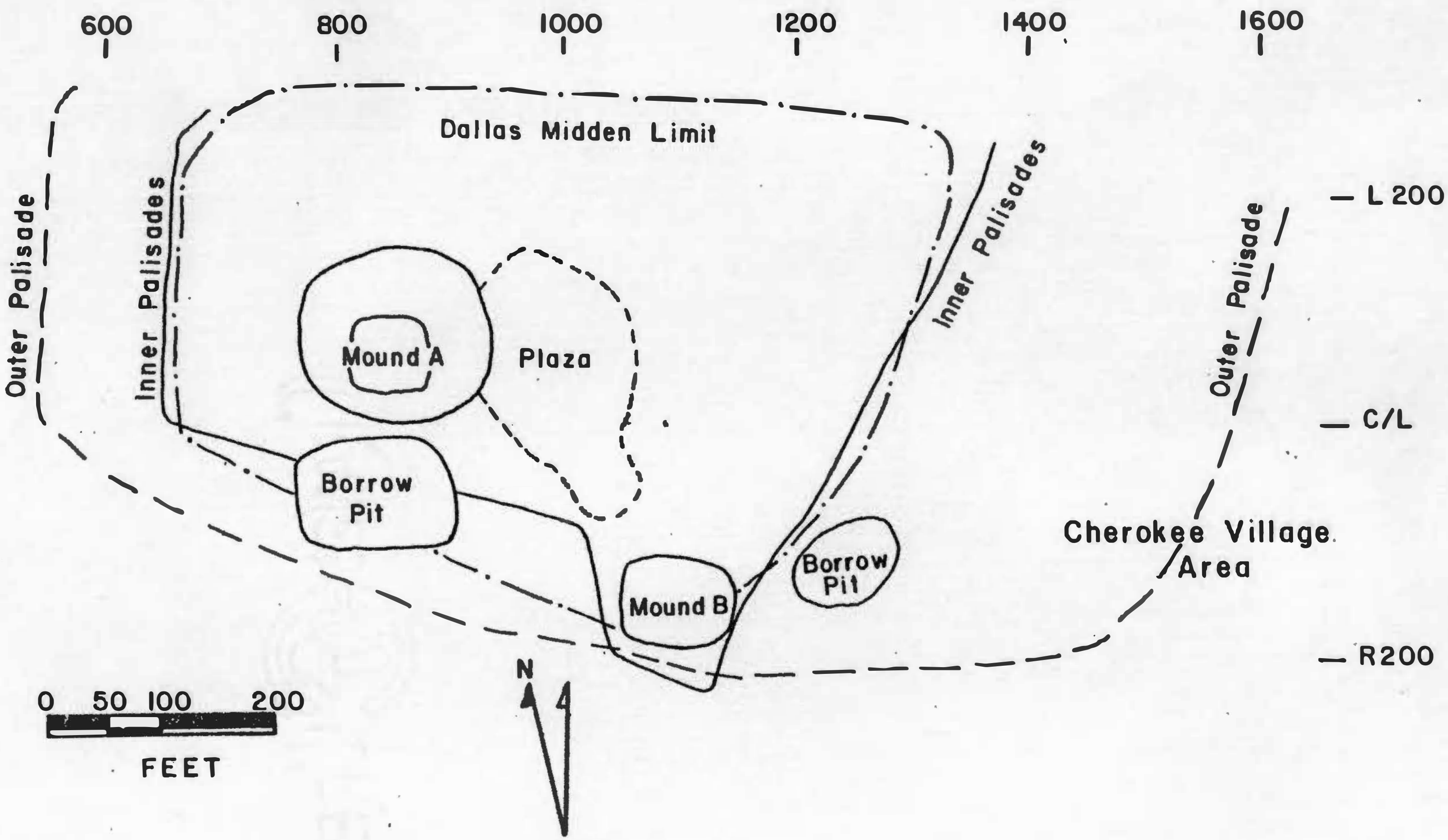

Figure 2. General Site Map for Toqua (40MR6) with the Dallas and Cherokee Areas Noted (after Schroedl and Polhemus 1977:20, fig. 8).

four acres of the village area were completely excavated (Polhemus 1979, Pers. Comm.).

These investigations revealed that the Dallas village covered approximately 500,000 square feet and had been enclosed on three sides by a trench-type palisade (Figure 2). Two palisade lines were evident; these enclosed single-post rectangular structures (Schroedl and Polhemus 1977:21). Mound A exhibited nine construction phases, each with its own associated burials, structures and ramp. Mound B had two construction phases that included two structures and associated burials. The premound surface below Mound B had also been utilized (Schroedl and Polhemus 1977:24-31). During the excavations more than 110 structures and 1502 occupational features were assigned numbers, but all were not excavated; 68 features were Cherokee (Polhemus 1980, Pers. Comm.). Intensive controlled surface collecting and subsequent test trenches indicated a Cherokee occupation area almost completely separate from the Mississippian occupation (Figure 2). Three areas east of the main Mississippian occupation, totalling 0.6 acres were stripped to obtain structural data comparable to that from Chota, Tomotley, and Tanasee. Some of the Cherokee features were excavated in order to provide a sample of the cultural material from this area (Schroedl and Polhemus 1977:11).

The faunal sample and burial associations recovered from the historic Overhill Cherokee and Dallas excavations are summarized in Table 1. The two major components will be further subdivided and discussed.

Definition of Dallas and Mississippian Culture

Various definitions of the Mississippian culture or period have been presented. Griffin (1967:189) offered the following definition of

TABLE 1. Summary of Toqua Faunal Remains.

Class	Cherokee Bones	Cherokee MNI	Dallas Bones	Dallas MNI	Disturbed Context	Total
Mammals	35,093	129	49,883	311	4,438	89,414
Birds	2,222	46	4,965	97	334	7,521
Reptiles	4,582	64	11,118	289	469	16,169
Amphibians	108	26	471	53	13	592
Fish	4,012	61	9,450	109	144	13,606
Total	46,017	326	75,887	859	5,398	127,302
Shell	3,153		11,067		2,052	16,272
Burial Associations	27		14,162			14,189
Grand Total	49,197		101,116		7,450	157,763

Mississippian:

> The term "Mississippian" is used here to refer to the wide variety of adaptations made by societies which developed a dependence upon agriculture for their basic, storable food supply.

More recently Smith (1978:486) has proposed an alternative definition for "Mississippian":

> those prehistoric human populations existing in the eastern deciduous woodlands during the time period A.D. 800-1500 that had a ranked form of social organization, and had developed a specific complex adaptation to linear, environmentally circumscribed floodplain habitat zones. This adaptation involved maize horticulture and selective utilization of a limited number of species groups of wild plants and animals that represented dependable, seasonally abundant energy sources that could be exploited at a relatively low level of energy expenditure. In addition, these populations depended significantly upon an even more limited number of externally powered energy sources.

The particular level of sociocultural integration usually associated with Mississippian period cultures in the Southeast is the chiefdom (e.g. Hudson 1976:95; Jones 1978), in contrast, the historic Cherokee represent an egalitarian level of social organization. Goldstein (1976), Hatch (1974; 1976), Peebles (1978) and Stephonitus (1978) have examined various aspects of the archaeological manifestations of chiefdoms. Smith's (1978:486) definition of Mississippian provides a degree of latitude within the level of social complexity absent in earlier definitions. Along this line Hudson (1976:203) stressed that:

> it should be understood that not all chiefdoms comprised comparable numbers of people, nor were they equally centralized. Chiefdoms may have small populations or large, and their chiefs may be relatively weak or strong.

This variablity in the complexity of chiefdoms should be carefully considered when attempting to apply the concept to archaeological material (e.g. Goldstein 1976).

This follows the social evolutionary model proposed by Sanders and Webster (1978) that is used here. This model assumes culture is a system. The use of the chiefdom model for the Dallas focus presupposes that certain aspects of a chiefdom level society are preserved in the archaeological record.

The terms rank, role and status are regularly encountered in literature on Mississippian archaeology, but are rarely defined or operationalized. Many variations exist in the use of these terms, but generally, they seem to be treated as synonymous. Goldstein (1976:10-13) carefully explores these terms, relying on the classical discussion of status and role by Goodenough (1965). Goodenough (1965:2) defines the formal properties of status as:

> (1) what legal theorists call rights, duties, privilages, powers, liabilities and immunities. . . . and (2) the ordered ways in which these are distributed in what I call identity relationships.

Goodenough (1965:2) points out that Linton defined status as a collection of rights and duties, but used the term for categories or kinds of persons while role is the "dynamic aspect of status, the putting into effect of its rights and duties " (Goodenough 1965:2). Goodenough (1965:2) further comments that "all writers who do not treat status as synonymous with social rank do much the same thing" as linton in their use of the concept of status. The term, status, will be used here to indicate the social rank of individuals.

The Late Mississippian manifestation in East Tennessee is represented by the Dallas focus. The Dallas focus was defined by Lewis and Kneberg (1946:10) as a Middle Mississippian culture restricted to East Tennessee along the Tennessee River and some of its major tributaries above

Chattanooga and although they called it Middle Mississippian most subsequent authors have used Late Mississippian. The definition of the Dallas focus was based on a list of traits covering various aspects of subsistence, settlement, architecture, pottery and work in bone, shell, stone and copper (Lewis and Kneberg 1946:175-179). Lewis and Kneberg (1946:10) identified the Dallas focus as the prehistoric counterpart of the historic Creek Indians. More recently Keel (1976:216) and Dickens (1976:212-214; 1979:12) have suggested that Dallas was the prehistoric counterpart of historic Overhill Cherokee. The possible historic affiliations of Dallas will not be considered here since the comparison of subsistence will be made between a prehistoric ranked society and a historic tribe exploiting the same geographic area.

Social Typologies

Archaeologists seeking to place aboriginal societies on a comparative scale have turned to studies of ethnography for typologies of societies. Various schemes have arisen but the work of Sahlins (1958), Service (1962; 1971; 1975) and Fried (1960; 1967) have been widely used by archaeologists. Sahlins (1958) worked with Polynesian groups and tried to show that diversity, clustering and scarcity of resources induced different degrees of stratification and that with an increase in the diversity and dispersion of resources, stratification should increase. The redistribution process (distribution of goods and services) was though to be a critical factor in the emergence of stratification (Fried 1960:719; Sahlins 1958:20). The distinction between the producer and the distributors corresponds to that between non-chiefs and chiefs; the chiefs were the focal point for collection and redistribution. The degree of stratification and hence the prestige as well as political and ceremonial influence accorded to a chief varied directly with local productivity (Sahlins 1958:5).

Service (1971) has expanded the concepts discussed by Sahlins into a social typology. He provides a discussion of the social organization of chiefdoms, pointing out the important rule of redistribution, increased complexity of organization, productivity, population density and their regular occurrence in areas of ecological diversity (Service 1971:135). Service (1962:139, 145) points out one of the distinctive characters of the chiefdom:

> pervasive inequality of persons and groups in the society . . . . Distinctiveness in dress and ornamentation seem to be the most visible of these and probably the simplest, and perhaps the first, that were instituted. Others may involve food, diversions, ritual positions . . . . (Service 1971:139, 147).

Chiefdoms tend to expand and with increased distance from the center of the chiefdom, the rank differences of the groups approaches the cone shape of the conical clans of Kirchhoff (1959). Kirchhoff (1959:268) pointed out that all leading economic, social and religious positions are reserved for those of highest descent, i.e. those individuals closest to the ancestor of the clan and tribe: the chief and his associates.

Service (1971:157) questions the continued use of the stages of composite band, band and tribe. He also points out problems with distinguishing between chiefdoms and primitive states and suggests replacing these last two terms with the phrase hierarchical society (Service 1971:157). Service (1975:75, 79) further employed the concept of chiefdom in his discussion of the origin of the state with redistribution being an important attribute of the chiefdom.

Morton Fried (1967) has also provided an alternative to the classification scheme of Sahlins (1965), using the concepts of egalitarian, ranked and stratified societies and states. He felt that in the ranked society the major process of economic integration was redistribution, with the flow of goods into and out of a central location. This central point usually was the pinnacle of the rank hierarchy (Fried 1960:718; 1967:117). The concept of a chiefdom emerges as a ranked or hierarchical society with the chief as the seat of redistribution but lacking any formal authority.

Archaeological Applications of the Chiefdom Model

Renfrew (1973; 1974) has attempted to operationalize the chiefdom model and apply it to archaeological remains from England. He outlined 20 traits which he felt should characterize a chiefdom. Tringham (1974) has criticized Renfrew's application as being restrictive and that many of his 20 traits are difficult to operationalize. Tainter (1978) concurs with Tringham and points out the use of a restrictive typology may obscure evidence of cultural change in the archaeological record. Sanders (1974: 109-111) commented on problems of operationalizing the chiefdom model in an archaeological context and then examined the archaeological evidence for political evolution at Kaminaljuyu, Guatemala. Peebles (1974; 1978) has used the concept of the chiefdom in modeling the patterning in the mortuary remains from Moundville, Alabama. Hatch (1974; 1976) and Hatch and Willey (1974) have used the chiefdom model in examining the Dallas mortuary data from east Tennessee. Sabol (1978) has criticized Hatch's (1974) and Hatch and Willey (1974) synchronic model of Dallas mortuary patterning. He comments that their model does not consider the factor of time and "ignores the enormous structural and functional variability between and within Dallas settlements" (Sabol 1978:26). Sabol (1978) provided a model of the Dallas status and rank system based on the chiefdom model and trade. Goldstein (1976) utilized ideas about mortuary patterning (Saxe 1970; Tainter 1978) and the concept of a hierarchical society to model the Mississippian mortuary data from the lower Illinois River Valley and to test several of Saxe's (1970) hypotheses concerning mortuary patterning.

Peebles and Kus (1977) carefully examined the concept of chiefdom and concluded that redistribution, which Service (1971) and Fried (1967) used as an important characteristic of chiefdoms, should be deleted from the definition. They examined the chiefdom model and Polynesian examples of complex chiefdoms and concluded that redistribution was neither a "univariate phenomena, a causal factor, nor a constant correlate of chiefdoms". Peebles and Kus (1977:424) observed that:

> (1) Redistribution was not the dominate mode of economic exchange; (2) that those goods which were redistributed devolved only upon the "elites"; and (3) redistribution did not serve to unite independent communities in diverse biotic and physiographic zones.

Peebles and Kus (1977:444) felt that by removing redistribution as the defining and causal factor in ranked societies, archaeologists will have to more carefully examine the environmental relationships of these societies. They replaced redistribution, at least for the archaeologist, with the following concepts:

> The structure of mortuary ritual, settlement relationships, subsistence autonomy and part time craft specialization . . . as these measures are redefined, they should serve to differentiate levels of socio-political complexity within . . . chiefdoms (Peebles and Kus 1977:444).

The different levels of complexity are suggested for the patterning of mortuary data by Goldstein (1976).

More recently, Sanders and Webster (1978) have carefully explored the use of cultural evolutionary paradigms. They propose a multilineal model for cultural evolution based on the work of Service (1962), Fried (1967) and Steward (1955). This multilineal model was applied to Meso-American data providing a dynamic model for societal evolution.

The concepts of ranked society and chiefdom seem to be used in the archaeological literature as interchangable. However, in carefully considering the definition of chiefdom, the concept of a chiefdom is actually a cline from a ranked to a stratified society and various chiefdoms exhibit traits of both of Fried's societal types.

This examination of the application of the chiefdom model or ranked society concepts to archaeological data illustrates both their utility and the problems in operationalizing these concepts. The concept of a chiefdom level or ranked society in a multilineal model of socio-cultural evolution is used here. The use of this classification system is as a heuristic device.

If we accept Goldstein's description of Mississippian society;

> Mississippian is a hierarchically organized society, and this society can perhaps best be understood in terms of a hierarchy of corporate groups who control access to crucial and restricted resources. These crucial resources may be land (and perhaps other subsistence-related resources) or the lowest of the hierarchy, with each succeeding level increasing the territory, and perhaps the kinds of resources, controlled. The highest level would control not only all land ultimately, but also other resources and exchange items (Goldstein 1976:265).

it is then possible to begin to generate propositions about the archaeological visibility of a chiefdom. Peebles and Kus (1977:431-433) propose five correlates of chiefdoms which can be tested with archaeological data:

1. "There should be clear evidence of nonvolition, ascribed ranking of persons " (Peebles and Kus 1977:431). Today, the most effective way to clearly demonstrate ranking in archaeological material is through the examination of mortuary data (Binford 1971; Brown 1971; Hatch 1974; 1976; Peebles 1974; Saxe 1970; Tainter 1978).

2. "There should be a hierarchy of settlement types and sizes, and the position of settlements in the hierarchy should reflect their position in the regulatory and ritual network " (Peebles and Kus 1977:431-432).

3. "All other things being equal settlements hould be located in areas which assure a high degree of local subsistence sufficiency " (Peebles and Kus 1977:432).

> The choice of such locations (a) maximized the availability of both wild and domesticated foodstuffs; (b) yielded the synergistic benfit of two interlocking procurement systems; (c) tended to damp out environmental fluctuations (Peebles and Kus 1977:441).

The location of settlements were on the best and most easily worked agricultural soils and in areas of high physiographic and ecological complexity.

4. "There should be evidence of organized productive activities which transcend the basic household group" (Peebles and Kus 1977:432). This is evidenced by mound construction and by part-time craft specialization usually with intersocietal trade.

5. "There should be a correlation between those elements of the cultural system's environment which are of a frequency, amplitude and duration to be dealt with, but which are least predictable and evidence

of society-wide organizational activity to buffer or otherwise deal with these perturbations " (Peebles and Kus 1977:432-433).

The ranked Mississippian societies relied on a simplified ecosystem with the plant foods being dominated by corn, beans and squash. Ford (1974:400) notes:

> The Mississippian ecosystem was a simplified food base with agriculture the dominent mode of production supplemented by continued hunting and collecting.

The simplified ecosystem required that Mississippian society established a more complex form of internal organization to buffer against possible crop failure. Mississippian societies still utilized a wide spectrum of animal resources in the diet (e.g. Guilday and Parmalee 1975; Parmalee 1975; Robison 1977).

The first of Peebles and Kus' archaeological correlates needs to be further expanded, Analysis of Mississippian mortuary data has provided evidence for ascribed ranking, thus supporting the correlate. A corollary of this correlate can be constructed using the definition of a chiefdom; that is, there is differential access to food items by high status individuals (especially animal protein). Evidence for the quality of the diet is reflected in varying degrees in the development and maturation of the human skeleton. Evidence to support the concept of a different quality diet for different statuses can be obtained from a careful examination of Mississippian human skeletal remains. The examination of human skeletal pathologies and their etiology can provide possible evidence of dietary deficiencies.

Recent work on Wilson bands (bands of disturbed enamel formation) in human teeth in Illinois has documented a significant increase in the frequency of bands from Mississippian accultured late Woodland groups to

Mississippian populations (Rose et al. 1978). Rose et al. (1978:512) developed a model suggesting the transition from Woodland to Mississippian and the accompanying increased dependence on maize horticulture that lead to an increase in stress in the diet, The frequency of porotic hyperostosis (cranial lesions of the anterior supraorbital region) follows this pattern, suggesting an increase in stress in nutrition through time. The frequency of Wilson bands shows the same increase through time (Rose et al. 1978:514-515).

The relation of porotic hyperostosis (or cribra orbitalia) has been recently related to nutritional problems, probably that of iron deficiency anemia (Hengen 1971:69; Steinbock 1976:244-248). El-Najjar, working in the American Southwest, has researched the paleoepidemiology of porotic hyperostosis and found a higher incidence of the pathology in populations with a heavy reliance on maize horticulture, as opposed to contemporaneous populations without the dependence on maize (El-Najjar et al. 1975; El-Najjar, Ryan et al. 1976; El-Najjar 1976; 1978; El-Najjar and Robertson 1976). Children show a higher incidence of porotic hyperostosis because of increased iron and protein requirements that were lacking during critical periods of growth (El-Najjar 1976:336).

Recent work on burial populations from Ohio and Illinois have documented the relationship of porotic hyperostosis and infectious disease (Lallo et al. 1977; Lallo et al. 1978). Lallo et al. (1977:479) provided evidence of dietary stress as a result of increased reliance on maize that resembled the iron deficiency anemia described by El-Najjar in the Southwest. Lallo et al. (1977:479) were able to document the increase in frequency in porotic hyperostosis through time with the highest frequency occurring in Middle Mississippian populations.

The period in a child's life when the synergistic stresses imposed by nutritional deficiency and infectious diseases are greatest is between 6 and 24 months (Mensforth et al. 1978:12). At six months of age a child's indigenous iron stores have been depleted and the child becomes dependent on an external source of iron.

> Maize and/or high phosphorous diets would not supply the necessary iron. Weaning, growth retardation and the period of rapid osseous growth all occur at a time when indigenous iron stores are low but iron requirements are high (Lallo et al. 1977:480).

The human skeletal evidence points to a high correlation of these pathologies with a diet consisting primarily of corn. All of this work points to the importance of adequate iron consumption during the child's early formative years for sustained normal growth. Iron deficiencies and poor iron absorbtion are associated with protein-poor diets (Wing and Brown 1979:88). Without adequate iron intake, the health, growth and development of the child will be retarded, arrested and/or terminated.

The Dallas mortuary data have been examined to determine if they reflect evidence of social ranking. Willey (1973) discussed skeletal attributes which could show the effects of social ranking and presented some preliminary findings on Dallas mortuary patterns. Hatch (1974) examined 1284 Dallas burials and their associated items from 19 archaeological sites. He was able to demonstrate differences in the burial associations and status of individuals from the mounds and village areas in these 19 east Tennessee archaeological sites. Hatch and Willey (1974:118) further examined the correlation of status and stature using a sample of 211 Dallas burials. They were able to show that males buried in mounds were significantly taller than those in the village, but that this trend did not hold for females. The differences in stature may be explained by a combination of factors: genetic, diet, illness or social mobility.

> Differences in diet can cause stature diversity, within an otherwise homogeneous population; long-term nutritional differences between subpopulations may be manifested as differences in average and overall health . . . . The stature gradient seen above could be explained if the redistributive economic system favored individuals of a closer genealogical relationship to the chief. . . . than those more distantly related. Subtle differences in the nutritive intake per year or favoritism in the redistribution of food surpluses during crisis periods could cumulatively influence adult stature (Hatch and Willey 1974:120, 122).

Analysis of Harris lines (lines of arrested growth) in the Hixon site mound burials (Hamilton County, Tennessee) has begun and the preliminary data suggest that social ranking becomes clearer through time and that, in the later burials, the high status individuals have fewer Harris lines than those of earlier burials (Willey 1979, Pers. Comm.).

Hatch (1976) expanded his earlier work on Dallas mortuary patterning to include the development of three mortuary models based on a series of ethnographically documented Polynesian and African chiefdoms. After developing these three models, he compared the data on Dallas mortuary patterns with the models and decided that the ethnographic model with which the Dallas data most closely matched was a chiefdom that included dietary advantages for the chiefs and the other high ranking individuals in the chiefdom. Hatch (1976:121) observed:

> dietary differences between groups could be visible archaeologically as differences in overall body development, stature, stress indicators (Harris lines and dental hypaplasia, for example), or the prevalence of nutritionally related diseases.

The existence of status and stature difference between mound burials and village burials had been demonstrated (Hatch and Willey 1974;

Hatch 1976:130-135). Preliminary analysis of the burials from the Toqua site indicate a significantly higher occurrence of cribra orbitalia among subadults buried in the village than in subadults buried in the mounds (Parham and Scott 1980).

The preceeding examination of Late Mississippian mortuary data clearly indicates a different diet between status groups. The significantly different statures and the frequencies of pathology found in mound versus village burial samples appear to be related to the amount of animal protein consumed. Returning now to the discussion of Peebles and Kus' (1977:431) archaeological correlates of chiefdoms, it is possible to expand their first correlate. Dallas mortuary data has been shown by Hatch (1974, 1976) to represent a ranked society. Considering the differences in stature, suggested differences in frequency of Harris lines, Wilson lines and the correlation of a high incidence of porotic hyperostosis with a high maize and/or phosphorus diet, some archaeological correlates about the availability of animal protein and the patterning of the faunal remains in the archaeological record may be generated.

These archaeological correlates are:

1. The status of a burial should be reflected by the animal remains associated with it. This evidence might include remains of animals whose use was restricted to high status individuals, species such as raptors, mustelids, swans and possibly cranes. The status of animal burial associations can be identified on the basis of their distribution (mound= high status; village=low status), frequency of specimens and possible association with other labor intensive burial goods.

2. The status of the individuals using a structure should be indicated by labor intensive items or animals with status roles

associated with burials in the floor or items left in the structure.

3. Low status burials should lack animal associations found with high status individuals, but may contain the body parts of common food animals representing skins, food items, tools or artifacts. Some elements may represent hunting charms or amulets.

4. Dietary differences are indicated by the physical anthropological data: i.e. a differential access to protein. This difference in access to protein was along status lines and suggests that different species (e.g. different species of turtles, ducks and fish) were consumed by high status individuals compared with those in low status groups. This food preference should be evidenced by a differential distribution of a species' remains within the site (e.g. Pohl 1976; 1978).

5. Another indication of status differences in the meat portion of the diet should be a differential distribution of cuts of meat of the major food species within the site. This would be evidenced by a higher frequency of prefered cuts of meat in the high status area than in the low status area.

The archaeological correlates about the patterning of faunal remains can be combined with the Goldstein (1976) concerning patterning in Mississipian mortuary data to generate further correlates about patterning in faunal remains from a complex society. Goldstein (1976) sees an increase in complexity of ranking as evidenced in the mortuary data along a gradient from farmstead and hamlet to secondary and major Mississippian sites. The smallest hamlets have an essentially egalitarian social organization and are at one end of the gradient. Social organization increases in complexity along the cline of site size and complexity from the simple hamlet to the most highly organized major centers. The degree of patterning in the faunal remains should follow the same trend as the mortuary data, that is, most of the labor intensive and exotic items, personal bundles and animals reserved for high status use should be absent in hamlets, increase in secondary centers, and reach the highest concentrations in the major sites. The degree of differential access to animal species for food probably would not exist or be minimal in a hamlet, but the differences in access to animal protein should increase with site size and complexity, the strongest pattern being exhibited in the major sites within the settlement pattern. The Mississippian faunal data from Toqua will provide only a small part of the information required to test this correlate.

The final acceptance or rejection or the propositions about the archaeological visibility of a chiefdom will be based on the data recovered from the Dallas and Cherokee faunal samples from Toqua. Verification of the propositions will be the observation of the expected pattern in the Dallas faunal sample. However, if a proposition is not supported by the Toqua faunal sample, it does not necessarily indicate that the proposition is false. Considering the variablity of chiefdoms, propositions valid for a complex chiefdom as Moundville would not necessarily hold for a less complex chiefdom (possibly Toqua).

CHAPTER II

DALLAS ANIMAL RESOURCE UTILIZATION

Introduction

The faunal remains recovered from the late Mississippian Dallas occupation at Toqua (40MR6) provide an opportunity to reconstruct Dallas animal resource utilization. The generally good preservation of bone and shell across the site, the large faunal sample and the diversity of archaeological contexts as to how a chiefdom would be preserved or be visible in the archaeological faunal record of Toqua.

Polhemus (1979, Pers. Comm.) divided the site into six village areas in order to facilitate the description and comparison of materials from different contexts. His divisions are used here for the comparison of the Dallas faunal remains (Figure 3). These areas include West Village, North Village, Mound A, Mound B, East Village Midden and East Village (Figure 3). The two mound areas include the mound proper. West Village includes the habitation area inside the western palisade and west of Mound A, while the North Village Area consists primarily of the large structure on the north apron of Mound A. The East Village Midden Area was the largest of the excavated areas and was also the one with deepest midden accumulation. The western edge of this area is bordered by the plaza and the eastern edge by one of the palisade lines. East Village ia any Dallas occupation materials which occur east of the East Village Midden palisade line. The faunal remains and bone artifacts from features, burial associations, midden

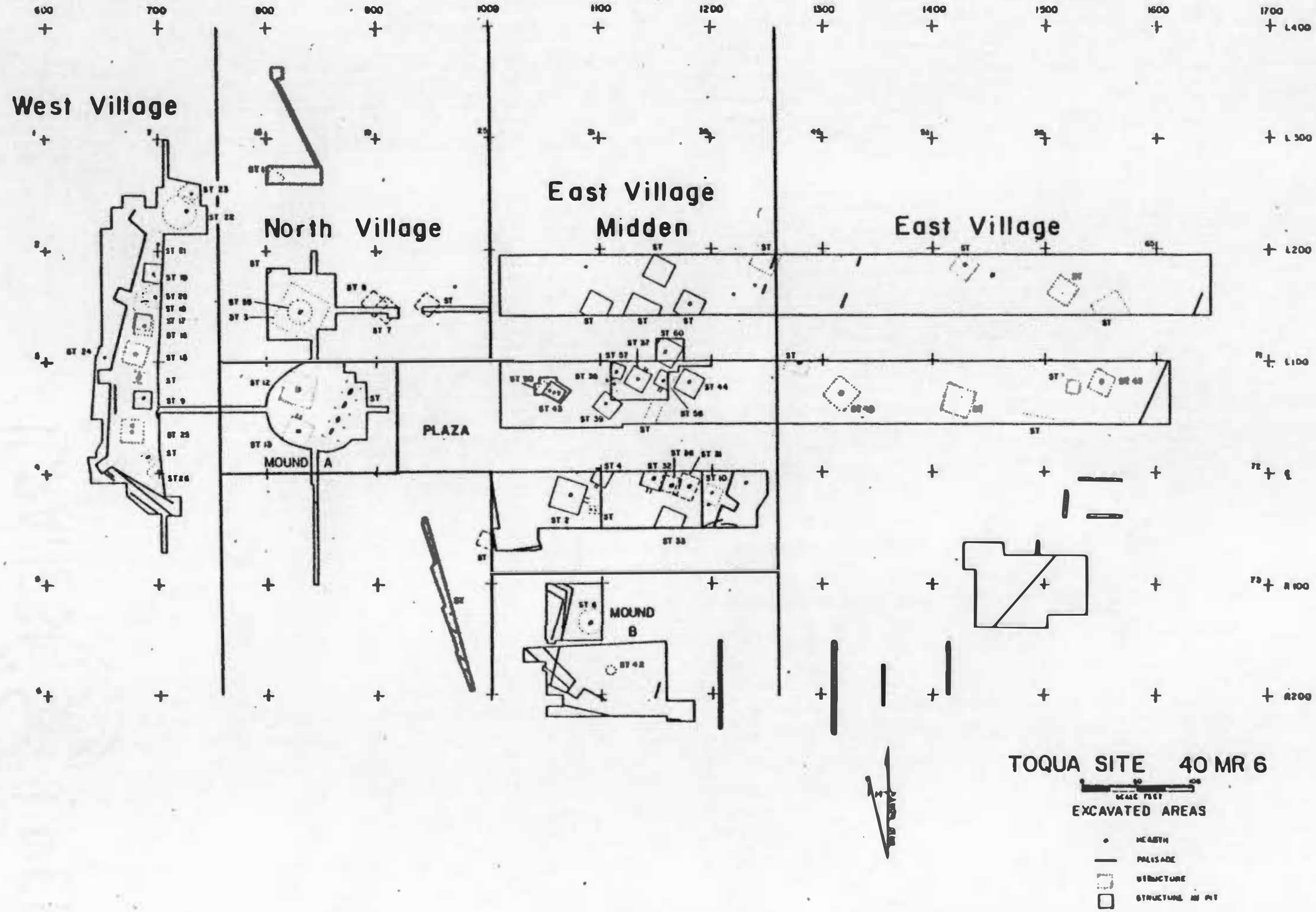

Figure 3. Dallas Occupation with the Designation of the Six Village Areas.

accumualtions and structures were examined and tabulated, using these designated village areas. These areas were the units used to compare the distribution of animal species and elements in testing for the differential access to protein resources, special treatment of animal remains and the distribution of status related species. The distribution of dog-chewed and/or digested animal bones were tabulated by village area in an effort to document one of the attritional processes affecting the Toqua vertebrate sample. Faunal remains from the floors of three structures (3, 14, 39b) were examined for evidence of patterning. The total faunal samples from seven structures (2, 3, 4, 9, 13, 14, 39b) from four village areas were compared to determine if animal utilization patterns observed in the midden and feature material could be further refined, possibly shedding light on status food preferences or as evidence of food resource redistribution.

It is assumed that individuals having immediate access to both mounds, or those living on Mound A, would have been high status. Since the plaza fronted on the ramp on Mound A and was probably the center of ceremonial as well as political activities, individuals occupying houses immediately adjacent to the plaza may have been high or mid-level status if a three or more level hierarchy is assumed (e.g. Peebles 1978). This immediately suggests the area behind (west) Mound A and the area farthest from the plaza were occupied by lower status or "common" individuals (West and East villages). The North Village Area (Structure 3), as a function of its location of the apron of Mound A, represents either a high or intermediate status location. Polhemus (1979, Pers. Comm.) suggests that Structure 3 was a men's house or a special function structure, based on its size, location and floor contents. Areas of high status occupation should include exotic marine shell artifacts, remains of the preferred cuts of meat, evidence for the use of ceremonial animals (e.g. raptors, mustelids) and possibly evidence for food species preference. On the other hand, areas of low status activity should not contain labor intensive items such as marine shell (e.g. gorgets) and ceremonial animals, but would include the bones from poorer cuts of meat and the lesser animals not reserved for high status.

Relative Use of Vertebrate Species

The vertebrate faunal sample from the Dallas occupation at Toqua totaled 75,887 pieces (Table 2). This faunal sample was recovered from 28 structures, 140 features and 275 accessioned lots of Dallas midden (Table 3). These remains are tabulated by midden, feature and structure floor fill by village area; the minimum number of individuals (MNI) are listed by village area. Vertebrate remains from midden areas constitute 25.62% of the faunal sample, from structures 48.95% and from features 25.43%. The large faunal sample from Structure 3 in North Village contributed 74% of the faunal remains from the Dallas structures. Mammal remains constituted the bulk of the sample (65.73%), followed in decreasing order by reptiles (14.65%), fish (12.45%), birds (6.54%) and amphibians (0.62%). These percentages generally reflect the importance of each of the vertebrate classes to the Dallas inhabitants of Toqua. The reptiles may be somewhat over-represented due to the fragmentary nature of the turtle remains.

Mammals

The mammal remains constitute the bulk of the vertebrate material from the Dallas occupation. These remains represent at least three

Table 2: Summary of Dallas Vertebrate Remains.

Species	West Village Midden	Structure	Feature	Total	%	MNI	%	North Village Midden	Structure #3	Feature	Total	%	MNI	%	Mound A Midden	Structure	Feature	Total	%	MNI	%	East Village Midden Midden	Structure	Feature	Total	%	MNI	%	East Village Structure	Feature	Total	%	MNI	%	Mound B Feature	Total	%	MNI	%	Total Dallas Total	%	MNI	%
Mammals																																											
Opossum, *Didelphis marsupialis*	1	1	1	3	.11	1	3.03	2	1	1	4	.01	2	2.43								9		1	10	.04	2	1.18		1	1	.08	1	12.50						18	.03	6	1.92
Eastern Mole, *Scalopus aquaticus*									2		2	T	1	1.21								2		1	3	.01	1	.59												5	.01	2	.64
Eastern Cottontail, *Sylvilagus floridanus*			1	1	.03	1	3.03	2	16		18	.07	1	1.21		1	1	2	.07	1	5.55	22	4	8	34	.16	3	1.77		3	3	.25	1	12.50						58	.11	7	2.25
Eastern Chipmunk, *Tamias striatus*									1		1	T	1	1.21																										1	T	1	.32
Woodchuck, *Marmota monax*																						4	1		5	.02	2	1.18												5	.01	2	.64
Gray Squirrel, *Sciurus carolinensis*									11		11	.04	1	1.21	2	1	1	4	.14	1	5.55	5			5	.02	1	.59												20	.04	3	.96
cf. Gray Squirrel, *Sciurus carolinensis*	2			2	.07	1	3.03		16	1	17	.07	2	2.43								11	1	6	18	.08	4	2.36												37	.07	7	2.25
Fox Squirrel, *Sciurus niger*		1	1	2	.07	1	3.03		3		3	.01	1	1.21			1	1	.03	1	5.55	2	1	3	6	.02	1	.59												12	.02	4	1.28
cf. Fox Squirrel, *Sciurus niger*	1		1	2	.07	1	3.03															3		1	4	.01	2	1.18												6	.01	3	.96
Squirrel, *Sciurus* sp.	9	15	2	26	1.02	2	6.06	39	54	2	95	.41	9	10.97		12	8	20	.73	2	11.11	69	29	48	146	.70	12	7.10		7	7	.60	1	12.50						294	.58	26	8.36
Southern Flying Squirrel, *Glaucomys volans*			1	1	.03	1	3.03																																	1	T	1	.32
Beaver, *Castor canadensis*			2	2	.07	1	3.03	4	10	1	15	.06	2	2.43		3		3	.11	1	5.55	18	2	3	23	.11	2	1.18												43	.08	6	1.92
Rice Rat, *Oryzomys palustris*	2	2		4	.15	1	3.03	1	17		18	.97	1	1.21			3	3	.11	2	11.11	6	1	6	13	.06	3	1.77												38	.07	7	2.25
Mouse, *Peromyscus* sp.	1			1	.03	1	3.03		3		3	.01	1	1.21								1	1	1	3	.01	1	.59												7	.01	3	.96
Hispid Cotton Rat, *Sigmodon hispidus*								1			1	T	1	1.21										1	1	T	1	.59												2	T	2	.64
Eastern Woodrat, *Neotoma floridana*	1			1	.03	1	3.03	1			1	T	1	1.21		1		1	.03	1	5.55	1		1	2	T	1	.59												5	.01	4	1.28
Vole, *Microtus* sp.		1		1	.03	1	3.03		1		1	T	1	. 1.21								1			1	T	1	.59												3	T	3	.96
Pine Vole, *Pitymys pinetorum*																						1		1	2	T	1	.59												2	T	1	.32
Mouse sp.	43	31	4	79	3.11	6	18.18	71	163	2	236	1.03	24	29.26	2		4	6	.22	1	5.55	152	79	75	306	1.47	25	14.79												627	1.25	56	18.00
Domestic Dog, *Canis familiaris*																						1			1	T	1	.59												1	T	1	.32
cf. Dog, *Canis familiaris*		4	1	5	.19	1	3.03	1	2		3	.01	1	1.21	1			1	.03	1	5.55	7	4	3	14	.06	1	.59		15	15	1.28	1	12.50						38	.07	5	1.60
Gray Fox, *Urocyon cinereoargenteus*			1	1	.03	1	3.03			1	1	T	1	1.21								6	1		7	.03	1	.59												9	.01	3	.96
Fox,		1		1	.03	1	3.03		2		2	T	1	1.21																										3	T	2	.64
Black Bear, *Ursus americanus*	16	1	8	25	.98	1	3.03	33	28	2	63	.27	3	3.65	2	3		5	.18	1	5.55	207	27	26	260	1.25	16	9.46		4	4	.34	1	12.50						* 357	.71	22	7.07
cf. Black Bear, *Ursus americanus*	1		2	3	.11	1	3.03															1		1	2	T	1	.59												5	.01	2	.64
Raccoon, *Procyon lotor*	2	1		3	.11	2	6.06	9	18	1	28	.17	3	3.65	1		1	2	.07	1	5.55	28	9	12	49	.23	7	4.14												82	.16	13	4.18
Mink, *Mustela vison*																						1			1	T	1	.59												1	T	1	.32
Striped Skunk, *Mephitus mephitus*																								3	3	.01	1	.59												3	T	1	.32
River Otter, *Lutra canadensis*								1	4		5	.02	1	1.21								1			1	T	1	.59												6	.01	2	.64
Cougar, *Felis concolor*	1	1		2	.07	1	3.03		1		1	T	1	1.21								5		4	9	.04	1	.59												12	.02	3	.96
Bobcat, *Lynx rufus*									1		1	T	1	1.21								4		4	8	.03	1	.59												9	.01	2	.64
Elk, *Cervus canadensis*																						3			3	.01	1	.59												3	T	1	.32
cf. Elk, *Cervus canadensis*	1			1	.03	1	3.03		2		2	T	1	1.21								2			2	T	1	.59												5	.01	3	.96
White-tailed Deer, *Odocoileus virginianus*	74	41	85	200	7.87	5	15.15	219	628	16	863	3.80	19	23.17	40	34	20	94	3.47	5	27.77	1357	184	248	1789	8.62	70	41.42	3	48	51	4.38	3	37.50	3	3	10.00	1	100.00	3000	6.01	103	33.11
cf. White-tailed Deer, *Odocoileus virginianus*																						1			1	T	1	.59												1	T	1	.32
cf. Bison *Bison bison*									1		1	T	1	1.21																										2	T	1	.32
Cow/Elk/Bison *Bos/Cervus/Bison*																						1	1		2	T	1	.59												1	T	1	.32
Antler, Cervidae	4	9	5	18	.70	-		17	85	1	103	.45	-				3	3	.11	-		95	68	267	430	2.07	-			2	2	.17	-							556	1.11	-	
Indeterminate Mammal Bone	411	790	954	2155	84.87	-		1715	19,306	191	21,211	93.39	-		403	1632	520	2661	94.64	-		7916	3339	6315	17,570	84.74	-		7	1074	1081	92.86	-		27	27	90.00	-		44,605	89.39	-	
Total Mammals	570	899	1070	2539	99.81	33	99.99	2116	20,375	219	22,710	99.84	82	99.77	451	1693	562	2706	99.94	18	99.94	9943	3752	7039	20,734	99.80	169	99.92	10	1154	1164	99.96	8	100.00	30	30	100.00	1	100.00	49,883	99.82	311	99.87
Birds																																											
Pied-billed Grebe, *Podilymbus podiceps*																						1			1	.05	1	2.12												1	.02	1	1.03
Canada Goose, *Branta canadensis*																						4	2		6	.31	1	2.12												6	.12	1	1.03
Goose, cf. *Branta* sp.									1		1	.04	1	3.03																										1	.02	1	1.03
Goose sp.,																								1	1	.05	1	2.12												1	.02	1	1.03
Mallard/Black Duck, *Anas* sp.								1	3		4	.17	1	3.03									1		1	.05	1	2.12												5	.10	2	2.06
Pintail/Gadwall Duck, *Anas* sp.																								1	1	.05	1	2.12												1	.02	1	1.03
Teal, *Anas* sp.																						1			1	.05	1	2.12												1	.02	1	1.03
Ringneck/Scaup Duck, *Aythya* sp.									1		1	.04	1	3.03								1			1	.05	1	2.12												2	.04	2	2.06
Duck sp. Anatidae								1	2		3	.13	1	3.03								3	1	1	5	.26	1	2.12		1	1	2.00	1	50.00						9	.18	3	3.09
cf. Tu key Vulture, *Cathartes aura*																						1			1	.05	1	2.12												1	.02	1	1.03
Coopers Hawk, *Accipiter cooperii*																						3			3	.15	1	2.12												3	.06	1	1.03
Red-tailed Hawk, *Buteo jamaicensis*									6		6	.26	1	3.03										2	2	.10	1	2.12												8	.16	2	2.06
Red-shouldered Hawk, *Buteo lineatus*																						1			1	.05	1	2.12												1	.02	1	1.03
cf. Red-shouldered Hawk, *Buteo lineatus*									1		1	.04	1	3.03																										1	.02	1	1.03
Hawk sp.									8		8	.35	1	3.03																										8	.16	1	1.03
Ruffed Grouse, *Bonasa umbellus*																						3			3	.15	2	4.25												3	.06	2	2.06
Bobwhite, *Colinus virginianus*		1		1	.33	1	12.50	1	2		3	.13	1	3.03								1	5	3	9	.47	1	2.12												13	.26	3	3.09
Turkey, *Meleagris gallopavo*	12	9	11	32	10.56	4	50.00	25	26	8	59	2.64	5	15.15	8	18	9	35	7.04	3	42.85	163	31	53	247	13.11	21	44.68		3	3	6.00	1	50.00						376	7.57	34	35.05
cf. Turkey, *Meleagris gallopavo*		1		1	.33	1	12.50	6	1		7	.31	2	6.06	2	1		3	.60	1	14.28	7	3	7	17	.90	2	4.25												28	.58	6	6.18
Sandhill Crane, *Grus canadensis*			1	1	.33	1	12.50															1	1		2	.10	1	2.12												3	.06	2	2.06
cf. Sandhill Crane, *Grus canadensis*								1			1	.04	1	3.03	1			1	.20	1	14.28	2			2	.10	1	2.12												4	.08	3	3.09
Virginia Rail, *Rallus limicola*								1			1	.04	1	3.03																										1	.02	1	1.03
cf. Greater Yellowlegs, *Totanus melanoleucus*																																											
Small Sandpiper, Scolopacidae																						1			1	.05	1	2.12												1	.02	1	1.03
Passenger Pigeon, *Ectopistes migratorius*								1	86		87	3.90	12	36.36								3	1	8	12	.63	2	4.25												99	1.99	14	14.43

Table 2 (continued)

Species	West Village Midden	Structure	Feature	Total	%	MNI	%	North Village Midden	Structure # 3	Feature	Total	%	MNI	%
Birds (continued)														
cf. Passenger Pigeon, Ectopistes migratorius									4		4	.17	1	3.03
Screech Owl, Otus asio														
Barred Owl, Strix varia														
Crow, Corvus brachyrhynchos														
Cardinal, Richmondena cardinalis									1		1	.04	1	3.03
Passerine sp.	3	3	1	7	2.31	1	12.50		15	2	17	.76	2	6.06
Indeterminate Bird Bone	111	72	78	261	86.13	-		236	1746	43	2025	90.84	-	
Eggshell														
Total Birds	126	86	91	303	99.99	8	100.00	273	1903	53	2229	99.90	33	99.99
Reptiles														
Snapping Turtle, Chelydra serpentina		1	4	5	.53	1	3.03	1	4	1	6	.13	1	1.85
cf. Stinkpot, Sternotherus odoratus	2			2	.21	1	3.03	5	2		7	.15	1	1.85
Mud Turtle, Kinosternon subrubrum														
Mud/Musk Turtle, Kinosternidae			3	3	.31	1	3.03		22		22	.47	2	3.70
Eastern Box Turtle, Terrapene carolina	216	187	188	591	12.93	27	81.81	361	1029	71	1461	31.70	41	75.92
Map Turtle, Graptemys sp.		1		1	.10	1	3.03	1			1	.02	1	1.85
Slider/Cooter Turtle, Chrysemys sp.								2	1		3	.06	1	1.85
Map/Slider Turtle, Graptemys/Chrysemys sp.		1	2	3	.31	1	3.03	19	26		45	.97	3	5.55
cf. Spiney Softshell Turtle, Trionyx spiniferus									1		1	.02	1	1.85
Softshell Turtle, Trionyx sp.		1	2	3	.31	1	3.03	14	72	2	88	1.90	3	5.55
Turtle sp.	44	78	86	208	22.15	-		129	2300	6	2435	52.84	-	
Nonpoisonous Snakes, Colubridae	22	27	6	59	6.28	-		64	301		365	7.92	-	
Poisonous Snakes, Viviparidae	2	8	2	12	1.27	-		14	46		60	1.30	-	
Snake sp.	26	25	1	52	5.53	-		62	52		114	2.47	-	
Total Reptiles	316	329	294	939	99.93	33	99.99	672	3856	80	4608	99.95	54	99.97
Amphibians														
Hellbender, Cryptobranchus alleganiensis		2		2	5.71	1	14.28		10		10	7.87	1	5.55
Eastern Spadefoot Toad, Scaphiopus holbrooki	5	2		7	20.00	2	28.57	16	19		35	27.55	7	38.88
Bullfrog, Rana catesbiana									2		2	1.57	1	5.55
Frog, Rana sp.	2	1		3	8.57	1	14.28	2	20		22	17.32	4	22.22
Toad, Bufo sp.	3	2		5	14.28	1	14.28	2	11		13	10.23	2	11.11
Frog/Toad, Rana/Bufo	11	7		18	51.42	2	28.57	19	25	1	45	35.43	3	16.66
Total Amphibians	21	14		35	99.98	7	99.98	39	87	1	127	99.97	18	99.97
Fishes														
Sturgeon, Acipenser sp.		1		1	.18	1	7.69							
cf. Longnose Gar, Lepisosteus osseus									1		1	.05	1	4.16
Gar, Lepisosteus sp.	3	5	1	9	1.62	1	7.69	12	9		21	1.13	1	4.16
Pike, Esox sp.									1		1	.05	1	4.16
Minnow, Cyprinidae								1			1	.05	1	4.16
River Redhorse, Moxostoma carinatum	1	6	1	8	1.44	1	7.69	4	22		26	1.40	2	8.33
cf. River Redhorse, Moxostoma carinatum														
cf. Shorthead Redhorse, Moxostoma macrolepidotum														
Redhorse, Moxostoma sp.	2	11	2	15	2.70	2	15.38	19	42	2	63	3.41	5	20.83
Buffalo, Ictiobus sp.														
Sucker, Catostomidae	2	16		18	3.24	1	7.69	16	85	2	103	5.58	4	16.66
Channel/Blue Catfish, Ictalurus sp.		1	2	3	.54	2	15.38	2			2	.10	1	4.16
Catfish/Bullhead, Ictalurus sp.		1		1	.18	1	7.69	1	3		4	.20	1	4.16
Flathead Catfish, Pylodictis olivaris														
Madtom, Noturus sp.		1		1	.18	1	7.69							
Catfish, Ictaluridae								3			3	.16	1	4.16
Bass, Micropterus sp.			1	1	.18	1	7.69	1	2		3	.16	1	4.16
Sunfish/Bass, Centrarchidae								2	2		4	.20	1	4.16
Sauger/Walleye, Stizostedion sp.														
Freshwater Drum, Aplodinotus grunniens	14	7	1	22	3.97	2	15.38	58	55		113	6.12	4	16.66
Indeterminate Fish Bone	36	131	47	214	38.62	-		191	1048	21	1260	68.32	-	
Fish Scales	18	206	37	261	47.11	-		102	133	4	239	12.96	-	
Total Fish	76	386	92	554	99.96	13	99.97	412	1403	29	1844	99.89	24	99.92
Grand Total	1104	1714	1547	4370		94		3512	27,624	382	31,518		211	

Species	Mound A Midden	Structure	Feature	Total	%	MNI	%	East Village Midden Midden	Structure	Feature	Total	%	MNI	%
Birds (continued)														
cf. Passenger Pigeon, Ectopistes migratorius														
Screech Owl, Otus asio	2			2	.40	1	14.28							
Barred Owl, Strix varia								3			3	.15	1	2.12
Crow, Corvus brachyrhynchos								1		1	2	.10	1	2.12
Cardinal, Richmondena cardinalis														
Passerine sp.			2	2	.40	1	14.28	8	2	4	14	.74	2	4.25
Indeterminate Bird Bone	58	303	88	449	90.34	-		760	202	580	1542	81.84	-	
Eggshell			5	5	1.00	-			2	4	6	.31	-	
Total Birds	71	322	104	497	99.98	7	99.97	968	251	665	1884	99.87	47	99.84
Reptiles														
Snapping Turtle, Chelydra serpentina	1	1		2	.66	1	6.66	4	5	5	14	.27	1	.54
cf. Stinkpot, Sternotherus odoratus								6	1	5	12	.23	1	.54
Mud Turtle, Kinosternon subrubrum								2			2	.03	1	.54
Mud/Musk Turtle, Kinosternidae	1		1	2	.66	1	6.66	7	5	17	29	.57	2	1.09
Eastern Box Turtle, Terrapene carolina	42	16	158	216	71.28	11	73.33	1607	320	1192	3119	61.36	167	91.75
Map Turtle, Graptemys sp.								2		1	3	.05	1	.54
Slider/Cooter Turtle, Chrysemys sp.								1	2		3	.05	1	.54
Map/Slider Turtle, Graptemys/Chrysemys sp.		6		6	1.98	1	6.66	32	9	31	72	1.41	4	2.19
cf. Spiney Softshell Turtle, Trionyx spiniferus														
Softshell Turtle, Trionyx sp.	1		1	2	.66	1	6.66	38	12	11	61	1.20	4	2.19
Turtle sp.	25	14	31	70	23.10	-		357	263	549	1169	22.99	-	
Nonpoisonous Snakes, Colubridae	2			2	.66	-		113	104	99	316	6.21	-	
Poisonous Snakes, Viviparidae			2	2	.66	-		36	31	28	95	1.86	-	
Snake sp.			1	1	.33	-		98	46	44	188	3.69	-	
Total Reptiles	72	37	194	303	99.99	15	99.99	2303	798	1982	5083	99.92	182	99.92
Amphibians														
Hellbender, Cryptobranchus alleganiensis			1	1	1.63	1	20.00	2	3	8	13	5.30	1	4.76
Eastern Spadefoot Toad, Scaphiopus holbrooki	32		1	33	54.09	2	40.00	7		36	43	17.55	5	23.80
Bullfrog, Rana catesbiana								5	3	2	10	4.08	2	9.52
Frog, Rana sp.								10	2	4	16	6.53	4	19.04
Toad, Bufo sp.	11		2	13	21.31	1	20.00	13	4	13	30	12.24	3	14.28
Frog/Toad, Rana/Bufo	8	3	3	14	22.95	1	20.00	50	38	45	133	54.28	6	28.57
Total Amphibians	51	3	7	61	99.98	5	100.00	87	50	108	245	99.98	21	99.97
Fishes														
Sturgeon, Acipenser sp.								1			1	.03	1	1.78
cf. Longnose Gar, Lepisosteus osseus														
Gar, Lepisosteus sp.		1		1	.02	1	9.09	33	7	90	130	4.52	1	1.78
Pike, Esox sp.								1		1	2	.06	1	1.78
Minnow, Cyprinidae								3		3	6	.20	6	10.71
River Redhorse, Moxostoma carinatum	1	12	2	15	.36	1	9.09	20	7	9	36	1.25	7	12.50
cf. River Redhorse, Moxostoma carinatum								8			8	.27	4	7.14
cf. Shorthead Redhorse, Moxostoma macrolepidotum								1			1	.03	1	1.78
Redhorse, Moxostoma sp.	4	12	14	30	.72	2	18.18	61	11	27	99	3.44	7	12.50
Buffalo, Ictiobus sp.			1	1	.02	1	9.09							
Sucker, Catostomidae	6	13	29	48	1.15	2	18.18	53	17	87	157	5.46	5	8.92
Channel/Blue Catfish, Ictalurus sp.		3	1	4	.09	1	9.09	3	1		4	.13	2	3.57
Catfish/Bullhead, Ictalurus sp.								2		3	5	.17	3	5.35
Flathead Catfish, Pylodictis olivaris								1		3	4	.13	2	3.57
Madtom, Noturus sp.														
Catfish, Ictaluridae	2	1		3	.07	1	9.09	10	1		11	.38	2	3.57
Bass, Micropterus sp.								5	1	5	11	.38	2	3.57
Sunfish/Bass, Centrarchidae								1		2	3	.10	2	3.57
Sauger/Walleye, Stizostedion sp.								4		6	10	.34	3	5.35
Freshwater Drum, Aplodinotus grunniens	7	2	11	20	.48	2	18.18	74	37	47	154	5.50	7	12.50
Indeterminate Fish Bone	47	158	325	530	12.78	-		462	242	520	1224	42.63	-	
Fish Scales			3493	3493	84.27			64	362	575	1001	34.86	-	
Total Fish	67	202	3876	4145	99.96	11	99.99	807	686	1378	2871	99.88	56	99.94
Grand Total	712	2257	4743	7712		56		14,108	5537	11,172	30,817		475	

Species	East Village Structure	Feature	Total	%	MNI	%	Mound B Feature	Total	%	MNI	%	Total [illegible] Total	%	MNI	%
Birds (continued)															
cf. Passenger Pigeon, Ectopistes migratorius												4	.08	1	1.03
Screech Owl, Otus asio												2	.04	1	1.03
Barred Owl, Strix varia												3	.06	1	1.03
Crow, Corvus brachyrhynchos												2	.04	1	1.03
Cardinal, Richmondena cardinalis												1	.02	1	1.03
Passerine sp.												40	.80	6	6.18
Indeterminate Bird Bone		46	46	92.00	-		2	2	100.00	-		4325	87.10	-	
Eggshell												11	.22		
Total Birds		50	50	100.00	2	100.00	2	2	100.00	-	-	4965	99.96	97	99.95
Reptiles															
Snapping Turtle, Chelydra serpentina												27	.24	4	1.38
cf. Stinkpot, Sternotherus odoratus	1	2	3	1.62	1	20.00						24	.21	4	1.38
Mud Turtle, Kinosternon subrubrum												2	T	1	.34
Mud/Musk Turtle, Kinosternidae												56	.50	6	2.07
Eastern Box Turtle, Terrapene carolina		142	142	76.56	3	60.00						5529	49.73	249	86.15
Map Turtle, Graptemys sp.												5	.04	3	1.03
Slider/Cooter Turtle, Chrysemys sp.												6	.05	2	.69
Map/Slider Turtle, Graptemys/Chrysemys sp.												126	1.13	9	3.11
cf. Spiney Softshell Turtle, Trionyx spiniferus												1	T	1	.34
Softshell Turtle, Trionyx sp.		3	3	1.62	1	20.00						157	1.41	10	3.46
Turtle sp.		32	32	17.29	-							3914	35.20	-	
Nonpoisonous Snakes, Colubridae		1	1	.54	-							743	6.68	-	
Poisonous Snakes, Viviparidae		1	1	.54	-							170	1.54	-	
Snake sp.		3	3	1.62	-							358	3.22	-	
Total Reptiles	1	184	185	99.79	5	100.00						11,118	99.93	289	99.95
Amphibians															
Hellbender, Cryptobranchus alleganiensis		1	1	33.33	1	50.00						27	5.73	5	9.43
Eastern Spadefoot Toad, Scaphiopus holbrooki												118	25.05	16	30.18
Bullfrog, Rana catesbiana												12	2.34	3	5.66
Frog, Rana sp.												41	8.70	9	16.98
Toad, Bufo sp.												61	12.95	7	13.20
Frog/Toad, Rana/Bufo		2	2	66.66	1	50.00						212	45.00	13	24.52
Total Amphibians		3	3	99.99	2	100.00						471	99.98	53	99.97
Fishes															
Sturgeon, Acipenser sp.												2	.02	2	1.83
cf. Longnose Gar, Lepisosteus osseus												1	.01	1	.91
Gar, Lepisosteus sp.												161	1.70	4	3.66
Pike, Esox sp.												3	.03	2	1.83
Minnow, Cyprinidae												7	.07	7	6.42
River Redhorse, Moxostoma carinatum												85	.89	11	10.09
cf. River Redhorse, Moxostoma carinatum												8	.08	4	3.66
cf. Shorthead Redhorse, Moxostoma macrolepidotum												1	.01	1	.91
Redhorse, Moxostoma sp.												207	2.19	16	14.67
Buffalo, Ictiobus sp.												1	.01	1	.91
Sucker, Catostomidae		2	2	5.71	1	20.00						328	3.47	13	11.92
Channel/Blue Catfish, Ictalurus sp.												13	.13	6	5.50
Catfish/Bullhead, Ictalurus sp.												10	.10	5	4.58
Flathead Catfish, Pylodictis olivaris												4	.04	2	1.83
Madtom, Noturus sp.												1	.01	1	.91
Catfish, Ictaluridae												17	.17	4	3.66
Bass, Micropterus sp.												15	.15	4	3.66
Sunfish/Bass, Centrarchidae		1	1	2.85	1	20.00						8	.08	4	3.66
Sauger/Walleye, Stizostedion sp.												10	.10	3	2.75
Freshwater Drum, Aplodinotus grunniens		5	5	14.28	3	60.00						318	3.36	18	11.51
Indeterminate Fish Bone		23	23	65.71	-		1	1	100.00	-	-	3252	34.41	-	
Fish Scales		4	4	11.42	-							4998	52.88	-	
Total Fish	0	35	35	99.97	5	100.00	1	1	100.00	-	-	9450	99.91	109	99.87
Grand Total	11	1426	1437		22		33	33		1		75,887		859	

Table 3: Tabulation of the Number of Dallas Features, Structures and Midden Units by Village Area.

Village Area	Structures	Features	Midden
North Village	1	7	52
West Village	5	20	12
East Village Midden	14	75	166
East Village	3	17	-
Mound A	5	18	45
Mound B	-	3	-
Total	28	140	275

arbitrary groups of animals: food species, intrusive animals and "ceremonial" nonfood animals. Animals assumed to be intrusive include the mole, rice rat, pine vole, wood rat and indeterminate mice. These animals lived in and around the village, probably in the houses at times, in refuse pits and in the midden; upon their death their bones became a part of the culturally accumulated faunal debris.

Mammals that were probably not food items, but rather those having a special significance, include the mustelids and felids. One mink, six river otter and three skunk elements were the only mustelid remains encountered other than those from skin bundles (mink, weasel) associated with burials. The burned river otter remains from Structure 3 (right and left jaw, right maxillary, distal right humerus) probably represent the remains of a skin bundle left in Structure 3 when the structure burned. The right maxilla fragment of a river otter from the East Village Midden Area may also have been from a discarded river otter skin. The isolated mink element is a right radius. The three stripped skunk pieces (right maxilla, right and left jaws) are all from the same feature in the East Village Midden and may possibly have been from a skin personal bundle (e.g. Swanton 1946:48). The metapodials, some tail vertebrae and often the anterior portion of the skull and jaws were left in animal skins that were carried as pouches or bundles. The mustelid remains from Toqua burial associations, structures, midden and features were primarily skulls and jaws. The predominance of cranial elements and their association with burials, coupled with the low incidence of mustelid remains in the village midden, suggests a special or significant role of these animals in the Dallas culture. The two felids, the cougar and bobcat, are represented only by a few elements. The 12 cougar bones represent major parts of the animal. The skin of this felid was worn, the claws used as ornaments and the meat was sometimes eaten (Swanton 1946:250). The bobcat remains (nine elements) probably represent animals taken for their skins and meat. The distal end of a right bobcat ulna was sharpened to a point.

The canid remains from Toqua can be divided into two groups: isolated bones scattered across the site and three intentional dog burials. However, the three burials could not be definitely associated with either the Dallas or Cherokee occupation (Parmalee and Bogan 1978:103). Isolated dog elements found throughout the site may indicate that dogs were occasionally eaten. Parmalee and Bogan (1978:108-110) described the three dog burials which compared very closely in size to Mississippian dogs measured by Haag (1948). The gray fox was probably taken occasionally for food and for its pelt which may have been used as a pouch (Swanton 1946:250).

Twelve mammal species may be considered food items; the bulk of the meat was supplied by the white-tailed deer. Small animals such as the opossum, cottontail, southern flying squirrel and the tree squirrels (Sciurus) would have provided skins and small amounts of meat. Speck (1909:19) reported that the Yuchi hunted deer, bison, bear, raccoon, opossum, rabbit and squirrel mainly for skins, but that they were also eaten. He commented that deer sinew or strips of squirrel skin were used for bow strings (Speck 1909:20). The supplemental dietary role of these small animals has been noted for other archaeological samples in the Southeast (Bogan 1976; 1980; Robison 1977; van der Schalie and Parmalee 1960:50; Weigel et al. 1974).

Beaver, raccoon and woodchuck played important roles in the diet of the prehistoric inhabitants of eastern North America as evidenced by their presence in faunal assemblages (Guilday and Tanner 1962; Parmalee 1965; Parmalee et al. 1972). They also played a supplementary role in historic Cherokee and Yuchi diets (Bogan 1976:80; 1980; Speck 1909:19). Remains of these three medium-sized mammals, which would have provided a source of meat, raw materials for tools and skins, have an interesting distribution across the site (Table 2). Woodchuck elements were found only in the East Village Midden Area. The beaver elements from the West Village consisted of a skull fragment and an isolated tooth (4.65% of the total beaver elements), and from Mound A, a clavicle, tibia and calcaneum (6.97%). This is in contrast to the 15 beaver elements (34.88%) from North Village and the 23 (53.48%) from East Village Midden. Only one or two individual beaver were represented. Raccoon remains exhibit a similar distribution. West Village contained three elements (3.65% of the raccoon elements), a left jaw, isolated molar and a distal humerus, while a left jaw and an isolated tooth (2.43%) were found in Mound A. The 15 raccoon remains from North Village (34.14%) and the 49 elements from East Village Midden (59.75%) represented all portions of the skeleton. Raccoon MNI were: West Village 2; North Village 3; Mound A 1; East Village Midden 7. The distribution of the raccoon MNI corresponded to the distribution of elements by village area.

The white-tailed deer was the meat staple and provided the major source of raw materials for bone artifacts for the aboriginal inhabitants of eastern North America. The literature is replete with references to the role of the deer in ethnohistoric cultures (e.g. Gilbert 1943:185; Hudson 1976:274; Speck 1909:19; 1928:330; Swanton 1946:249), its significance in prehistoric subsistence (Munson et al. 1971; Parmalee 1968; 1975; Parmalee et al. 1972; Smith 1975; 1978:99-101; van der Schalie and Parmalee 1960), and its varied uses by ethnohistoric groups (Bogan 1976; 1980; Guilday 1970; Guilday et al. 1962).

The bear was often second to the deer in importance as a food item and as a source of bones and hides. The importance of the deer and bear in the Dallas subsistence is obvious (Table 2, pp. 33). Elements of these two species dominate the identified mammalian remains and their respective MNI are the largest for food animals. These two animals are large and one individual would have supplied a sizable amount of meat. The distribution of the elements of these two major food species across the five village areas provide a test of the proposition concerning redistribution of food items in a chiefdom and the proposed differential access to food or at least cuts of meat of major food species, according to status.

The distribution of deer and bear remains were examined to test the proposition that there was a differential access to either the food animal or particular cuts of meat. If there was differential access to cuts of meat during the Dallas occupation, the distribution of the deer and bear elements should reflect this pattern. The 3000 deer and 357 bear bone pieces were partitioned by village area and by respective anatomical element (Tables 4, 5). The deer elements were arranged by 23 variables and the bear data by 22 variables, then both data sets were divided into 5 cases (village areas). These two data sets were then subjected to an agglomerative cluster analysis using the BMDP2M program (Dixon and Brown 1979:633-642). The data were clustered using both the chi square and phi square options; the resulting dendograms and the amalgamation distances are presented in Figure 4.

Table 4: White-tailed Deer Remains by Village Area.

Element	West Village N	West Village %	North Village N	North Village %	Mound A N	Mound A %	East Village Midden N	East Village Midden %	East Village N	East Village %	Mound B N	Mound B %	Total N	Total %
Skull	90	45.00	279	32.32	14	14.89	355	19.84	16	31.37	2	66.66	756	25.20
Cervical vertebrae	2	1.00	8	.92			37	2.06					47	1.56
Vertebrae	3	1.50	10	1.15	8	8.51	49	2.73	5	9.80			75	2.50
Ribcage	2	1.00	4	.46	8	8.51	32	1.78					46	1.53
Scapula	4	2.00	21	2.43	2	2.12	86	4.80					113	3.76
Proximal humerus							10	.55	1	1.96			11	.36
Distal humerus	5	2.50	18	2.08	9	9.57	118	6.59	1	1.96			151	5.03
Proximal radius/ulna	10	5.00	33	3.82	11	11.70	136	7.60	3	5.88			193	6.43
Distal radius/ulna	2	1.00	7	.81	3	3.19	60	3.35	2	3.92	1	33.33	75	2.50
Carpal	5	2.50	55	6.37	2	2.12	22	1.22	3	5.88			87	2.90
Metacarpal	5	2.50	11	1.27	3	3.19	113	6.31	1	1.96			133	4.43
Pelvis	6	3.00	26	3.01	3	3.19	64	3.57	3	5.88			102	3.40
Proximal femur			5	.57	2	2.12	9	.50					16	.53
Distal femur	1	.50	3	.34			15	.83					19	.63
Patella			6	.69	1	1.06	8	.44					15	.50
Proximal tibia			6	.69	2	2.12	29	1.62					37	1.23
Distal tibia	8	4.00	31	3.59	4	4.25	104	5.81	3	5.88			150	5.00
Calcaneum	8	4.00	36	4.17	5	5.31	95	5.31	1	1.96			145	4.83
Astragalus	5	2.50	31	3.59	5	5.31	71	3.96					112	3.73
Tarsal	3	1.50	33	3.82	3	3.19	31	1.73	4	7.84			74	2.46
Proximal metatarsal	9	4.50	19	2.20	1	1.06	65	3.63	2	3.92			96	3.20
Metapodial	11	5.50	38	4.40	2	2.12	76	4.24	1	1.96			128	4.26
Phalanges	21	10.50	183	21.20	6	6.38	204	11.40	5	9.80			419	13.96
Total	200	100.00	863	99.90	94	99.91	1789	99.87	51	99.97	3	99.99	3000	99.93

Table 5: Bear Remains by Village Area.

Element	West Village N	West Village %	North Village N	North Village %	Mound A N	Mound A %	East Village Midden N	East Village Midden %	East Village N	East Village %	Total N	Total %
Skull			2	3.17			6	2.30	1	25.00	9	2.52
Jaws			3	4.76			21	8.07			24	6.72
Teeth	2	8.00	10	15.87			31	11.92			43	12.04
Atlas							2	.76			2	.56
Cervical vertebrae			1	1.58							1	.28
Ribs							1	.38			1	.28
Humerus	1	4.00	2	3.17			27	10.38	1	25.00	31	8.68
Ulna			4	6.34			22	8.46			26	7.28
Radius	1	4.00	2	3.17			26	10.00			29	8.12
Carpals	1	4.00	2	3.17			2	.76			5	1.40
Metacarpals	3	12.00	8	12.69	1	20.00	9	3.46			21	5.88
Pelvis	3	12.00					3	1.15			6	1.68
Femur							10	3.84			10	2.80
Fibula	1	4.00	2	3.17	1	20.00	17	6.53			21	5.88
Tibia			2	3.17			10	3.84			12	3.36
Patella			1	1.58							1	.28
Calcaneum	1	4.00	2	3.17			6	2.30	1	25.00	10	2.80
Astragalus			1	1.58			6	2.30			7	1.96
Metatarsal	5	20.00	3	4.76	1	20.00	10	3.84			19	5.32
Metapodial	1	4.00	7	11.11	1	20.00	19	7.37	1	25.00	29	8.12
Phalanges	6	24.00	11	17.46			30	11.53			47	13.16
Baculum					1	20.00	2	.76			3	.84
Total	25	100.00	63	99.92	5	100.00	260	99.95	4	100.00	357	99.96

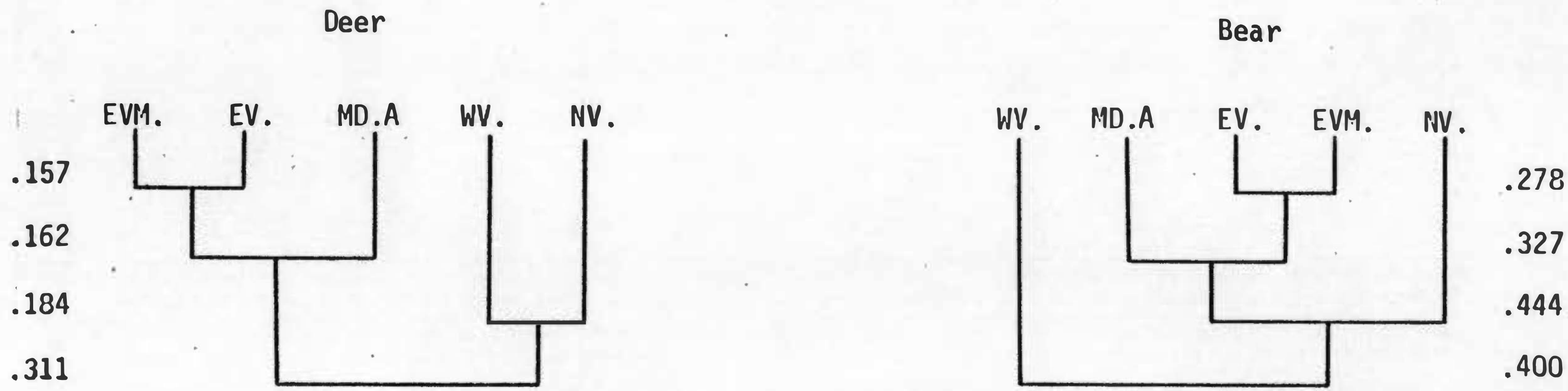

Figure 4. Dendrogram of Deer and Bear Elements, Clustered by Village Area.

The deer remains separate out into two major clusters. The East Village (EV.), East Village Midden (EVM.) and Mound A (MD.A.) remains grouped together, while those from West Village (WV.) and North Village (NV.) were combined. The sample from West Village, Mound A and East Village were relatively small in comparison with the other two samples. The sample of deer remains from West Village was dominated by isolated teeth and skull fragments (45% of the sample).

The anatomical portions of the deer tabulated included the skull, vertebrae and ribs, upper front leg (scapula to the proximal radius shaft and ulna), lower front leg (distal radius, carpals and metacarpals), pelvis, upper hind leg (femur to the proximal tibia shaft) and lower hind leg (distal tibia, tarsals and phalanges). In West Village and North Village 83% of the deer bone is represented by skull fragments and lower legs, closely followed by East Village where 74% of the remains were skull and lower leg elements. The deer skull and lower leg remains from Mound A comprise only 51% and from East Village Midden, 66%. By considering the location of muscle mass of the front and hind legs, an interesting pattern emerges. The percentage of elements from the front leg by village areaaare West Village, 9.5%; North Village, 8.5%; Mound A, 23.38%; East Village Midden, 20.07%; East Village, 9.8% (Table 3, pp. 35); values for the hind leg are West Village, 0.5%; North Village, 2.29%; Mound A, 5.3%; East Village Midden, 3.39%; East Village, 0%. Examination of these figures clearly illustrates the point that cuts of meat were not evenly distributed across the site. Occupants of West Village and East Village were receiving mainly the skulls and other less meaty sections of the deer carcass. Also, there was a higher incidence of vertebrae and ribs in the mound sample. The intriguing distribution occurs with the sections of the front and hind leg whihc have the most meat. Considering the percentages of deer bone per village area, those of the hind leg are highest in Mound A, absent from East Village and very low for West Village. North Village and East Village Midden are quite close. Bones of the front leg have a different distribution. These elements comprise only 8.5-9.8% of West, North and East Village samples, while they constitue 20% and 23% of East Village Midden and Mound A samples, respectively.

The picture that emerges is that East and West Villages received a minimal amount of deer meat and then only the less meaty portions such as the skull. Thr front leg was more evenly distributed, but was considered a more prestigious cut with a larger percent going to the high status groups in East Village Midden and those people living in East Village Midden, on Mound A and in North Village. North Village (Structure 3) is considered a special function structure (men's house?--a meeting place for men including individuals of high and low status). This may explain the close resemblance in some ways to a low status diet but with some "high status" food items such as waterfowl and passenger pigeon (Table 2, pp. 33).

The bear remains were tabulated by anatomical unit and village area (Table 5) and then clustered, using the same techniques as employed with the deer elements. The samples from Mound A and East Village were both extremely small. The normalized dendrogram (Figure 4) closely groups East Village, East Village Midden and Mound A, while the samples from West Village and North Village are closely related. This pattern is the same as the one for the distribution of deer remains. The bear is poorly represented in East Village and the elements in the small mound sample consist mainly of foot bones. An interesting comparison of elements between the three remaining village areas may be seen. Skull fragments teeth and jaws represented 22% and 23% of the bear elements in North Village and East Village Midden, respectively. This concentration suggests a limited access to the use of bear skulls. Bear paws represented by carpals, metacarpals, tarsals, metatarsals and phalanges were present in all three sections. The highest concentration was in West Village (68% of the bear sample), 53% in North Village and 31.5% in East Village Midden. The opposite trend was noted in the distribution of the front leg (humerus, radius and ulna): West Village 8%, North Village 12.69%, East Village Midden 28.84%; in the case of the hind leg (femur, tibia, fibula): West Village 4%, North Village 7.93%, East Village Midden 14.23%. This suggests the front and hind legs, possessing the majority of meat, were being obtained primarily by the occupants of East Village Midden Area, to a lesser degree by those in the North Village and to the almost exclusion of persons of East Village and West Village areas. Historically, bear paws were considered a delicacy and a source of good oil (Hudson 1976:279) but, show a cline in the opposite direction from the deer and other cuts of the bear with the highest concentration of bear paws in West Village to the lowest in East Village Midden Area.

An examination of the distribution of all elements of the deer and bear across the five village areas by cluster analysis has brought out a significant grouping of the remains by village area. Further examination of the data by anatomical units between village areas revealed an uneven distribution of deer and bear elements by village area, supporting the proposition that in a ranked society there would be an uneven distribution of the animal protein resources as evidenced by the distribution of the cuts of meat of the major food animals.

Other large mammals, e.g. elk and bison, although providing large quantities of meat at one time, were apparently not often taken. Only one possible bison incisor was identified and a distal humerus was identified only as a large herbivore. Elk remains included two teeth, two lumbar vertebrae, two proximal phalanges, a proximal tibia and a right tarsal. The possible bison element and all but one of the elk remains were found in North Village and East Village Midden; a single elk tarsal occurred in West Village. The elk remains in North Village included an incisor and a proximal phalanx. Although based on very scant evidence, the large herbivores can be viewed as having had a meat distribution pattern similar to the one exemplified by the deer bones.

Summary of Mammal Remains

Animal species comprising the mammalian portion of the meat diet at Toqua are the same as those reported from many other sites in the eastern United States. The meat diet was dominated by deer, followed by the bear and supplemented by woodchuck, beaver, raccoon, opossum and elk. Bones of the white-tailed deer were concentrated in the East Village Midden Area, but considering the distribution of elements and cuts of meat, the front leg elements were found to be concentrated in the Mound A and East Village Midden areas with low numbers in the West, North and East Village areas. The hind leg elements were similarly distributed with their highest concentration occurring in Mound A. The differential access to cuts of meat and differences in the distribution of meat was also seen in the case of bear remains. The medium-sized mammals, woodchuck, beaver and raccoon, also seem to follow the distribution pattern exhibited by the deer. Although the samples of each of these species were small, the highest percentage of the beaver, raccoon and woodchuck remains occurred in East Village Midden, followed by North Village. The few elk elements recovered from the Toqua excavations seem to indicate a similar partitioning of this animal, that is, the major meat bearing elements going to East Village Midden and the hock joint going to West Village. The mammal remains, in addition to documenting the white-tailed deer as the Dallas meat staple and the important role of the bear, show some interesting patterns suggesting redistribution of protein resources among the former site inhabitants.

Birds

Avian remains comprised only 6.54% of the total Dallas vertebrate faunal sample, although the 22 species identified in this sample suggest several different modes of use. The most common bird was the turkey, which provided the main avian meat resource, feathers and bones for such tools as the tarsometatarsal awl. Archaeologically and ethnohistorically, the turkey provided a major source of meat (Guilday et al. 1962; Speck 1909:19; Swanton 1946:251). Turkey remains were concentrated in East Village Midden Area and almost equally distributed throughout Mound A, West and North Village areas. The bobwhite and ruffed grouse would have provided only a minor food supplement. The pied-billed grebe and waterfowl provided only a minor seasonal food supplement; they were represented in North Village (primarily in Structure 3) and in the East Village Midden Area. East Tennessee is not within a major waterfowl flyway and these birds were probably never locally abundant, although these aquatic species would undoubtedly have been hunted when they appeared during migration. The restricted distribution of waterfowl elements suggests a limited access to the use of ducks and geese (Table 2, pp. 33). Seven elements could be referred to the sandhill crane; this large bird would have provided some meat, but it may have been prized more for its feathers or for its role in a symbolic or ceremonial capacity. The crane skull was found in association with a mink skull in a Mound A burial.

Raptors identified in the sample were probably not taken strictly as a food item but rather for use as symbolic or ceremonial skins. These birds are the prominent avian forms depicted in the iconography of Southern Cult shell and copper items (Phillips and Brown 1978). The red-tailed and red-shouldered hawk remains consist of elements that would be expected in a prepared bird skin: tarsometatarsi, ulna, carpometacarpi and digits. Ubelaker and Wedel (1975) have documented the archaeological visibility of bird skin bundles and illustrate the avian elements left in historically collected Native American bird skins. Indeterminate hawk elements consisted of claws and digits. The screech owl was represented by a right ulna and radius, possibly a wing fan consisting of the secondary flight feathers. The barred owl elements, an ulna, carpometacarpus and tibiotarsus, might be expected in a prepared owl skin. The humerus, coracoid and scapula from a Cooper's hawk may represent the discards from the preparation of the skin or leftovers from a meal. All raptor remains were recovered in Structure 3 (North Village) and East Village Midden.

Gilbert (1943:346) and Adair (Williams 1930:137) commented that the Cherokee considered birds of prey and birds of the night unclean and not to be eaten. Hawk feathers and skins were used as ornaments and were invoked in curing diseases (Swanton 1946:251; Witthoft 1946b:376-377). Creek shamans carried owl skins as a symbol of office (Swanton 1946:252). The Cherokee felt that owls were witches or connected with the supernatural and were also considered unfit to eat (Witthoft 1946a:180). The ethnohistoric literature documents the Indians destain for the flesh of raptors but the importance of their symbolic and ceremonial uses. The restriction of raptor remains recovered from the Dallas occupation to the large structure and East Village Midden, both considered high status or special function areas, suggests the Dallas people had a similar feeling for raptors.

A bone bead tentatively identified as turkey vulture was manufactured from the shaft of an ulna; its shape, size and the location of the papillae compare favorably with those of a turkey vulture ulna. This bead may have been thought to carry the turkey vulture's immunity to disease (Witthoft 1946b:377).

The virginia rail and a small sandpiper, each represented by a single element,were probably taken as food items. The Cherokee used shore birds in medicine. These birds may have been used in curing disease as opposed to a food item (Witthoft 1946b:378).

The passenger pigeon was a very important avian food item, second only to the turkey among many of the historic eastern North American Indian tribes (Schorger 1955:133-140; Swanton 1946:298-299). The pigeon was present in the Tennessee area during the late fall and winter, but there are no valid records of it nesting in the state (Schorger 1955:265, 280). Interestingly, the pigeon was represented by only one element at Chota and was absent from the Cherokee midden at Citico (Bogan 1976:76; 1980).

It was apparently not important in the historic Cherokee diet. The passenger pigeon remains in the Dallas faunal sample were concentrated (88.3%) in the floor fill of Structure 3 in North Village; only 11.6% of the remains were found in East Village Midden.

The passerines are represented by two species (crow, cardinal). The crow was considered by the Cherokee as unclean and not accepted as food (Williams 1930:137). The cardinal may have been taken for its feathers (Swanton 1946:252). Small passerines were regularly utilized by Southeastern Indians as winter foods (Speck 1946:13), but these small birds would have provided only a minor winter food supplement.

Avian remains from the Dallas midden, features and structures suggest that birds formed only a minor food supplement compared with the quantity of meat provided by the deer. They do, however, provide an insight into the different use of birds by status groups with the bird remains following a distribution pattern similar to that described for the deer remains. Passenger pigeon and waterfowl remains were restricted to North Village and East Village Midden. The use of birds, like the distribution of meat, was apparently regulated along status lines.

Reptiles

Snake elements probably represent remains of animals intrusive in the site, although possibly some were used as food. The wide diversity of species of locally available turtles were used in all areas of the village. The midden areas of Mound A contained the fewest turtle elements, but the whole assemblage of turtle remains was dominated by box turtle. West, North and East villages had only 28.4% of the MNI while East Village Midden contained 67%. These small turtles could have been collected in fields and adjoining forests. The aquatic turtles could have been taken either incidentally in fish weirs, by hand, with nets in local ponds and sloughs or when females emerged from the water to lay eggs. The turtles were a regular food supplement in the Dallas subsistence and box turtles provided the raw materials for bowls and turtle shell rattles.

Amphibians

Amphibians probably represented only a very minor food supplement. A large aquatic salamander, the hellbender, could have been taken by grabbing, hook and line or by accident in a fish weir. Bullfrogs and other ranids would have been locally available in shallow standing water. Bullfrog remains were recovered from Structure 3 in North Village and from East Village Midden. Toads and spadefoot toads, because of their burrowing habits, were probably intrusive and did not contribute to the food resources. Gilbert (1943:185) observed that the amphibians played an important role in Cherokee medicinal treatments rather than as dietary supplements.

Fishes

The value of fish in the diet of historic Southeastern Indians was less important than that of mammals and birds. Fish were utilized, but no cultural elaboration (e.g. first fish ceremonies) accompanied the taking of fish (Hudson 1976:281-284). They were captured by using fish weirs (stone and basketry), hooks, spears, arrows, poison and nets (Hudson 1976:281-284; Rostlund 1952: Speck 1909:23-25; Swanton 1946:332-344). The Cherokee were reported to have disliked gar, catfish and eels, and have been characterized as being ambivalent toward the use of fish as food (Gilbert 1943:346; Hudson 1976:281). Fish would have been available year round and provided a good protein source and a supply of minerals and vitamins (Rostlund 1952:3-6).

Two scales from the sturgeon, a fish now extirpated from the Little Tennessee River, were identified in the archaeological sample. This fish was probably uncommon in the Little Tennessee River, but was undoubtedly utilized when it was caught. Gar were probably taken by hook or in fish weirs. The longnose gar was identified on the basis of a left dentary fragment, but most of the gar remains consisted of scales and could not be specifically determined. Minnows were probably taken in conjunction with other fish such as suckers in weirs and nets and may have been eaten in spite of their small size.

Suckers could have constituted a seasonal dietary supplement. These fish, especially the redhorses (<u>Moxostoma</u> sp.), ascend the smaller streams in large numbers to spawn during the spring. They are concentrated at this time in shallow water, making them relative easy to capture. They are also at their nutritional peak during the early spawning season. Thus, these fish could have provided a readily available food source, high in protein, vitamins and minerals, during the early spring when many other food resources would have been at a low point. The number of sucker remains was highest in East Village Midden (301) and lowest in West (41) and East Village (2) areas. Redhorses comprised the majority of catostomid remains recovered, with at least two species represented. Five species of redhorse occur in the Little Tennessee River; except for the river redhorse, the other four species are extremely close osteologically and at the present time can be only tentatively identified on the basis of only a few elements. It is for this reason that the catostomid remains are best considered together at the generic or family level.

Catfish may have provided a regular supplement to the diet and could have been taken in weirs, nets or by hook and line. Their remains are found in all areas of the site. Interestingly, flathead catfish remains were found only in East Village Midden while the single element of a madtom occurred in West Village.

The centrarchids would have been locally available in ponds and from pools in the river and tributary streams. They could be taken with hook and line, nets, poison or weirs. All centratchid remains were found in North Village and East Village Midden except for one element in East and West villages and one in Mound A.

Sauger or walleye remains were restricted to East Village Midden. Freshwater drum remains were second only in abundance to those of the channel/blue catfish. Most of the drum remains consisted of isolated pharyngeal teeth. This fish was an important aboriginal food supplement throughout the eastern United States and is consistently represented in archaeological faunal samples (e.g. Bogan 1976:51; Parmalee 1975;145;. Parmalee et al. 1972; Smith 1975:170, 192).

Ctenoid and cycloid fish scales were recovered from all sections of the site, but 69% of them came from Feature 495 in Mound A. A total of 3478 fish scales and fragments were recovered from this feature. This accumulation of fish scales might be interpreted as the residue from one or a few meals of fish eaten by the mound inhabitants.

Fish remains constituted only 12% of the Dallas faunal sample and provided a small, probably seasonal or occasional food supplement. Hudson (1976:281) commented on the under-utilization of fish by the historic interior Southeastern Indians and the lack of cultural elaboration in relation to fishing. This low level of fish resource utilization may be attributed to a conflict of scheduling with other hunting activities, with the possible exception of spring spawning by suckers. Hudson (1976: 281) noted that the idea of decayed fish was revolting to the Cherokee and to dream about it was a nightmare portending evil.

Summary

The meat portion of Dallas subsistence is dominated by the white-tailed deer and the black bear. The major role of the deer in the diet follows the pattern observed throughout the East at both archaeological and ethnohistorical sites. The raccoon, beaver and woodchuck played a supplementary role, while the elk and bison, although large animals, were apparently taken only occasionally. The turkey was the main avian meat contributor and probably followed the deer and bear in dietary importance. Waterfowl, passenger pigeons, turtles and fish would have provided seasonal or occasional supplements to the Dallas diet.

The pattern of Dallas faunal utilization has been examined to observe how the faunal resources were distributed between the six defined areas of the site. One of the archaeological correlates of a chiefdom postulates that observed human skeletal pathologies were related to diet and that high status individuals had access to different food species which were unavailable to the low status individuals. The unequal access to food species is best illustrated by the bird remains. Elements of waterfowl and passenger pigeon were restricted to North Village and East Village Midden areas. This restricted distribution of waterfowl and passenger pigeon seems to suggest that only high status individuals had access to these birds. Turtles, catfish and sucker remains, although occurring across the site, were concentrated in East Village Midden Area. The minnows, flathead catfish and sauger/walleye were restricted to East Village Midden and North villages. The madtom was found in West Village. Occurrence of the flathead catfish and percid remains in only North and East Village Midden areas may be interpreted as additional supportive evidence for the differential access to certain food species. Another indication of dietary variability is a differential distribution of cuts of meat from major food animals, with a higher frequency of preferred portions in high status areas that were virtually absent from low status areas. The unequal distribution of front and hind leg elements of the white-tailed deer supports the second proposition presented in Chapter 1. The front leg occurred in the village area east of Mound A and north of Mound B, immediately adjacent to the plaza area, while the skull, lower legs and hind legs were the dominant body sections present in the West Village on the backside of Mound A. Bear remains followed a similar pattern. The beaver and raccoon, although their remains were not as numerous as the deer or bear, seem to suggest a distribution pattern similar to the deer. Woodchuck elements were found only in the East Village Midden Area. The distribution of these five animals suggests there was in fact a redistribution of meat from medium and large mammals with the higher status group receiving the "choice" cuts and the lower status group receiving fewer of the choice cuts.

Another correlate of a chiefdom is the reservation of certain animals for status individuals for food or as totems or indicators of a special office or position in the chiefdom. These animals might include various species of raptors and mustelids. The restriction of the occurrence of mink, skunk, river otter and raptor remains to North Village (Structure 3) and East Village Midden and their total absence from the rest of the village strongly supports this correlate.

The support of these archaeological correlates of a chiefdom is not as clear or distinct as one would like. However, if Toqua is considered only a secondary center or low level chiefdom, the lack of clarity in the faunal pattern is understandable. The circumscription and competition for resources would not have been as strong here as it was at sites such as Moundville or Etowah which exhibit a very complex chiefdom (Peebles 1978). The patterning of the faunal materials and evidence for differential access to food species, cuts of meat of major food animals, and access to the use of certain symbolic animal skins and body parts at sites such as Moundville should be quite clear and distinctive. The lower level chiefdoms, although probably in conflict with other adjacent chiefdoms over hunting territory, were utilizing less circumscribed resources and the dietary differences between high and low status individuals would not have been as clear cut.

Burial Associations

The burial associations from Toqua are divided into three groups; the Dallas burial associations recovered by J. W. Emmert (Table 6) and the Dallas and Cherokee burial associations recovered in the 1975-1977 excavations (Table 7). Emmert's materials were collected from burials excavated from mounds A and B (Polhemus 1979, Pers. Comm.). The Dallas burial items will be discussed as a single sample.

Table 6: Burial Remains from the J. W. Emmert Excavations.

Burials	Mound A 13	18	33	37	41	43	49	51	52	57	Total	Mound B 3	7	13	Total	Total
Worked beaver incisor							2				2					2
Wolf maxilla							1				1					1
Raccoon baculum							1				1					1
Cougar jaw/canine	1						1				2					2
Bison metatarsal							1				1					1
Indeterminate mammal bone pin	1										1					1
Indeterminate mammal bone projectile point							31				31					31
Antler pin							2				2					2
Total	2						39				41					41
Shell cup													1		1	1
Shell gorget	1						1				2					2
Shell mask	1		1	1			1	1			5					5
Ear pin		1	3		1					1	6					6
Shell disc							1				1					1
Shell beads		189				237	122	3233			3781	480	1749	455	2684	6465
Conch shell													1		1	1
Conch shell fragment									1		1					1
Cockle									1		1					1
Total	2	190	4	1	1	237	125	3234	2	1	3797	480	1751	455	2686	6483
Grand Total	4	190	4	1	1	237	164	3234	2	1	3838	480	1751	455	2686	6524

Table 7: Dallas and Cherokee Burials Associations.

	Cherokee	Dallas														
		W. Village		N. Village		Mound A		Mound B		E. Village Midden						
	Total	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Mammals															
Gray Squirrel										10	4.76	10	2.52	10	2.51
Fox Squirrel		4	6.45									4	1.01	4	1.00
Worked Beaver incisor		1	1.61	2	11.76	2	2.50			2	.95	7	1.76	7	1.76
Wolf tooth/jaw		1	1.61					1	3.70			2	.50	2.	.50
—Bear baculum										1	.47	1	.25	1	.25
Raccoon baculum		1	1.61	2	11.76					2	.95	5	1.26	5	1.25
Longtailed Weasel										2	.95	2	.50	2	.50
Mink						3	3.75			2	.95	5	1.26	5	1.25
Cougar										2	.95	2	.50	2	.50
White-tailed Deer-worked		2	3.22			1	1.25			3	1.42	6	1.51	6	1.51
Antler				3	17.64					3	1.42	6	1.51	6	1.51
Horse tooth	1													1	.25
Indeterminate mammal bone-worked		3	4.83	3	17.64	15	18.75	4	14.81	12	5.71	37	9.34	9	9.31
Indeterminate mammal bone bead		4	6.45			3	3.75			87	41.42	94	23.73	96	23.67
Indeterminate mammal bone		9	14.51	1	5.88	2	2.50					12	3.03	12	3.02
Birds															
Trumpeter Swan				4	23.52							4	1.01	4	1.00
cf. Canada Goose		1	1.61							1	.47	2	.50	2	.50
Turkey tarsometatarsus awl		1	1.61			2	2.50			6	2.85	9	2.27	9	2.26
Sandhill Crane						1	1.25					1	.25	1.	.25
Indeterminate bird bone bead		24	38.70									24	6.06	24	6.04
Indeterminate bird bone-worked				1	5.88							1	.25	1	.25
Indeterminate bird bone						3	3.75			1	.47	4	1.01	4	1.00
Reptiles															
Snapping turtle						1	1.25					1	.25	1	.25
Box turtle-bowl						1	1.25			2	.95	3	.75	3	.75
-rattle		10	16.12			31	38.75	1	3.70	51	24.28	93	23.48	93	23.42
Turtle rattles?(pebbles)						4	5.00	10	37.03	1	.47	15	3.78	15	3.77
Slider/Graptemys										1	.47	1	.25	1	.25
Softshell				1	5.88							1	.25	1	.25
Amphibians															
Bullfrog bead										9	4.28	9	2.27	9	2.26
Frog/Toad bead										7	3.33	7	1.76	7	1.76
Fish															
Walleye jaw		1	1.61									1	.25	1	.25
Drum teeth						11	13.75	11	40.74	4	1.90	26	6.56	26	6.54
Catfish spine										1	.47	1	.25	1	.25
Total	1	62	99.94	17	99.96	80	100.00	27	99.98	210	99.87	396	99.88	397	99.85
Marine Gastropods															
Olivella		104	4.66	1	.13	63	3.09	1	.05	25	.37	194	1.43	194	1.43
Marginella	24	91	4.08			140	6.88	26	1.38	208	3.13	465	3.44	489	3.61
Scotch Bonnet		1	.04									1	.01	1	.01
Busycon															
-cup				2	.27	2	.09					4	.02	4	.02
-pendant		2	.08									2	.01	2	.01
-worked fragment		1	.04	1	.13			5	.26	8	.12	15	.11	15	.11
-beads	2	2007	90.08	671	93.06	1795	88.07	1820	97.11	6386	96.14	12,679	93.89	12,681	93.73
-earpins		6	.26	7	.97	18	.88	5	.26	3	.04	39	.28	39	.28
-masks		1	.04			1	.04			2	.03	4	.02	4	.02
-columella		1	.04									1	.01	1	.01
-gorget		3	.13			13	.63	3	.16	5	.07	24	.17	24	.17
-buttons		2	.08					4	.21			6	.04	6	.04
-disc										4	.06	4	.02	4	.02
Conch pendant		1	.04									1	.01	1	.01
Cockle		1	.04									1	.01	1	.01
Freshwater pearl bead		7	.31	39	5.40	6	.29	10	.53	1	.01	63	.46	63	.46
Total	26	2228	99.92	721	99.96	2038	99.95	1874	99.96	6642	99.07	13,503	99.93	13,529	99.99
Freshwater Aquatic Gastropods															
Io		1	4.34									1	2.94	1	2.94
Campeloma		1	4.34							1	12.50	2	5.88	2	5.88
Leptoxis		3	13.04							3	37.50	6	17.64	6	17.64
Pleurocera		14	60.86	1	100.00	1	50.00			4	50.00	20	58.82	20	58.82
Indeterminate gastropod		4	17.39			1	50.00					5	14.70	5	14.70
Total		23	99.97	1	100.00	2	100.00			8	100.00	34	99.98	34	99.98
Freshwater Naiads															
cf. Amblema plicata		1	1.28									1	.43	1	.43
Fusconaia barnesiana		1	1.28			1	4.54					2	.87	2	.87
Fusconaia subrotunda		5	6.41			1	4.54			2	2.04	8	3.49	8	3.49
Elliptio crassidens		1	1.28									1	.43	1	.43
Elliptio dilatatus		8	10.25	1	5.26	1	4.54			22	22.44	32	13.97	32	13.97
Lexingtonia dolabelloides						1	4.54			1	1.02	2	.87	2	.87
Pleurobema cf. clava				1	5.26							1	.43	1	.43
Anodonta grandis										1	1.02	1	.43	1	.43
Epioblasma cf. capsaeformis		1	1.28									1	.43	1	.43
Lampsilis ovata		14	17.94	5	26.31	7	31.81	5	41.66	36	36.73	67	29.25	67	29.25
Lampsilis ovata (spoon)		7	8.97			1	4.54			3	3.06	11	4.80	11	4.80
Proptera alata		1	1.28	1	5.26							2	.87	2	.87
Villosa cf. vanuxemi				1	5.26							1	.43	1	.43
Ptychobranchus fasciolare										2	2.04	2	.87	2	.87
Ptychobranchus cf. subtentum		4	5.12							9	9.18	13	5.67	13	5.67
Indeterminate bivalve		35	44.87	10	52.63	10	45.45	7	58.33	22	22.44	84	36.68	84	36.68
Total		78	99.96	19	99.98	22	99.96	12	99.99	98	99.97	229	99.92	229	99.92
Total	27	2391		758		2142		1913		6958		14,162		14,189	

Marine shell burial associations constitute the largest class of accoutrements. Although only one fragment of a ribbed marine cockle (Chione cancellata) found with a Toqua site burial was drilled, a group of 80 drilled cockle shells were recovered by Myers (1964:13) with a Mississippian child burial at Citico (40MR7). Beads were made from the Olivella and Marginella shells which coastal groups collected and traded to the people in the interior. Specimens of these two shells had the apex removed and were strung and worn as a necklace. One specimen of the Scotch bonnet (Phalium granilatum) was recovered. These three marine gastropods inhabit the South Atlantic Coast and along the Gulf of Mexico Coast to Texas (Abbott 1974:232, 161). They could have been traded across the mountains from the East or by way of one of the major river systems from the Gulf of Mexico.

The most common marine shell recovered in Late Mississippian sites is a marine conch (Busycon), probably the lightening whelk (B. contrarium), which occurs from New Jersey to Florida and along the Gulf states (Abbott 1974:222). The conch was the source material for a variety of items: cups, dippers, masks, gorgets, "buttons", discs, earpins and beads. The distribution, modification and use of these shell items have been documented throughout the eastern United States during the Mississippian Period (Baker 1923; 1932; 1941; Duffield 1964; Philips and Brown 1978; Parmalee 1958; van der Schalie and Parmalee 1960). Five large conchs found with Toqua burials had the columella and the inner whorls removed and were fashioned into large cups or dippers (e.g. Gilliland 1975:169-171). Hudson (1976:229) suggests that dippers were used for the Black Drink ceremony, a ceremony employing a drink made from the leaves of holly.

Shell masks, often inscribed with two eyes and a stylized nose, were fashioned from the body whorl of large conchs (Lewis and Kneberg 1946: 130, 147). The whorls of the conch were also modified into various sized and shaped gorgets, "buttons" and discs. The gorgets range from plain to variously engraved and cut out patterns. Lawson observed:

> They often times make of this shell, a sort of gorge which they wear about their neck in a string; so it hangs on their collar, where on sometimes is engraven a cross, or some odd figure, which comes next to their fancy (Lawson 1860:315-317).

The distribution and style of the gorgets from east Tennessee have been discussed by Kneberg (1959), Lewis and Kneberg (1946:115, 130), MacCurdy (1913) and Lewis (1945; 1946a,b). The gorgets recovered from Toqua included 7 Lick Creek Rattlesnake gorgets, 10 small rattlesnake motifs, 2 spider gorgets with a scalloped triscal margin, 3 plain gorgets and 6 small engraved shell square "buttons."

The columella of the conch was removed and either suspended as a pendant, cut into sections and drilled for beads or shaped into earpins. Le Page Du Pratz (1774:364) observed that among the Natchez:

> The women's ear rings are made of the center part of a large shell, called burgo, which is about the thickness of one's little finger, and there is a hole in the ear about that size for holding it.

Swanton cited Dumont de Montigny's account of the manufacture of earrings and gorgets:

> There are besides, on the shores of the sea, beautiful shells of a spiral shape called "burgau". . . It is of these burgau that the Indian women make their earrings. For this purpose they rub the ends of them for a long time on hard stones and thus give them the shape of nails with heads, in order that, when they insert them in their ears, they will be stopped by this kind of obstruction. . . . The savages also wear on their necks plates 3 or 4 inches in diameter made of pieces of this shell, to which they give a round or oval shape by grinding them on stones in the

> same manner. They then pierce them near the edge by means of fire and use them as ornaments (Swanton 1946:486).

Adair (Williams 1930:179) also commented that beads were made from conch shells by rubbing the shell on hard stones. The 39 earpins recovered from Toqua range in length from 43 to 177.5 mm, while the head diameter ranges from 16.7 to 29.6 mm. Many of the pins are broken and eroded. The heads of the pins often retain the natural grooves of the columella, while the shaft of the pin is typically ground smooth. The conch columella was also used in the manufacture of shell beads (round and tubular), as was the whorl of the conch (disc beads). Marine shell beads dominate the Toqua burial accoutrements (19,144) and accounted for 92.5% of the assemblage.

The early accounts of Spanish expeditions into the southeastern United States made note of the large quantities of pearls worn by the Indians and used as decorations (Bourne 1904:65, 99; Varner and Varner 1951:302). It is possible that the large number of pearls DeSoto and his chroniclers described were nothing more than highly polished conch shell beads (Lewis and Kneberg 1946:130; 1958:112; Swanton 1946:481, 482). However, not all of the beads at Toqua were made from marine shell; 63 were drilled freshwater pearls.

The marine shell beads were of three basic shapes: disc, round and tubular. The round and tubular beads were manufactured from the conch columella, with many of the large tubular beads still exhibiting the columellar groove. The largest of the tubular beads was over 50 mm long and the widest about 40 mm in diameter. The small tubualr beads were only 3 or 4 mm wide and only about 10 mm long. However, three beads did not fit into this tripartate scheme: a triangular, waisted bead; a three-hole bead; and one tubular bead, incised to appear as four beads.

Beads were typically recovered from around the wrists, ankles and neck. The small round, medium-sized disc beads were usually placed around the neck.

Fifteen worked fragments of conch shell were recovered from burial associations, but no unworked, unmodified shells or shell pieces were encountered at the site. The lack of the unmodified shell, debitage and discards strongly suggests that the conch shell was cut into beads, cups and gorgets elsewhere and traded to the Toqua inhabitants as a finished product, or at least as blanks or preforms. Sabol (1978:26) suggested Dallas shell exchange was controlled by the Dallas inhabitants of the Citico Site (40HA65) which may account for the lack of conch shell debitage across the site or in association with burials. Polhemus (1980, Pers. Comm.) suggests that the burned and broken conch whorl and columella fragments in the northwest corner of Structure 14 (Mound A) represent a shell working location. This would indicate marine shell work was probably done only in high status dwellings. However, these burned conch fragments are the only marginal evidence for shell working at the site. There is no shell debitage as expected there would be if marine conchs were being modified into artifacts at Toqua.

Unmodified freshwater gastropods and bivalves often accompanied burials. The unmodified bivalves were usually placed at the feet and may have represented food offerings. The pocketbook (*Lampsilis ovata*) was the most common freshwater mussel found associated with burials and was often placed in accompanying vessels. The valves were occasionally modified into spoons; the hinge teeth were ground off and the anterior ventral margin ground and cut to form a handle. Seventy-five valves of the pocketbook were found as burial associations, eleven left valves were modified into spoons and 64 valves were unmodified (23 right and 41 left). Shells of the pocketbook that had been obviously modified into "spoons" are all left valves, while ca. 64% of the unmodified valves were also left valves. Thruston (1973:311-313) observed a similar pattern in shell spoons:

> The vessels of shell and pottery discovered in the graves were probably originally supplied with food, placed there to be used upon the journey into the next world, as nearly all of them were supplied with spoons. The food has disappeared by absorption and decay, but the spoons are generally preserved. They are found in the vessels, and sometimes within the very bones of the hands. . . .It will be observed, from the side of the bivalve selected, that the spoons were made for use in the _right hand_, showing that the mound builder, like his white successor,was "right-handed". In our explorations we have not observed a spoon made for the use in the left hand; but we are informed by Mr. Holmes that there are two specimens of this form in the National Museum (from Tennessee and Kentucky).

Two other freshwater bivalves, _Proptera alata_ (pink heel-splitter) and _Anodonta grandis_ (floater), that were found as burial associations may also have served as shell spoons. Two left valves of the pink heel-splitter and one large right valve of the floater were recovered. The floater, a quiet water-mud bottom inhabiting animal was probably very rare in the Little Tennessee River in pre-contact times.

The vertebrate remains associated with the burials are presented under nine different headings indicative of their role at the time of interment. Two burials contained the bones of squirrels that might be interpreted as the remains of food offerings. One burial contained the skulls and forelimb elements of two gray squirrels, while another contained four limb elements of two fox squirrels.

Worked bone or bone tools is by far the largest category of vertebrate burial associations. Nine beaver incisors were recovered, several of which showed evidence of alteration on the occlusal surface. These teeth may have been used in wood(?) working. Two types of "awls" were represented: the deer ulna awl (6) with a smooth flattened distal end, and the turkey tarsometatarsus awl (9) with the typical sharpened distal end. One section of bear baculum was encountered as well as six raccoon bacula. Four of the raccoon bacula were polished and two were drilled through the proximal end. One recovered raccoon baculum fragment had been drilled through the proximal end and was decorated with five sets of three incised lines. Considering ethnographic accounts (Speck 1928:347), bear and raccoon bacula found with burials at Toqua may represent hunting amulets.

Six cylindrical smooth antler pins of unknown function and two deer antler tines occurred in the assemblage. Two distal cougar radii (right, left) had the proximal end of the shaft ground off at an angle that resulted in a beveled edge. One of the radii exhibited butchering marks on the anterior and posterior margins, cuts probably inflicted when the radius was disarticulated from the carpals and foot. The "indeterminate mammal bone" is the largest category of worked bone pieces. It included 31 "projectile points," 7 bone pins, 4 bipointed fragments, 4 socketed points and 22 worked fragments. One worked fragment of bird bone was encountered. The bone pins include one spatulate pin with a flattened, expanded head and long shaft (total length 164 mm) and two other pins about 250 mm long. The socketed "spear" points are made from the diaphysis of a large mammal long bone with both ends removed and one end ground at an acute angle (beveled). Polhemus (1977:168) considers these to be male status items.

Beads were manufactured from mammal, bird and amphibian elements. The majority were fashioned from small mammal long bones, but the most interesting beads were those made from amphibian elements. Eight beads were manufactured from the tibiofibula and one from the humerus (?) of the bullfrog. The tibiofibulae were cut in half and the two resulting beads each had a bifurcate end (natural structure of this element) and the opposite end a single opening. The other seven amphibian bone beads appear to be unique as burial associations in the interior southeastern United States.

A separate class of associations may be constructed to cover items that may be inferred as amulets or charms. For example, two burials contained four and five indeterminate mammal caudal vertebrae, respectively. Also included in this category of amulets are the cougar jaw and possible cougar canine and a maxilla, left jaw and carnasial of a wolf. The right wolf carnasial had holes drilled through each root. This wolf tooth was associated with an infant burial. Speck (1928:346) illustrates a Pamunkey dog tooth (incisor) charm worn by teething children, this providing a possible analogy for the occurrence of a wolf tooth in an infant grave. The wolf maxilla may have been included in a skin robe or retained as a trophy.

Animal skin pouches or personal bundles also appear to have been burial accoutrements as evidenced by the occurrence of mustelid remains with four burials. Two weasel skull fragments and two left jaws, representing two individuals, were recovered with one burial. One mink skull and metapodials were recovered, along with a sandhill crane skull, from a vessel associated with a burial. A skull and jaw of a mink were found with two other burials. One of the skulls had been cut off at the basi-occipital; the metapodials, jaws and anterior portion of the skull would have been left in a skin bundle if the skin was to retain some of its original shape or form (Ubelaker and Wedel 1975:449, fig. 6). Mustelid skins were used throughout the Southeast for personal bundles; weasel skins were used as a headdress ornament and Virginia priests ornamented their ears with weasel skins (Swanton 1946:251, 441). The rarity of mustelid remains other than these three mink and two weasel "skins" and their inclusion with status burials in Mound A and the East Village Midden Area attests to a honored or sacred role of mustelids among the Dallas occupants of Toqua.

The sandhill crane skull, quadrates and mandible associated with the mink skull and metapodials are the only remains of this large bird found associated with a Dallas burial at Toqua. Parmalee (1967:157) reported the skull of a whooping crane recovered from the hip area of a Oneota burial from Alamakee County, Iowa. Today the sandhill crane is an occasional migrant in east Tennessee. The head of this Toqua bird may have been taken because the bird was considered unusual or symbolic, possibly because of its rarity and/or plumage.

The ethnographic and ethnohistoric literature is replete with references to the use of feather fans, especially those fashioned from the wings of eagles and swans. One burial in the North Village contained the carpometacarpus and digits of a trumpter swan. This portion of the wing would have contained the large primary flight feathers and may have served as a fan or a symbol of office. Two left carpometacarpals of Canada geese were also found with burials. One carpometacarpus had a butchering cut across the distal end and the other element was cut medially. These two elements, supporting the primary flight feathers, were probably used as fans.

A large isolated walleye dentary was found in association with a burial in the West Village. The dentary compared closely to a University of Tennessee, Knoxville, Department of Anthropology, Zooarchaeological Reference skeleton which weighed about nine pounds and was about 730 mm long. This item may have been a trophy item, in light of the large size of this fish.

Turtle shells occurred as burial accoutrements and represented several different functions. One large snapping turtle carapace was used as a basin or container; at least six box turtle rattles had been placed inside this shell. One complete apparently unmodified slider/map turtle carapace was also recovered.

The box turtle shell was the most common turtle shell associated with burials. At least 3 bowls and 93 rattles were represented. Bowls typically had the centrum and transverse processes of the vertebrae removed. Speck (1928:388) illustrates a terrapin carapace used as a dish for serving turtle stew. The evidence for box turtle rattles or at least small rattles was of two kinds. The best archaeological evidence is in the form of box turtle carapace and plastron elements, some of which were drilled and contained associated quartz pebbles and/or drum teeth. The other evidence suggesting the former occurrence of rattles are concentrations of quartz pebbles and drum teeth, used in the box turtle rattles, the shell had probably rotted. Most of the box turtle rattles were fashioned from the unfused carapace of young individuals. The number of rattles present was based on the most common element represented, usually either the hyoplastron or the hypoplastron. These shells were drilled so they could be strung and tied by a thong to the lower legs. The plastron was typically drilled through the hypoplastron (49 drilled) from the outside and usually at the midline of the plastron; only 4 hyoplastrons and 1 entoplastron were drilled. The corresponding holes in the carapace were recorded for the neurals (2) and pleurals (22). Eight of the holes drilled in the pleurals were near the dorsal end of the pleurals. The plastron was tied to the carapace by a thong running through a hole in the plastron and a hole in the top of the carapace. Lewis and Kneberg(1946:126, 127, 148, pl. 103) reported box turtle rattles from Dallas sites and observed that they usually occurred singly on the forearem and upper arm; in one instance a bundle of 10 shells were found at the lower back of a woman. Their illustration only shows one hole in the plastron and as many as four holes in the carapace of box turtle rattles (Lewis and Kneberg 1946:126). The archaeological evidence reported by Lewis and Kneberg (1946:127) and the ethnographic reports (Speck 1909:61-62; Hudson 1976:373) document the use of small white pebbles (quartz) and the pharyngeal teeth of freshwater drum for the pebbles in the rattles. Adair (Williams 1930:101, 116, 178) noted that women wore turtle shell rattles attached to a piece of deer skin on the outside of the lower leg. This was also done by the Overhill Cherokee (Bogan 1976:115). Swanton (1946:622) mentions the use of box turtle rattles only by Creek women. Speck (1909:61-62, pl. 7) observed the women's use of bundles of 6 to 10 box turtle rattles filled with white pebbles bound to the lower leg. Interestingly, these rattles were perforated with numerous holes (Speck 1909:pl. 7).

The distribution of burial associations as well as burial location have been widely used in determining the status position in ranked societies (Hatch 1974; 1976; Hatch and Willey 1974; Peebles 1974). High status males were buried in mounds while women and children constituted the majority of the village burials (low status). Females and subadults in the burial population, discussed by Hatch and Willey (1974:109), tended to be buried with shell artifacts of local and marine origin including shell beads, certain gorget types and earpins. The location of burials in the mound or in special areas of the village were apparently reserved for status individuals. They were accompanied by burial items denoting wealth and office. Thus, the higher the status of the individual during life, the more evidence of labor intensive items offered or required for that individual's proper burial. The higher status burials contain the symbols of office, i.e. labor intensive items such as shell gorgets, cups and shell masks. The lower status burials would include locally manufactured goods and utilitarian items (e.g. shell spoons, bone beads, bone tools) (Hatch 1976:141, 152).

The animal burial associations will be briefly discussed in relation to the five different village areas (Table 7, pp. 58). The Busycon shell masks, cups, gorgets and earpins are concentrated in the village area. Two marine shell cups found in the North Village Area may signify a special function area. Two Mound A burials were accompanied by mink skulls that probably had been parts of prepared skins or pouches. All small mustelid remains recovered from the general excavations were limited to burial associations, while the larger mustelid remains, those of river otter, were recovered from floor fill in Structure 3 (Table 2, pp. 33). The paucity of mustelids in the faunal sample suggests that these animals may have had a special cultural role and their use was restricted for this function. The distribution of Olivella and Marginella beads was compared by village area using the chi square test and found to be highly significant (Table 8). The sample from North Village was excluded because no Marginella beads were recovered from this area. Olivella beads were more common in West Village than expected, while they were less abundant than expected in East Village Midden. The opposite is true for the Marginella bead distribution.

Hatch (1976:141, 152) observed that low status village area burials were accompanied by bone beads and utilitarian items. This seems to have been the case for the burials from West Village and for some burials from East Village Midden Area. The occurrence of mink and weasel "skins" suggest at least some high status or prominent individuals were buried in the East Village Midden Area. The only other mustelid burial association was in Mound A.

The patterns observed in the distribution of the burial associations are being analyzed by Gary Scott, Department of Anthropology, University of Tennessee, Knoxville. He is combining the animal material burial associations, all the other burial accoutrements and the physical anthropological data in a multivariate analysis to determine burial status at Toqua (Scott 1979, Pers. Comm.).

Bone Artifacts from Excavations

The bone artifacts recovered during excavation of the Dallas occupation areas at Toqua are discussed by village area. Those items from unknown, surface or plowzone context are discussed first, followed by an examination of artifacts from known contexts. These items are

Table 8: Comparison of Olivella and Marginella Shell Beads by Village Area.

	West Village			Mound A			Mound B			East Village Midden			
	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	Total
Olivella	104	57.19	38.313	63	59.64	.201	1	7.91	6.036	25	68.34	27.485	193
Marginella	91	137.80	15.894	140	143.45	.082	26	14.08	2.509	208	164.65	11.413	465
Total	195			203			27			233			658

df=3 $X^2=101.933$ $p<.001$

grouped by class of raw material (mammal, bird, reptile). After these materials are discussed, the assemblage as a whole will be examined for any recognizable pattern in artifact distribution.

West Village Area

There were 12 bone artifacts recovered from West Village Area. One beam of shed antler had three of the tines removed. Three antler tines showed evidence of working; one tine was cut off proximally and had a beveled tip, another had the tip removed using the groove and snap technique, and the third fragment appeared to have undergone some modification. Five indeterminate animal bones were modified: two fragments were worn, two appeared to be splinter awl fragments and one splinter (95 mm long) had an end ground to a point. The most interesting artifact was a complete "spear point." This artifact had been constructed from the long bone of a large mammal (femur?). One end was squarely cut off and had a hole drilled in the shaft close to the end. The opposite end was ground off producing a long beveled edge. Two proximal turkey tarsometatarsals were modified into awls.

North Village Area

The bone artifacts from the North Village Area were primarily from Structure 3. Two indeterminate worked mammal bone fragments were recovered from the plowzone of this section. The assemblage is dominated by 110 pieces of antler, primarily tines (103) that were either cut off, removed by groove and snap, sharpened to a point or ground. The remaining seven fragments were cut or incised beam or tine shaft fragments. Four beaver incisors were worked, three of which were lower incisors. Two bear fibulae were modified, one of which had an end ground to a point. One bear baculum was recovered which had lines incised around it. The only modified deer bone was a right metatarsal which had been longitudinally grooved dorsally and ventrally in preparation for splitting. The indeterminate mammal bone artifacts may be divided into five categories. Nineteen fragments were worked, ground or polished, but did not fit a particular category. One indeterminate mammal ulna had been modified into an awl. The shafts of small mammal bones had been used for the manufacture of 13 small bone beads. One bipointed artifact was recovered. Seven bone splinters ranging from 47 to 135 mm in length had one end ground to a point and the other end broken off.

An eight-toothed bone comb, bone pins and fragments of the expanded end of pins provide examples of bone working craftsmanship. Five serrated fragments representing three bone pins were recovered. One pin fragment had a diamond-shaped, serrated edge and expanded head as opposed to the more common round bone pin head. Turkey bone artifacts consisted of four tarsometatarsal awls, one spur cut off during the manufacture of the tarsometatarsal awl and a distal radius which was removed from the shaft by the groove and snap technique. Twenty-one indeterminate bird bone pieces had been modified. Three were ground to a point, 1 was a bead and 16 were worked, cut or ground fragments. Another flat piece of bird bone had an elongate hole cut in one end and was smoothed and tapered to a rounded point. This artifact, 57 mm long and 13 mm wide, may have been used in weaving or basketry work. Three unique turtle element artifacts were recovered in this area. The posterior portion of a box turtle plastron had the inside ground down.

An "awl" had been manufactured from a softshell turtle coracoid and an indeterminate turtle long bone was modified. One fragment of an indeterminate turtle carapace was drilled and a softshell turtle pleural was cut and ground.

Mound A

Eleven modified pieces of animal bone were recovered from Mound A. These included a bear baculum shaped and sharpened into an awl and one fragment of a deer metatarsal that had been split and smoothed. The largest category of bone artifacts consisted of worked fragments of of indeterminate mammal bone. Five of these which have been designated as "splinter awls" are fragments with one end ground and smoothed. One 170 mm-long fragment was worked into a slender pin. Another bone "spear point," 202 mm long and 24 mm in diameter, with a hole in the socketed end was recovered. A tarsometatarsus shaft section that compared favorably with the sandhill crane had been smoothed.

East Village Area

The general collections from the East Village included a worked fragment each of indeterminate mammal and bird bone. Two modified antler tines were recovered. One was the end of a tine which had been removed using the groove and snap technique, the other a 52 mm long socketed antler point.

East Village Midden

The bone artifacts from East Village Midden will be discussed by their location in structure, feature and midden. This will allow for a discussion of the distribution of different artifact classes.

The bone artifacts collected from the surface and plowzone included three antler tines, one antler beam fragment split lengthwise, eight worked fragments of indeterminate bone, eight elongate splinters with a worked or ground end, one bone pin fragment and a polished raccoon baculum.

Structures

Eighteen artifacts were recovered from the floor areas of the structures in the East Village Midden Area. A raccoon baculum was recovered which had the proximal end removed, 3 lines incised around the midshaft and was polished. A lower left beaver incisor had been cut off and the occusual surface ground. The proximal end of the left deer metatarsal was incised, suggesting a possible metatarsal awl fragment. A proximal left bear radius had the shaft ground off at an angle; possibly it was modified for use as a gouge. Four worked antler tines were encountered, two of which had been cut off and two sharpened down to a point. Two indeterminate mammal bone beads were found. Three indeterminate mammal and one indeterminate bird bone fragment had one end sharpened. Two mammal bone fragments had both ends removed, one having been modified into a "pin." Two other mammal bone fragments showed evidence of wear or grinding.

Features

Feature 534 in Structure 39 contained 215 fragments of antler, representing probably 10 different large antler pieces. Two other antler tines were recovered. One tine (54 mm long) was sharpened to a point and socketed, the other had the tip removed by the groove and snap technique. A deer skull fragment had both antlers chopped off just above the pedicle, illustrating a technique used for antler removal. Three fragments of beaver incisors showed evidence of grinding, one having had the proximal end removed. The right ulna of a bobcat had the distal end broken off and ground to a point. One proximal left deer ulna was modified into some form of perforating tool. One indeterminate mammal bone splinter (60 mm long) had one ground end, a second fragment showed evidence of modification, and a third was made into a bone bead (18 mm long). A bone pin fragment was recovered that illustrates the art of bone technology. This was the proximal end of a pin with an expanded, flat head (18.2 mm in diameter, 2 mm thick). The edge had been cut by notching (18 notches) and the center was perforated by a small hole. The head tapers into a short broken shaft 3 mm in diameter.

Two turkey tarsometatarsals had the distal ends removed and the broken shaft modified into awls. A tarsometatarsus from a male turkey had been scored around the distal end to remove the trochlea, probably in preparation for manufacture of an awl. Another indeterminate bird tarsometatarsus was made into an awl.

The only evidence of a box turtle rattle was a piece of the anterior plastron that had been drilled along the midline.

Midden

Six bone artifacts were recovered from the plowzone in East Village Midden Area. Four of these were indeterminate mammal bones, one a possible beamer fragment. A piece of a right bear ulna had the shaft broken and modified into an "awl." The other artifact was a smoothed antler tine.

The bone artifacts recovered from the midden were manufactured from the remains of deer, bear raccoon, dog, beaver and turkey. Thirteen fragments of antler exhibited modification, 10 of which were tines that had been cut off. Two tines were sharpened and one had the distal end beveled. One antler beam fragment was drilled and another appeared to have been part of a pin.

Both the bear and raccoon were represented by single worked and polished fragments of bacula. A possible dog metapodial was converted into a perforating tool by breaking off the proximal end and grinding the shaft to a point. Two lower beaver incisors were worked. Six deer elements were modified: three were proximal ulnae which had the shaft ground down to a flattened point; a proximal radius and a metatarsal fragment appeared to have been worked; and the gonial angle of a left jaw had been cut off and ground.

The largest category of bone tools included those manufactured from indeterminate mammal bones. These bone fragments were from large mammals, probably the white-tailed deer and bear. Fourteen fragments of bone exhibited evidence of wear, polish or grinding. Three bone splinters had one end ground or smoothed to a point and ranged in length from 43 to 151 mm with an average length of 83 mm and a diameter between 6 and 10 mm.

Two long indeterminate mammal bones were ground on both ends (117 and 161 mm long). These bipointed objects have been considered as projectile points and hair pins (Polhemus 1980, Pers. Comm.). One thin worked splinter of bone may have been a scarifier. Hudson (1976:475, fig. 98) discussed the Cherokee use of a kind of comb made from sharp splinters of turkey bone in ritual scratching and the artifact resembles one of the "teeth" in the illustrated scratcher. Two large bone "spear points" were cut from the shaft of a large mammal long bone (femur?);

both were broken and fragmented (see Polhemus 1977). These highly modified bone artifacts have a long tapering bevel at one end while the other end of the shaft is complete. One of these artifacts has a hole drilled in the wall of the shaft at the unmodified end.

Artifacts manufactured from avian elements included six pieces of turkey bone and four from indeterminate bird species. Three of the turkey bone fragments are from a tarsometatarsal awl and one, a spur cut from a tarsometatarsus; probably the spur was removed and discarded during the manufacture of an awl. The other two turkey elements are tibiotarsi; one had the distal end removed, the other was grooved along the length of the shaft. Three of the indeterminate bird bones were sharpened to a point at one end.

Summary

The raw materials for the manufacture of bone tools and artifacts were obtained from primarily the deer, bear and turkey. Antler, probably deer, was widely used for projectile points and as flakers for the manufacture of stone tools. The deer elements used included the proximal ulna for awls and the metatarsal for beamers. The bear radius and fibula were manufactured into gouges and awls and the baculum was modified into awls and possibly amulets. The most common turkey element used was the tarsometatarsus, which was modified into awls. At least two turkey tarsometatarsi of males as evidenced by the cut off and discarded spurs, were made into awls. The only evidence for the use of the box turtle shell as a rattle other than those found with burials was in the form of a single drilled plastron fragment. Artifacts from softshell turtle elements consisted of a cut and polished pleural and an awl manufactured from a coracoid. Indeterminate mammal and bird bones, probably those of deer and turkey, constituted the largest class of bone artifacts, with the exception of antler. Many of these indeterminate worked pieces exhibited some wear or grinding, the most common being a elongated splinter of bone with one end ground or smoothed to a point.

Bone artifacts were concentrated in North Village and East Village Midden Area, while the West and East Village areas had the fewest. The turkey tarsometatarsal awls occurred in West, North and East Village Midden areas. The socketed bone "spear" points were found in West Village, Mound A and East Village Midden. Worked beaver incisors were restricted to North Village and the East Village Midden areas. The polished and incised raccoon and bear bacula were found only in the North and East Village Midden areas. Worked antler tines and fragments were found throughout the village area. The greatest concentration of bone tools occurred in the North Village and East Village Midden areas. This may have been a result of preservation and smaller samples from East and West villages or a result of the concentration of domestic activity in East Village Midden and to a lesser extent in Structure 3. The lack of bone tools from the mound suggest fewer utilitarian activities on the mound summit.

Butchering Patterns

Marks which can be interpreted as butchering or skinning cuts were observed on 120 pieces of bone in the Dallas faunal sample. Bones exhibiting cut marks were concentrated in East Village Midden Area (99 elements). North Village Area was second with 12 cut bones, followed by West Village with 8 and Mound A with only 2 cut elements. Marks were found on elements of nine species of animals: deer, cf. dog, cougar, bear, bobcat, turkey, bobwhite, softshell turtle and box turtle.

The 104 cut white-tailed deer elements represent only 3% of all white-tailed deer bones recovered in the Dallas faunal sample. Individual elements with cut marks comprised from less than 1% to 24% (the astragali) of the total. Several marks appear on the ramus of a lower jaw and were made either during the removal of the lower jaw or the muscle mass from the jaw. One frontal had the antlers cut off. Two axis were chopped, but none of the atlas examined were cut. The head was detached from the body by severing the neck between the axis and atlas vertebrae. One thoracic vertebra was chopped dorsally. Three ribs were cut laterally and another was chopped off below the head. Apparently the ribs were removed from the vertebral column and the meat cut from them later. The foreleg could be removed from the carcass by cutting the muscles attaching it to the rib cage. Six scapulae were cut on the neck. These cuts would probably have been inflicted while removing the scapula from the humerus. Five cut distal humeri, one cut on a proximal radius and four cut proximal ulna, one which was in the semilunar notch, resulted when the elbow joint was severed. The lower leg was detached from the rest of the leg by separating the carpals from the distal radius and ulna. Two distal radii and one carpal were cut. Twelve proximal metacarpals were also scored in attempts to remove the lower leg. One distal metacarpal was cut anteriorly and two first phalanges were cut ventrally. These cuts, based on their position where the skin lies very close to the bone were inflicted during the skinning process. The lower leg with the carpals, metacarpals and phalanges does not have much meat; the metacarpal was probably broken to extract the marrow.

Evidence for meat removal from the pelvis is indicated by cuts along four ilia. Two proximal femora were cut in removing the hind leg from the carcass. Removal of meat from the femur is suggested by a cut mark on a shaft section. The femur and tibia were separated as evidenced by a cut mark on the lateral side of a distal femur and a cut on a proximal tibia. The removal of the lower hind leg was much more difficult than the process of separating any of the other joints. Five distal tibia were scored, 8 calcanea were cut dorsally and laterally and 27 astragali were cut medially and anteriorly. The difficulties in disarticulating this joint are due to the close articulation of the elements and the number of connecting ligaments which must be severed. The metatarsal was separated from the tarsal complex, probably for marrow extraction. This is supported by cut marks of skinning marks on nine proximal metatarsals. The shaft of one metatarsal bore a skinning mark.

The bear was the second most important mammal in the Dallas diet, but only five elements had butchering cuts. These cuts were located on two distal humeri, a distal tibia and two distal radii. The position of these cut marks suggest total disarticulation of the fore and hind limbs of the bear at the elbow, wrist and ankle. This partition would provide manageable meat packages.

The practice of partitioning the animal carcass at the joints would have been the most expedient. This was apparently the practice for butchering mammals larger than a dog or bobcat. The butchering patterns described for the deer and bear point to a sectioning of the limbs into units corresponding to the individual elements and then breaking the bones for marrow (Tables 4, 5, pp.40, 41). The distribution of cut elements by village area roughly correspond to the distribution of percent of total deer bones by village area. The 85 cuts recorded on deer bones in East Village Midden are on elements found throughout the body, but most were concentrated around the ankle joint. The position of cut marks on deer bones from West Village were observed on the proximal metatarsal, proximal metacarpal, astragalus, distal tibia, rib, jaw and distal radius. These elements would correspond to the less meaty portions of the skeleton and do not include the "preferred" front leg. Scored marks on deer bones were recorded from North Village; one cervical vertebra, neck of scapula, proximal tibia, distal tibia, four astragali and one proximal metacarpal. The North Village cut elements represent all parts of the deer skeleton.

Cut marks were observed on elements of three other mammals. One left canid jaw was cut laterally along the horizontal ramus. A cougar right femur was cut on the distal end and a bobcat humerus was cut distally. The two cats seem to have been partitioned in the same manner as the bear.

The only evidence of butchering of birds was a cut bobwhite distal tibiotarsus and two cut distal turkey tibiotarsals and two tarsometarsals, one cut proximally and one cut on the shaft. The position of the marks point to the removal of the lower leg and feet of these birds, probably prior to cooking.

Three turtle fragments bore cut marks. One softshell turtle plastron fragment and one box turtle pleural had been cut. The carapace of a box turtle had been chopped or smashed as evidenced by the ragged edge along its midline. The fragmented and broken box turtle carapace fragments suggest that the large number of box turtles consumed were probably butchered by simply breaking open or crushing the carapace and extracting the animal. This method of removing the animal from its shell could account for the large number of box turtle and indeterminate turtle shell fragments and the large number of relatively complete plastron pieces.

Attritional Processes

Different approaches have been applied to unraveling the factors involved in the formation of an archaeological site (Yellen 1977; Binford 1978a, b; Binford and Bertram 1977). Schiffer (1972, 1976) has proposed "N" (natural) and "C" (cultural) transforms to explain the formation of the archaeological record. Wildesen (1973) has approached the factors involved in the formation of an archaeological site and their quantification by using a model adopted from soil genesis. One of the factors in site formation is the attritional processes affecting the accumulation of the faunal remains (e.g. Binford and Bertram 1977).

One component of the archaeological record is the animal refuse, the bones and shells of animals utilized by the occupants of the site. Lyon (1970) has argued that dogs played a major role in the destruction of animal bones before they become a part of the archaeological record. This biases the picture of the diet of the site's occupants by removing some of the animal remains from the record. Casteel (1971) countered Lyons argument by pointing out that most of the digested bone is still identifiable. Binford and Bertram (1977) used two faunal samples to examine bone frequency and the problems of attrition. All of these authors have discussed the role of dogs in the formation of the archaeological record, but none have been able to clearly and carefully operationalize a methodology which can demonstrate the actual role of dogs and rodents in modifying the archaeological faunal sample.

The Dallas faunal sample from Toqua has been examined in the light of these various arguments on attrition. Dog-chewed and rodent-chewed bones were recorded and the relative frequencies of chewed elements were calculated for the white-tailed deer and compared with all of the deer elements from the site (Table 9). East Village Area had a relatively small faunal sample and a corresponding low frequency of chewed deer bone. The low number of dog-chewed bones from Mound A might be expected if the summit of the mound was one of a high status occupation or an important ceremonial/religious area where dogs were excluded. West Village and North Village also have low values compared with the East Village Midden Area. East Village Midden was the area of deepest midden accumulation and contained 77.9% of the chewed deer bones (Table 9).

The percentage of each anatomical unit of the white-tailed deer which was dog-chewed or digested ranged from 1.75% to 66% of the total number for a particular element. The most chewed elements, both in terms of the percent of total bones and the percent of dog-chewed bones, were the proximal and distal humerii, distal femur and calcaneum (Table 9). Representative elements of nearly the entire deer skeleton showed some evidence of dog-chewing. The dog would be expected to attack those bones and areas of a bone that have soft cancellous tissue or still contain some meat or cartilage. Most areas with cancellous bone such as the proximal humerus were chewed, and the "elbow joint" (distal humerus, proximal radius and ulna) and the "ankle" joint (distal tibia, astragalus, calcaneum tarsals and proximal metatarsal) accounted for 29.48 and 28.18% of the dog-chewed bone, respectively. These two joints would have contained the most cartilage, tendons and small amounts of meat. Dog-chewed elements of the lower leg (distal metacarpal, metatarsal,

Table 9: Chewed/digested Deer Bones from the Dallas Faunal Sample.

Element	Chewed/Digested WV	NV	Md A	EVM	EV	Total	%	Total elements from site	% chewed %
Skull fragment				2		2	.51	111	1.80
Jaw				3		3	.76	68	4.41
Jaw fragment		/1				1	.25	57	1.75
Hyoid								7	-
Teeth								513	-
Atlas				1		1	.25	8	12.50
Axis				5		5	1.28	18	27.77
Cervical	2			2		4	1.02	21	19.04
Thorasic				1		1	.25	22	4.54
Lumbar				5		5	1.28	49	10.20
Sacrum								4	-
Ribs								40	-
Sternabra								6	-
Scapula		1		15	1	17	4.35	113	15.04
Proximal humerus				6		6	1.53	9	66.66
Humerus shaft			1			1	.25	2	50.00
Distal humerus	4	8	2	64		78	20.00	151	51.65
Ulna	1			25		26	6.66	89	29.21
Distal ulna	1					1	.25	5	20.00
Proximal radius				11		11	2.82	104	10.57
Radius shaft		2		2		4	1.02	7	57.14
Distal radius	1			3	1	5	1.28	63	7.93
Carpals	1/1	3/2				7	1.79	87	8.04
Proximal metacarpal				21		21	5.38	103	20.38
Metacarpal shaft	1					1	.25	3	33.33
Distal metacarpal	1	1		2		4	1.02	27	14.81
Pelvis		4		6		10	2.56	43	23.25
Ilium		1		7		8	2.05	30	26.66
Pubis								12	-
Ischium		1		1		2	.51	9	22.22
Acetabulum								8	-
Proximal femur		2		2		4	1.02	16	25.00
Femur shaft		1				1	.25	5	20.00
Distal femur	1	1		3		5	1.28	14	35.71
Patella		1				1	.25	15	6.66
Proximal tibia		2		9		11	2.82	37	2.97
Distal tibia	2	4	1	14		21	5.38	150	14.00
Calcaneum	1	6	1	41		50	12.82	145	34.48
Astragalus	/1	2/2		9/1		15	3.84	112	13.39
Tarsal		1/1		3/2		7	1.79	74	9.45
Proximal metatarsal	3	1		13		17	4.35	96	17.70
Distal metatarsal		1	1	6		8	2.05	49	16.32
Metapodial		4		5/1		10	2.56	79	12.65
Sesmoid								109	-
1st toe		/2		4/5		11	2.82	140	7.85
2nd toe		/1		/2		3	.76	79	3.79
3rd toe			1	/1		2	.51	44	4.54
Dew claw								47	-
Total	21	56	7	304	2	390	99.82	3000	13.00

metapodial and phalanges) amounted to 9.71% of the total, while chewed elements of the front hock or "wrist" joint (proximal metacarpals, carpals and distal radius) accounted for 8.45% of the total. One other articular complex regularly chewed was the pelvis (5.12%). Elements of the lower leg and joints account for 75.83% of the dog-chewed bone, but including the pelvis, the percentage of dog-chewed bones becomes 80.98%. Deer elements which showed evidence of having been digested were the carpals, astragali, tarsals, distal metapodials and phalanges, all of which could be identified after digestion. The high frequency of dog-chewed elements from joints and the pelvis points to a selection of locations for chewing and not just a random chewing of all elements.

The data for all dog-and rodent-chewed and digested pieces of bone are presented in Table 10. Bones from 15 different animals exhibited evidence of animal alteration, including the 41% of the sample which were from indeterminate animals. One third of the altered bones were those of deer. No fish elements were observed that showed any evidence of attrition. The distribution by village area of elements with evidence of animal alteration provides some insight into the locales where the dogs and rodents were most active. The materials recovered from structure floor fill contained only a small number of chewed bones compared with those from the general midden and features. The West Village Area and Mound A had the fewest chewed elements. The majority of the chewed bone was recovered from the East Village Midden Area, the area of greatest midden accumulation.

The occurrence of dog-chewed and digested and rodent-chewed bones in an archaeological midden documents some of the attritional processes that took place during the deposition and accumulation of the Dallas

Table 10: Dog and Rodent-chewed/digested Bones.

Species	West Village Midden	West Village Feature	West Village Structure	West Village Total	North Village Midden	North Village Feature	North Village Structure	North Village Total	Mound A Midden	Mound A Feature	Mound A Structure	Mound A Total	East Village Midden Midden	East Village Midden Feature	East Village Midden Structure	East Village Midden Total	East Village Feature	East Village Total	Grand Total	%
Mammals																				
Gray Squirrel, Sciurus carolinensis							1	1											1	.09
Squirrel, Sciurus sp.							1	1											1	.09
Beaver, Castor canadensis							1	1											1	.09
Canid, Canidae		1	3	4					1			1	2			2			7	.67
Black Bear, Ursus americanus	3			3	4		2	6			2	2	56	2	4	62	2	2	75	7.23
Raccoon, Procyon lotor	1			1											1	1			2	.19
Cougar, Felis concolor	1			1									2			2			3	.29
cf. Elk, Cervus canadensis	1			1			1	1											2	.19
White-tailed Deer, Odocoileus virginianus	13	8	1	22	38	2	17	57	4	1	3	8	272	14	25	311	2	2	400	38.57
Antler, Cervidae			1	1									8	1	1	10			11	1.06
Indeterminate Mammal Bone Chewed	4	13	8	25	28	3	41	72	1		2	3	255	16	42	313	16	16	429	41.36
Indeterminate Mammal Bone Digested		1		1			4	4					33	3	1	37	3	3	45	4.33
Birds																				
Turkey, Meleagris gallopavo	1			1	1	1	1	3					7	1	2	10			14	1.35
Indeterminate Bird Bone Chewed	1			1															1	.09
Reptiles																				
Eastern Box Turtle, Terrepene carolina	1	3		4	8		1	9					2	7	2	11	1	1	25	2.41
Map/Slider Turtle, Graptemys/Chrysemys sp.													1			1			1	.09
Softshell Turtle, Trionyx sp.					1			1											1	.09
Turtle sp.					11			11						2		2			13	1.25
Snake sp.					1		3	4											4	.38
Amphibians																				
Frog/Toad, Rana/Bufo sp.														1		1			1	.09
Total	26	26	13	65	92	6	73	171	6	1	7	14	638	47	78	763	24	24	1037	99.00

refuse. Indeterminate mammal long bone pieces which showed evidence of dog-chewing may be the result of dogs chewing and cracking deer and bear bones. The quantitative effect of dogs and rodents on the alteration of such a diverse fauna as the one from Toqua would be difficult to calculate (e.g. Binford and Bertram 1977). However, these attritional processes must be considered in the discussion or interpretation of any faunal sample. Distribution of these animal chewed or digested elements can be used to identify areas of scavenger activity and where attritional processes may most strongly affect the faunal sample.

Structures

The large number of Dallas structures excavated at Toqua provide an opportunity to compare the internal distribution of faunal remains among certain structures and to compare structure contents among village areas. Seven structures (3, 9, 13, 14, 2, 4, 39b) containing large shell and vertebrate samples were tabulated (Tables 11, 12). The totals for each structure include faunal remains excavated from the floor and associated features and burials. Three of these structures (3, 14, 39b) were excavated in small enough units to facilitate a comparison of the internal distribution of remains. Structure 3 is considered to be a special function structure (Polhemus 1979, Pers. Comm.), while structures 14 and 39b represent habitation localities. The distribution of remains was examined in relation to the structure entrance, inferred sleeping areas and public versus sleeping/work areas.

The seven structures will be discussed separately and then grouped and compared by village area. Structure 9 was in West Village, Structures

Table 11: Vertebrate Remains From Structures.

	MV.	WV.	HD. A			EYM.	
	St. 3	St. 9	St. 13	St. 14	St. 2	St. 6	St. 39
Mammals							
Opossum, *Didelphis marsupialis*	1	1		1			
Eastern mole, *Scalopus aquaticus*	2				1		
Eastern cottontail, *Sylvilagus floridanus*	16		1	1	3	2	2
Eastern chipmunk, *Tamias striatus*	1	1					
Gray squirrel, *Sciurus carolinensis*	11						
cf. Gray squirrel, *Sciurus* cf. *carolinensis*	16			1	1	4	
Fox squirrel, *Sciurus niger*	3	1	1		2		1
cf. Fox squirrel, *Sciurus* cf. *niger*		1				1	
Squirrel, *Sciurus* sp.	54	13	3	14	11	6	21
Beaver, *Castor canadensis*	10			3		1	1
Marsh rice rat, *Oryzomys palustris*	17	2	2			2	1
Deer/White-footed mouse, *Peromyscus* sp.	3					1	
Eastern wood rat, *Neotoma floridana*				1	1		
Vole, *Microtus* sp.	1	1					
Mouse sp.	163	32	3	2	15	10	31
cf. Dog, *Canis* cf. *familiaris*	2	4			1		1
Gray fox, *Urocyon cinereoargenteus*				1			1
Fox, sp.	2	1					
Black bear, *Ursus americanus*	28	2	1	1		2	10
cf. Black bear, *Ursus americanus*		2			1		
Raccoon, *Procyon lotor*	18	1	1	1	4	1	6
River otter, *Lutra canadensis*	4						
Cougar, *Felis concolor*	1	1					
Bobcat, *Lynx rufus*	1				1	1	1
cf. Elk, *Cervus canadensis*	2						
White-tailed deer, *Odocoileus virginianus*	628	34	11	33	24	32	91
cf. Bison, *Bison bison*	1						
Cow/Elk/Bison, *Bos/Cervus/Bison*							1
Antler, Cervidae	85	9	2		1	1	309
Indeterminate Mammal Bone	19,305	668	360	1644	1462	689	1709
Total	20,375	774	385	1703	1528	753	2182
Birds							
Goose, cf. *Branta* sp.	1						
Goose sp.						1	
Mallard/Black duck, *Anas* sp.	3						
Pintail/Gadwall duck, *Anas* sp.					1		
Ringneck/Lesser scaup, *Aythya* sp.	1						
Duck sp. *Anas* sp.	2				1		1
Red-tailed hawk, *Buteo jamaicensis*	6						
cf. Red-shouldered hawk, *Buteo lineatus*	1						
Hawk sp. *Buteo* sp.	8						
Bobwhite, *Colinus virginianus*	2	1			1	1	3
Turkey, *Meleagris gallopavo*	26	11	6	20	3	7	11
cf. Turkey, *Meleagris gallopavo*	1	1				7	2
Sandhill crane, *Grus canadensis*							1
Passenger pigeon, *Ectopistes migratorius*	86						
cf. Passenger pigeon, *Ectopistes migratorius*	4						
Crow, *Corvus brachyrhynchos*						1	
Cardinal, *Richmondena cardinalis*	1						
Passerine,	15	3	2			1	1
Indeterminate Bird Bone	1740	50	62	323	183	58	127
Eggshell			5				
Total	1903	66	75	343	139	76	146

Table 11 (Continued)

	NY.	WV.	MD. A			EVM.	
	St. 3	St. 9	St. 13	St. 14	St. 2	St. 4	St. 19
Reptiles							
Snapping turtle, *Chelydra serpentina*	4	1		1		1	4
cf. Stinkpot, *Sternothaerus odoratus*	2					1	
Mud/Musk turtle, Kinosternidae	22	1			9	3	4
Eastern box turtle, *Terrapene carolina*	1029	171	100	75	135	69	227
Map turtle, *Graptemys geographica*		1					
Painted turtle, *Chrysemys picta*	1						
Slider/Map/Painted turtle, *Pseudemys*/*Graptemys*/*Chrysemys*	26	1			12	9	9
Softshell turtle, *Trionyx* sp.	72		1	1	5	2	8
cf. Spiny softshell turtle, *Trionyx spiniferus*	1						
Turtle sp.	2300	76	31	10	167	34	271
Nonpoisonous snakes, Colubridae	301	20			28	7	92
Poisonous snakes, Viviparidae	46	4	1		4	4	28
Snake sp.	52	24	1		3	1	33
Total	3856	299	134	87	363	131	676
Amphibians							
Hellbender, *Cryptobranchus alleganiensis*	10	2			3		1
Eastern spadefoot, *Scaphiopus holbrooki*	19	2			1		
Bullfrog, *Rana catesbiana*	2				1		
Frog, *Rana* sp.	20				1		2
Toad, *Bufo* sp.	11	2			4	3	4
Frog/Toad, *Rana*/*Bufo*	25	7	1	3	8	1	23
Total	87	13	1	3	18	4	30
Fishes							
Sturgeon, *Acipenser* sp.		1					
cf. Longnose gar, *Lepisosteus osseus*	1						
Gar, *Lepisosteus* sp.	9	6		1	4		4
Pike, *Esox* sp.	1					1	
River redhorse, *Moxostoma carinatum*	22	7	2	12	5		5
Redhorse, *Moxostoma* sp.	42	10	11	13	4	15	5
Sucker, Catostomidae	85	15	22	12	20	24	7
Channel/Blue catfish, *Ictalurus* sp.			1	3			1
Catfish/Bullhead, *Ictalurus* sp.	3				1		
Flathead catfish, *Pylodictis olivaris*						1	
Madtom, *Noturus* sp.		1					
Catfish, Ictaluridae				1			1
Bass, *Micropterus* sp.	2					2	1
Sunfish/Bass, Centrarchidae	2						
Freshwater drum, *Aplodinotus grunniens*	55	7	11		17	10	30
Indeterminate fish bone	1048	107	231	184	143	145	82
Fish scales	133	169	15	1	119	76	54
Total	1403	323	293	207	313	274	190
Grand Total	27,624	1475	888	2343	2411	1233	3224

Table 12: Mollusk Remains by Structure.

	St. 3	St. 9	St. 13	St. 14	St. 2	St. 4	St. 39
Pelecypods							
Amblema plicata	3	1					2
Fusconaia barnesiana	2			2	6	1	8
Fusconaia cf. barnesiana							3
Fusconaia subrotunda	18		1	12	8	2	69
Fusconaia cf. subrotunda					1		
Quadrula cylindrica				1			
Quadrula metanevra						1	
Cyclonaias tuberculata	2				1	2	1
Elliptio crassidens	9			1			3
Elliptio dilatatus	17	7	2	18	14	11	44
Lexingtonia dolabelloides	1						
Plethobasus cooperianus							2
Pleurobema cordatum	1					4	
Pleurobema oviforme	1					1	2
Pleurobema cf. oviforme	1						
Pleurobema plenum	1					1	
Pleurobema pyramidatum					1	1	
Actinonaias ligamentina	36				2	6	7
Epioblasma arcaeformis						1	
E. arcaeformis/triquetra						1	
Epioblasma haysiana					2		2
Epioblasma propinqua						3	1
Epioblasma torulosa							1
Epioblasma cf. capsaeformis				7	1		
Lampsilis fasciola	1				1	1	
Lampsilis ovata	23			1	1	2	2
Conradilla caelata						1	
Ligumia recta	2						1
cf. Medionidus conradicus				10			
Obovaria cf. subrotunda	1						
Proptera alata	1						
Villosa cf. vanuxemi				2			1
Dromus dromas	5				5	24	15
Ptychobranchus fasciolare	5	1				1	2
Ptychobranchus subtentum	49		1	2	1	2	15
Indeterminate Pelecypods	157	11	4	56	53	14	101
Total	336	20	8	112	97	80	282
Aquatic Gastropods							
Athearnia cf. anthonyi	11			1			4
Campeloma sp.	6						2
Io fluvialis	10				1		
Leptoxis praerosa	484		9	2	52	27	225
Pleurocera canaliculatum	1654	18	23	15	169	62	419
P. curtum/unciale	52				2		18
Lithasia verrucosa	32		3		11	1	13
Goniobasis archnoidea	3		1				
Pleurocerids	834	2	2	3	17	7	84
Helisoma sp.		1					
Total	3086	21	38	21	252	97	765
Terrestrial Gastropods	157		5	1			1
Marine							
Busycon , worked	1						
Disc				1	1		
Beads	7	1	75	27	6	3	
Whorls				7			
Columella				8			
Marginella	7				1		
Cockle	1						
Total	16	1	75	43	8	3	
Grand Total	3595	42	126	177	357	180	1048

13 and 14 were located on Mound A, Structure 3 was in North Village and Structures 2, 4, and 39b were all located in the East Village Midden Area.

The floor deposits from all structures except Structure 39b were each treated as a single unit, although they represented a long term accumulation and possibly even several structural rebuildings. The structures are not all contemporaneous (e.g. Structure 13, Mound A, phase G and H; Structure 14, Mound A, phase E), but they can be used to evaluate the general pattern of faunal debris accumulation by the Dallas people.

The three structures to be closely examined were all rectangular with four main support posts and a central hearth. The area between the outer wall of the structure and the interior support posts, sometimes represented by a prepared clay bench, is designated as a private, work or potential sleeping area. This condition differs from the public or family floor area that included the hearth and all of the floor area inside the four main support posts. The southwest corner of domestic structures, often the location for burials, has been suggested as the sleeping area (Polhemus 1979, Pers. Comm.). The placement of burials under sleeping areas was apparently a common practice among historic Indian groups of southeastern United States (Williams 1930:195; Webb 1938: 112-113).

Faunal remains from domestic structures can be expected to have a regular pattern of distribution. The sleeping areas, inferred from location of the burials (southwest corner), would be relatively free from all but the smallest bits of refuse, while work areas would have only a small amount of debris and artifacts. The public floor area around the hearth should be relatively clear with refuse accumulation expected close to the front of the bench, along the walls and partitions and in corners of the structure. Polhemus (1980, Pers. Comm.) observed that refuse had accumulated generally in the southeast corner of domestic structures. Lewis and Kneberg (1946:54-55) observed that the floors of domestic structures were never paved or swept and were always covered with loose dirt. This lack of cleaning and sweeping would allow for the rapid inclusion of any dropped object into the floor deposit. The pattern of domestic faunal debris should be very similar between the mound and village.

The distribution of the faunal remains in Structure 3 should have some of the characteristics typical of the domestic structures: i.e., faunal debris along the leading edge of the benches and in the southeast corner on both the public floor and bench areas but absent from the central floor area. Structure 3 was constructed on a floor pattern similar to domestic structures only larger; it may be assumed to have been used in a similar manner. Dog-chewed remains would be expected in the domestic structures in the village and possibly in the special function structure, but absent from the status structures on the mound. Dogs may have been excluded from the mound summit if the mound structures were used to bury high status dead or were deemed sacred.

Structure 2

This large structure was located in the East Village Midden Area. Structure 2 represents at least four different rebuildings of a structure on the same location. The largest structure was 30 x 31 feet. Two former structures built on this location had burned. The last structure had a prepared clay hearth and a door in the east wall. Very little faunal material was recovered from the floor areas. This lack of faunal material may be due to the clearing and preparation for the frequent rebuilding that took place. The majority of the material was found in features within the floor area (Tables 11,12). Nineteen burials were associated with this structure, 10 containing shell associations and 2, bone artifacts. Four of the burials were accompanied by marine shell beads, one by a conch columella earpin and one by an indeterminate shell fragment. One burial contained a marine conch shell mask and a turkey tarsometarsal awl. A burial with shell beads was also accompanied by an antler tine.

Structure 3

This was the largest Dallas structure excavated at Toqua and was located on the north flank of Mound A, North Village (Figure 1, pp. 9). This 38 by 38 foot burned structure was excavated in 4-foot squares (Figure 5) and the contents of each was waterscreened. The structure's size and the excavation techniques employed provide a unique opportunity to examine the spatial distribution of faunal remains in this floor sample.

Careful excavation of this structure resulted in the recovery of a large sample of mollusks (3574) and vertebrate (27,624) remains; these were recorded by four foot squares within the structure. This faunal sample, combined with the structural remains, provided an opportunity to examine activity loci and midden formation in a structure that was probably not purely a domestic structure (e.g. Structure 39b). Thirteen four foot squares in Structure 3 were possibly intruded by the historic Cherokee Structure 59. However, none of the faunal material recovered

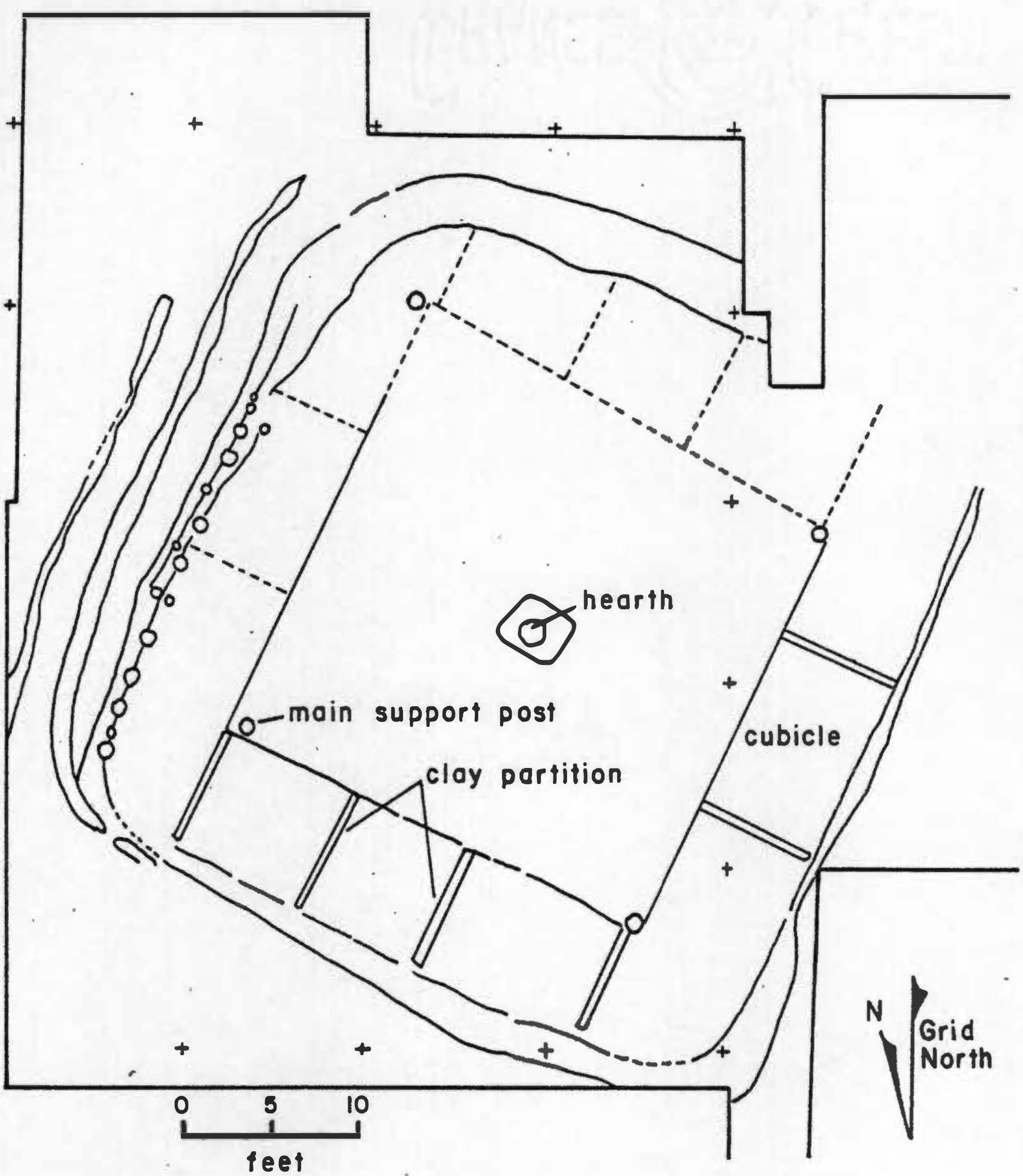

Figure 5. Floor Plan of Structure 3, North Village.

from the Structure 3 floor deposits in these squares provided any evidence of disturbance.

The faunal ramains from this building will be discussed in relation to the interior architecture (Figure 5). The public and hearth areas are those areas inside the four main roof supports, or the center floor area of the structure. This is separate from personal or private areas that include those areas between the mains support posts and the outer wall of the structure. This space was broken into compartments by clay partitions along the south and east walls and these partitions are indicated by dashed lines as possibly having been present along the north and west walls (Figure 5).

The molluscan remains were plotted by excavation unit and examined for distribution patterning (Figure 6). The greatest concentration of mollusks was along the middle of the east wall on the bench between the clay partitions, with some spilling over into the public area. Smaller concentrations occurred in the northwest and southwest corners. The mollusks were plotted by pelecypods, aquatic gastropods and terrestrial gastropods (Figures 7, 8, 9). The pelecypods and aquatic gastropods were concentrated in the central cubicle along the east wall. The pelecypods were also grouped along the middle of the west wall and were absent or in very low numbers around and west of the hearth. Valves of muckets were found almost exclusively in the public area to the south and east of the hearth and in the center cubicle on the east wall. Two pocketbook valves were found near the hearth, 3 along the west wall, 3 in cubicles along the south wall, 10 in the cubicles along the east wall and 4 valves in the northeast corner. The compressed and elongate

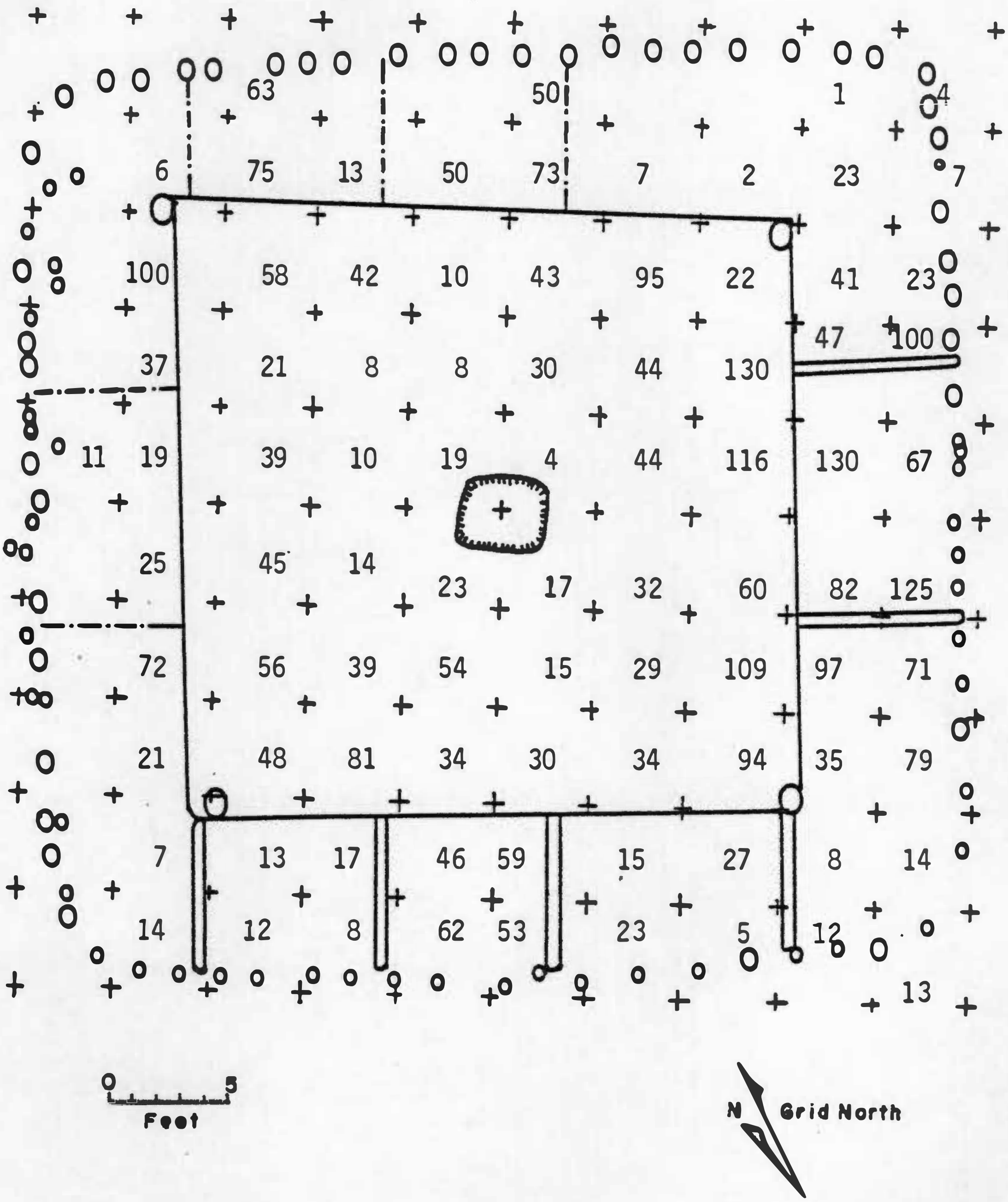

Figure 6. Structure 3: Distribution of All Molluscan Remains.

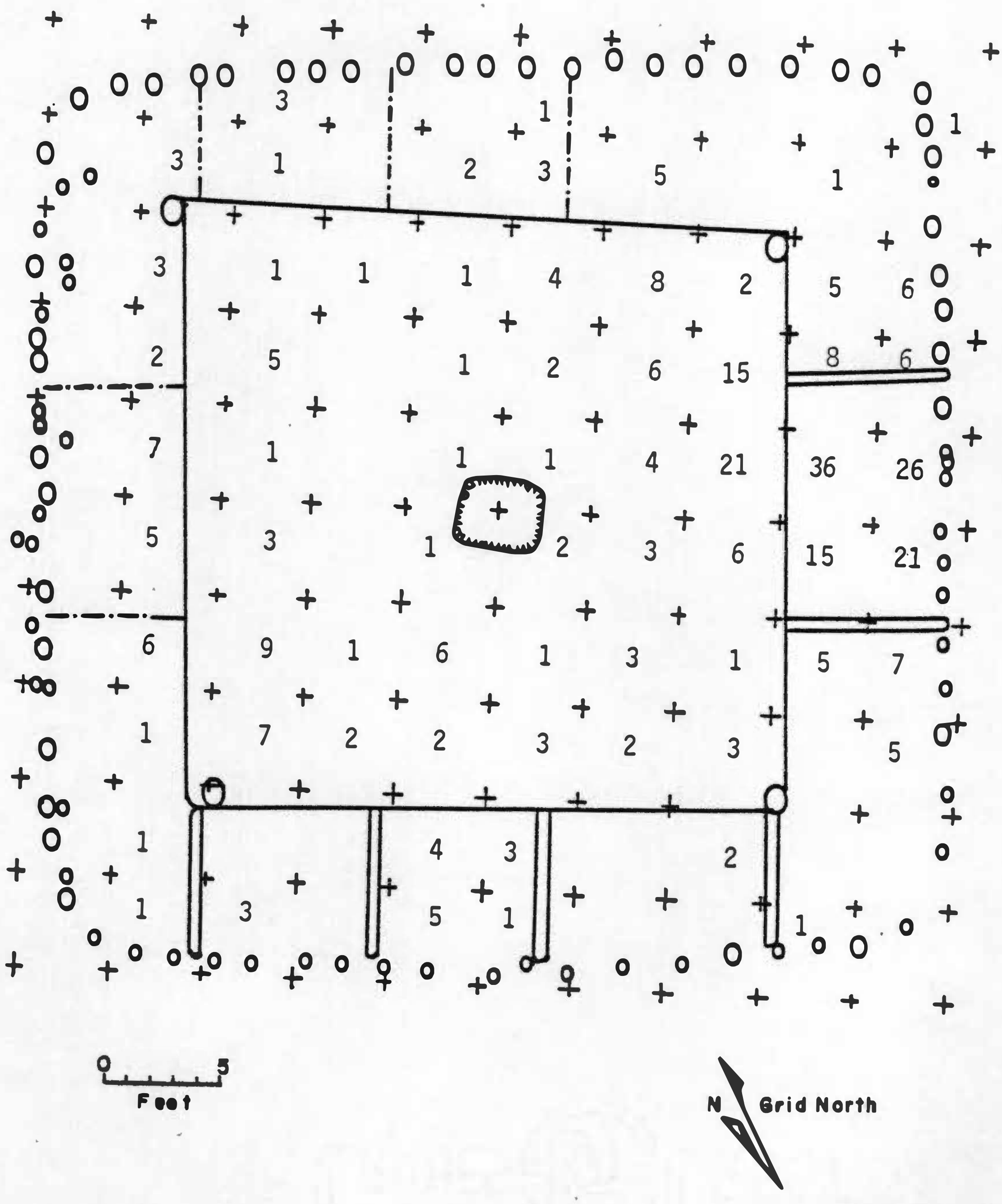

Figure 7. Structure 3: Distribution of Freshwater Pelecypods.

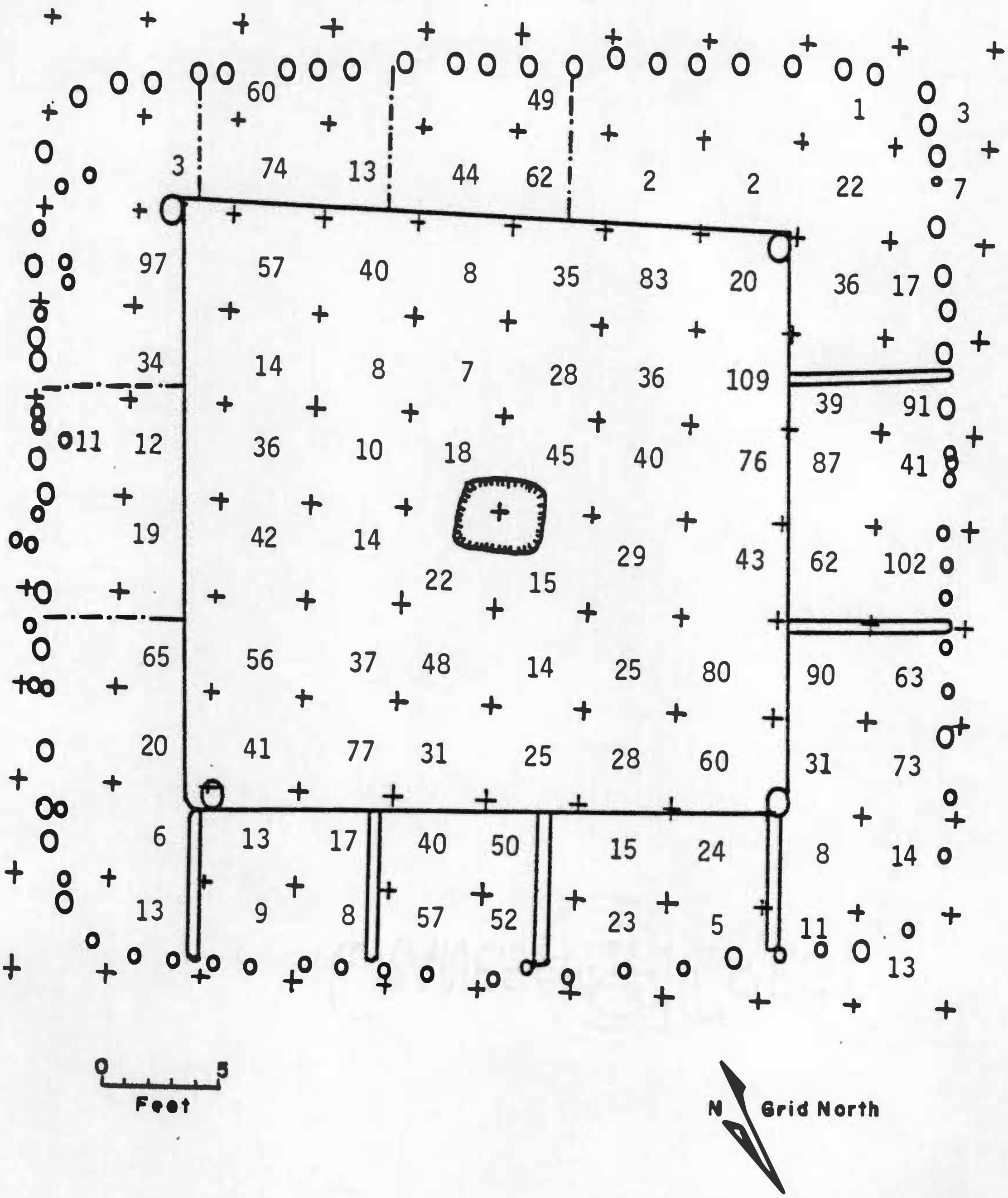

Figure 8. Structure 3: Distribution of Freshwater Gastropods.

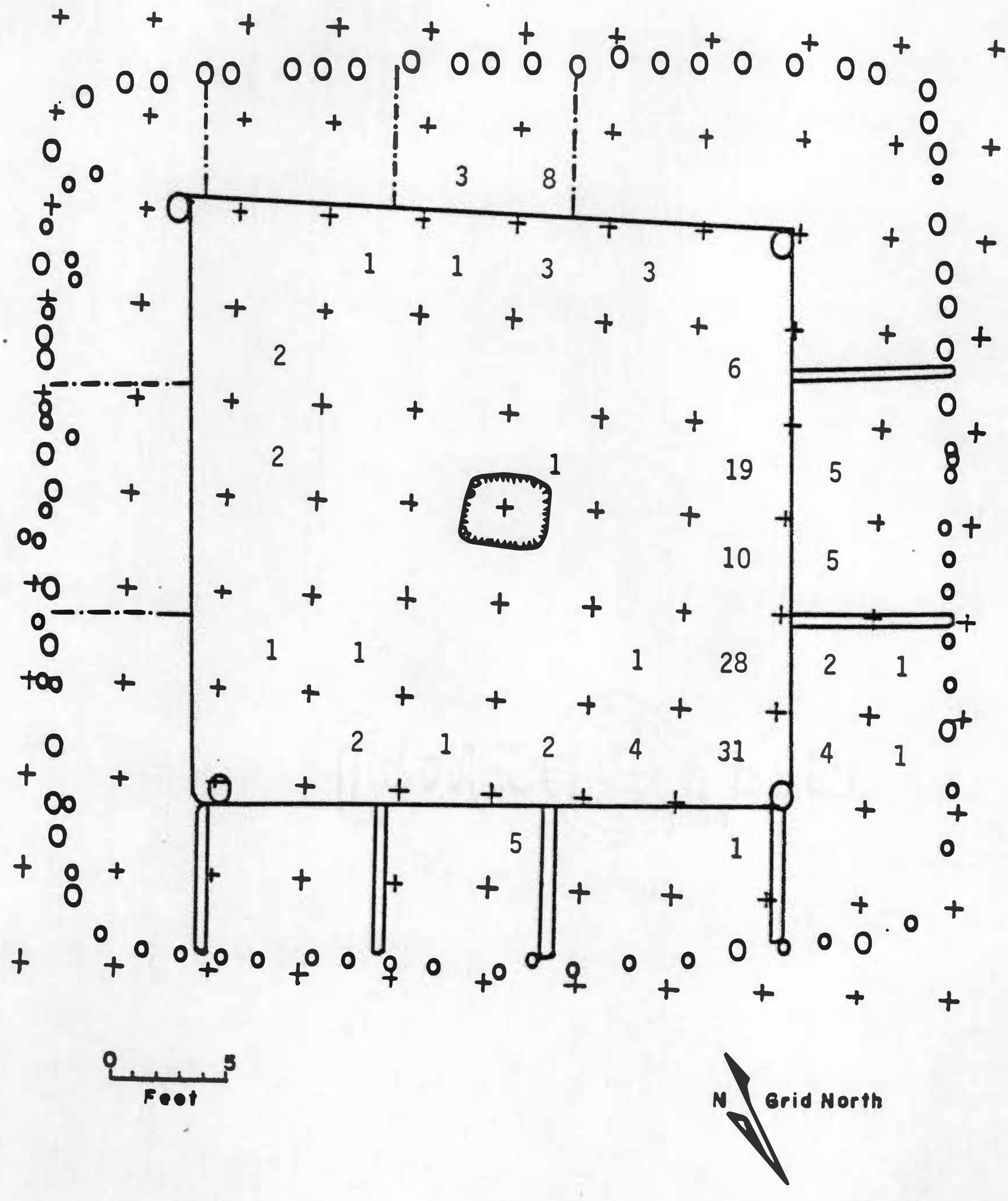

Figure 9. Structure 3: Distribution of Terrestrial Gastropods.

species (spike, fluted kidney shell) were concentrated in the central cubicle on the east wall. The aquatic gastropods were clustered in the middle of the south, west and north walls on the bench area (Figure 8). The concentration in the east of the structure graded from a low at the hearth to the major concentration in the middle cubicle on the east wall. The distribution of land snails also form an interesting pattern (Figure 9). They were found in a circle about 10 feet from the hearth and were concentrated in the public area in front of the center and southern cubicle along the east wall and within these two cubicles.

The marine shell items recovered from Structure 3 consisted of a drilled cockle shell, one drilled conch shell fragment, seven marine conch shell beads and seven *Marginella* beads. The drilled conch fragment was recovered from the bench on the north wall, while three shell beads and one *Marginella* bead were recovered from the public area immediately in front of the bench (Figure 10). Two marine conch shell beads and one *Marginella* shell bead were recovered from the middle of the bench along the west wall. Two *Marginella* and one marine conch shell bead were recovered from the central cubicle on the south wall. The drilled cockle shell, one marine conch shell bead and two *Marginella* beads were recovered from the central cubicle along the east wall. One *Marginella* bead was found in the floor on the public area immediately adjacent to this cubicle.

The distribution of the shell artifacts, unmodified bivalves and terrestrial and aquatic gastropods points to one major activity area in the central cubicle along the east wall. Lesser concentrations of debris occurred in the central cubicle on the south wall and on the bench area along the middle of the west and north walls. The northeast area

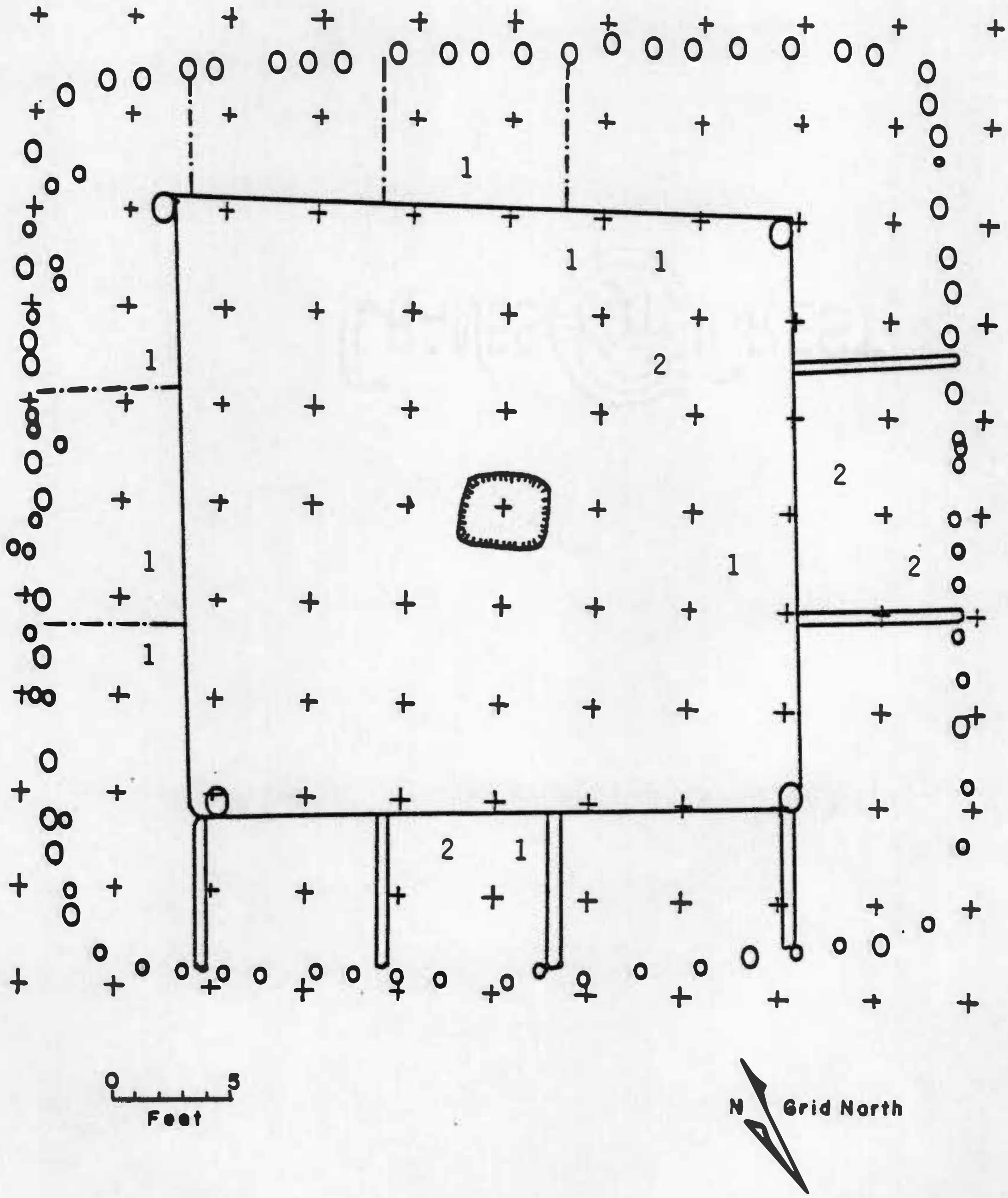

Figure 10. Structure 3: Distribution of Marine Shell.

of the public floor was relatively clear of molluscan debris. The pattern of land snails ringing the central hearth may be interpreted in conjunction with the bivalves and aquatic gastropods. The terrestrial snails were probably attracted to the floor area by the freshwater shells and were living in the floor debris using the shells as a source of calcium. If this was the case, it points out the stability of the accumulated debris on the floor in the public area, at least on the east side of the hearth in front of the clay bench. This accumulation would have been approximately at the point often designated at the pitch zone (Binford 1978b:345, 365).

The large sample of vertebrate remains from the floor of Structure 3 provides an insight into refuse accumulation within a special function structure. The total bone counts for each square were plotted (Figure 11). The greatest concentration occurred in the cubicle along the center of the east wall and in the area immediately in front of this cubicle in the public floor area. Other smaller concentations were located in the center cubicle along the south wall, the southwest corner of the public floor area and one in the northeast corner of the structure extended to the middle of the north wall.

Deer, bear, squirrel, mouse and river otter remains were considered with respect to possible patterning in their distribution within the structure. River otter elements occurred along the north clay partition of the middle cubicle along the east wall. These otter remains were from a skin or personal bundle present in the structure. White-tailed deer remains were concentrated along the east wall, particularly in the middle cubicle (Figure 12). Deer remains on the public floor area were very sparse in the northwest corner of the floor, but increased in

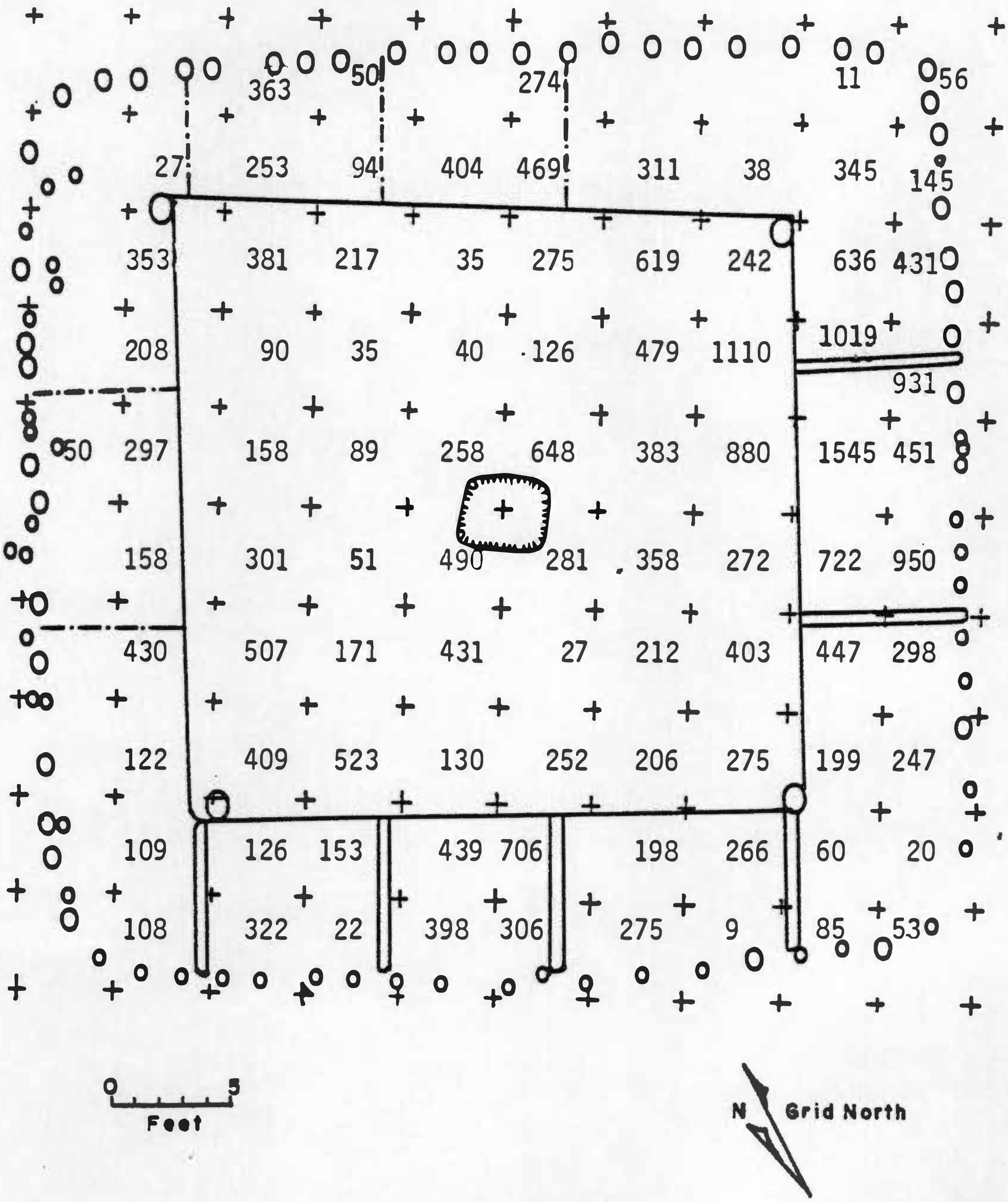

Figure 11. Structure 3: Distribution of All Vertebrate Remains.

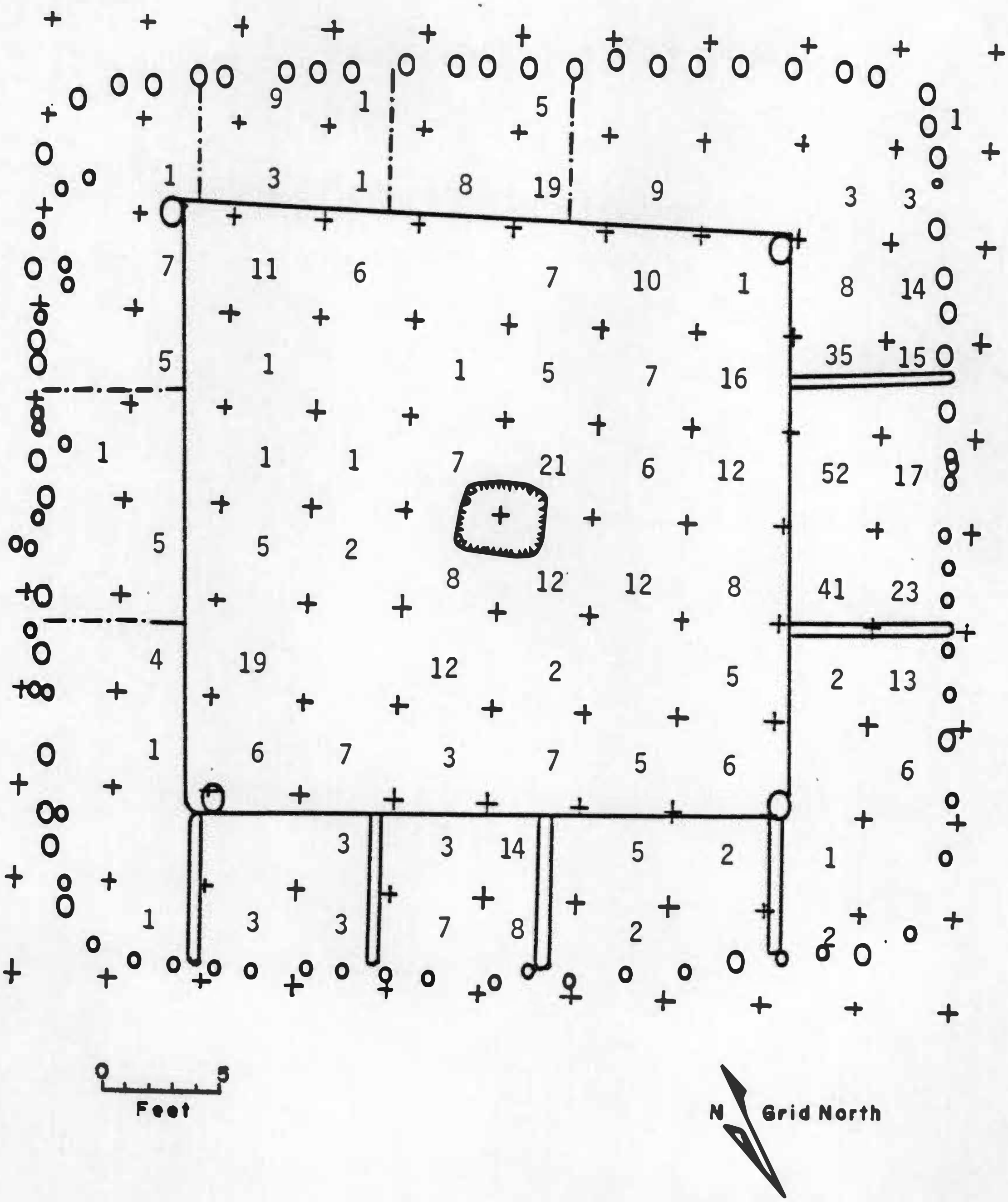

Figure 12. Structure 3: Distribution of White-tailed Deer.

density east of the hearth and in the southwest corner close to the bench. Bear remains were restricted to the middle cubicle along the east wall and in the northeast and southeast corners of the public floor area (Figure 13). All of the squirrel bones were combined and plotted (Figure 14); they occurred almost exclusively on the public floor area. Raccoon remains were found on the public floor area in the northeast corner, the southwest corner and the southwest end of the bench along the south wall. Mouse remains were examined for possible distributional patterns, since these animals were probably intrusive, living in the structure with its human occupants (Figure 15). Their bones were scattered in the southwest and southeast corners but concentrated in the northeast corner of the public floor area. Outside the public area, mouse elements were found scattered on the bench area, but concentrated in the middle cubicle along the east wall. Mice probably lived among and fed on the accumulated debris along the east wall.

Bird remains were concentrated in the northeast corner, including the center and northern cubicles along the east wall and the public floor space in the northeast corner (Figure 16). They also clustered in the center cubicle along the south wall and in the southwest corner of the public floor area. The southeast corner of the bench area had very few bird remains as did the public floor area north and west of the central hearth. Fourteen of the 21 turkey elements were found in the bench area along the north and east walls. The other seven turkey elements were scattered east and south of the hearth on the public floor. The mallard, ring-necked duck and other duck remains were all found in the public floor area immediately in front of the middle cubicle on the south wall; the Canada goose element occurred on the floor area in front of the middle

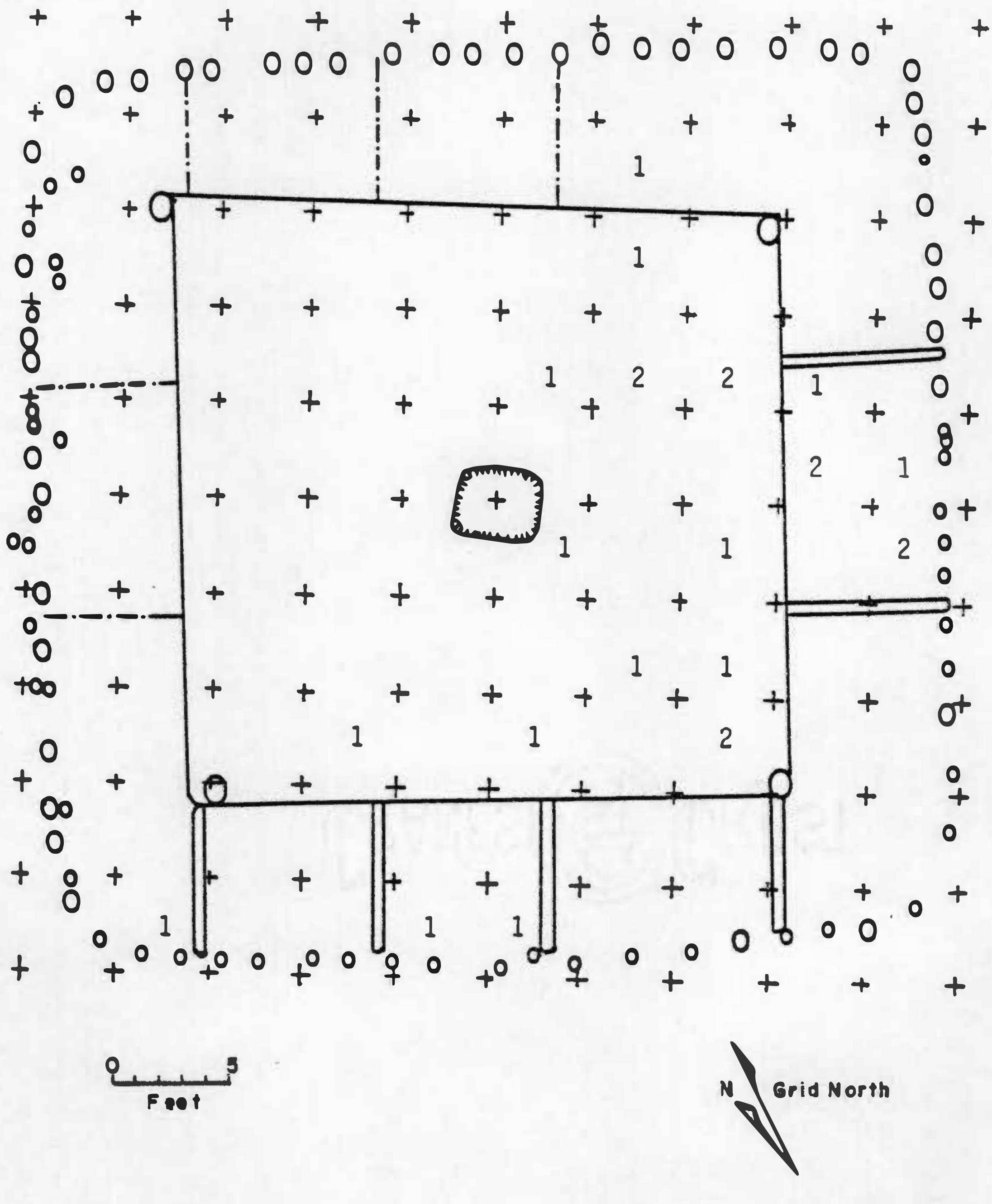

Figure 13. Structure 3: Distribution of Bear Remains.

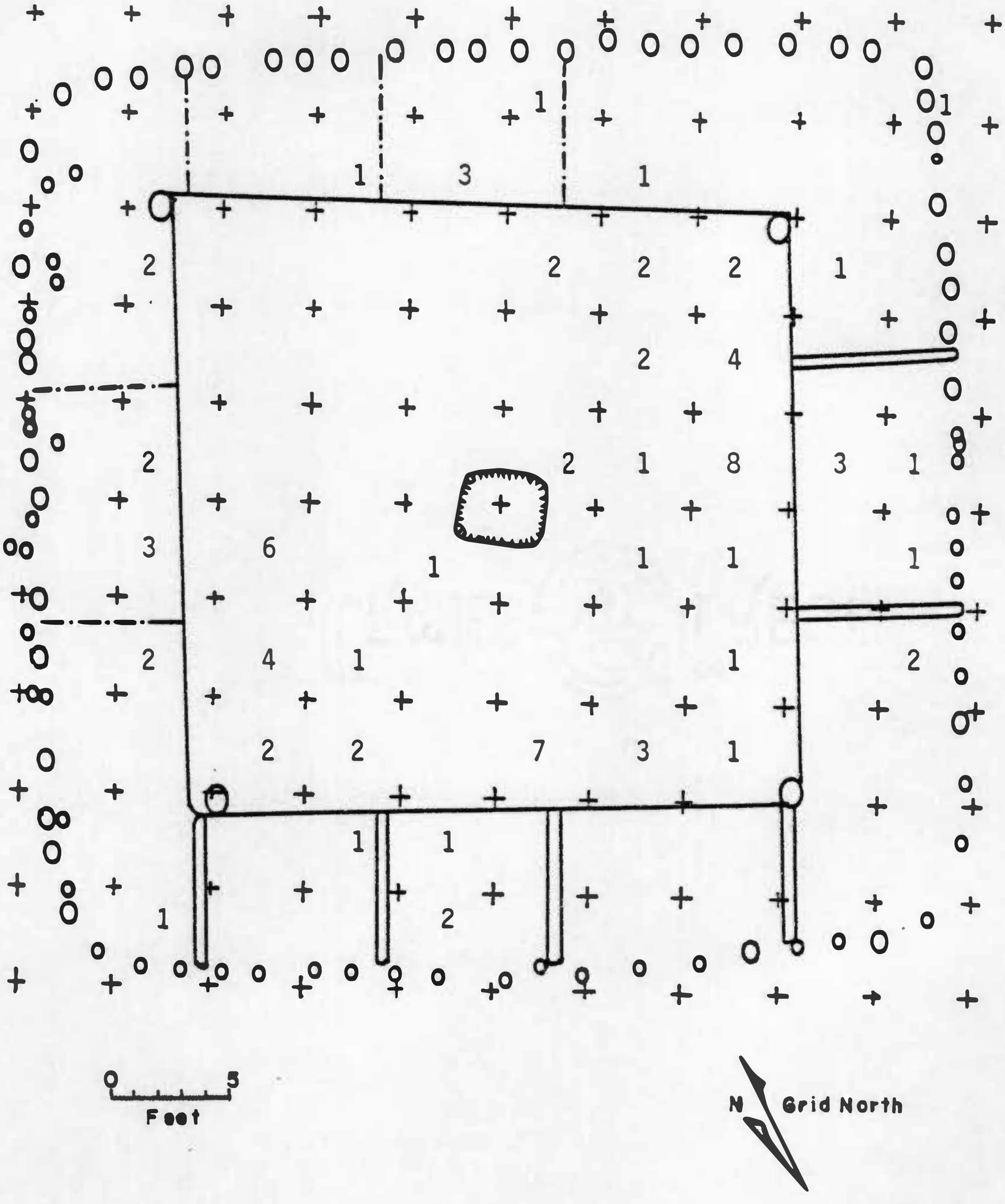

Figure 14. Structure 3: Distribution of All Squirrel Remains.

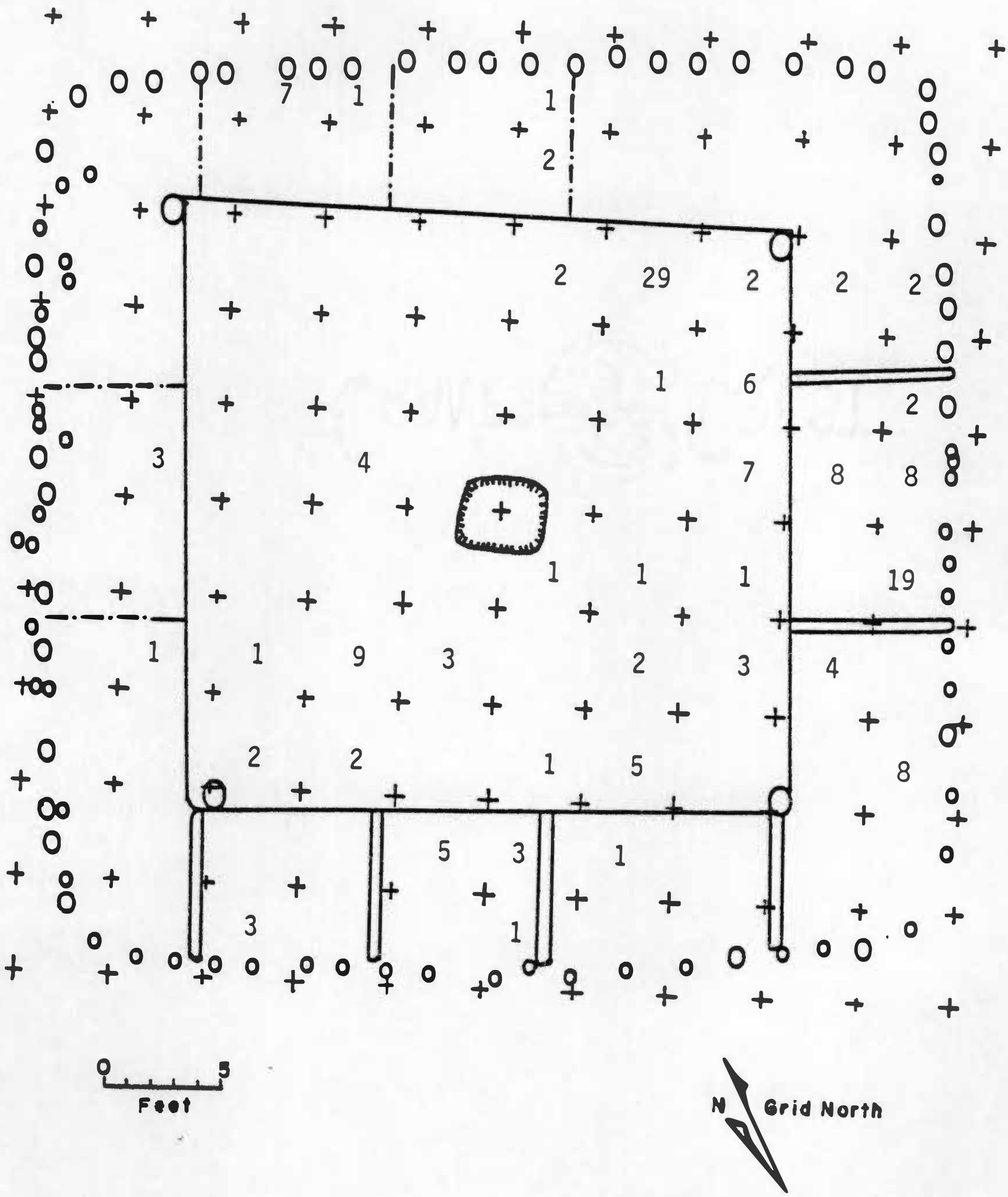

Figure 15. Structure 3: Distribution of Mouse sp. Remains.

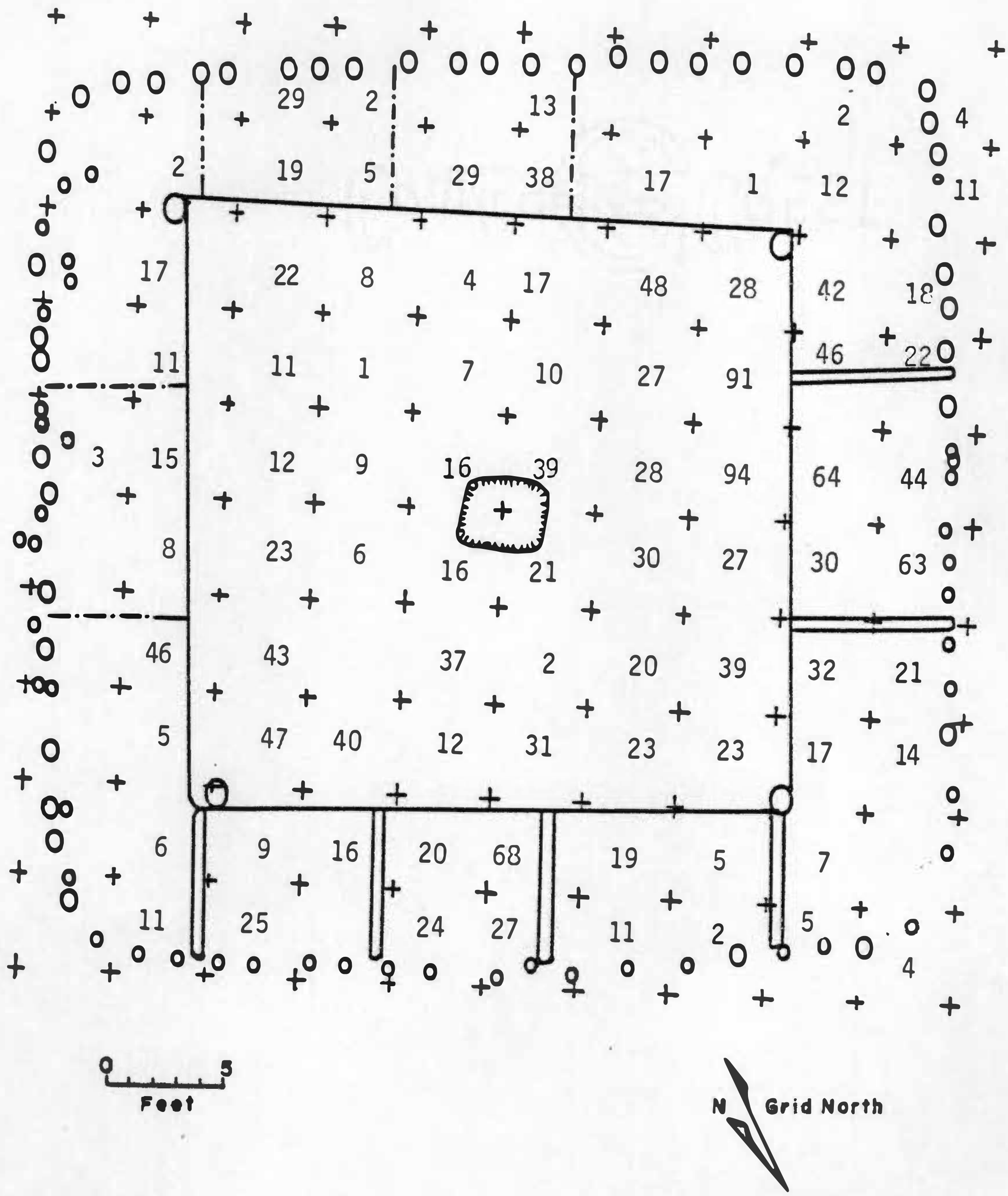

Figure 16. Structure 3: Distribution of All Avian Elements.

cubicle on the east wall. Passenger pigeon remains were scattered in the southwest corner and across the eastern half of the public floor area; few of the elements occurred in the cubicle or bench areas (Figure 17). Passerine remains were concentrated in the southeast corner of the center cubicle along the east wall and the eastern half of the public floor area. Raptor remains were concentrated in the southeast corner of the center cubicle along the east wall. Three hawk claws, three digits and four red-tailed hawk elements (distal tarsometatarsus, terminal digit, distal radius and second digit) were found in the back corner of this partition. On the other side of the clay partition two other red-tailed hawk elements (distal ulna and carpometacarpus) were recovered. Two hawk claws occurred in the public floor area and one distal tarsometatarsus, which compared closely with the red-shouldered hawk, was recovered from the western-most cubicle along the south wall. The red-tailed hawk remains and the hawk claws from along the east wall are all probably from a single hawk skin that may have been hanging on the wall at the time the structure burned. The red-shouldered hawk element may have been part of a skin or an amulet. The bird remains were concentrated in the southeast and northeast corner of the public floor areas, with clusters in three of the small cubicles.

Box turtle remains clustered in the middle cubicles of the south and east walls as well as in the public area between the hearth and the east wall and in the southwest corner (Figure 18). The distribution of snake vertebrae is similar to the box turtle remains--highest in the bench area along the east walls but especially in the middle cubicle. A large number of snake vertebrae were identified from the southeast corner of the public floor and from one square next to the central hearth.

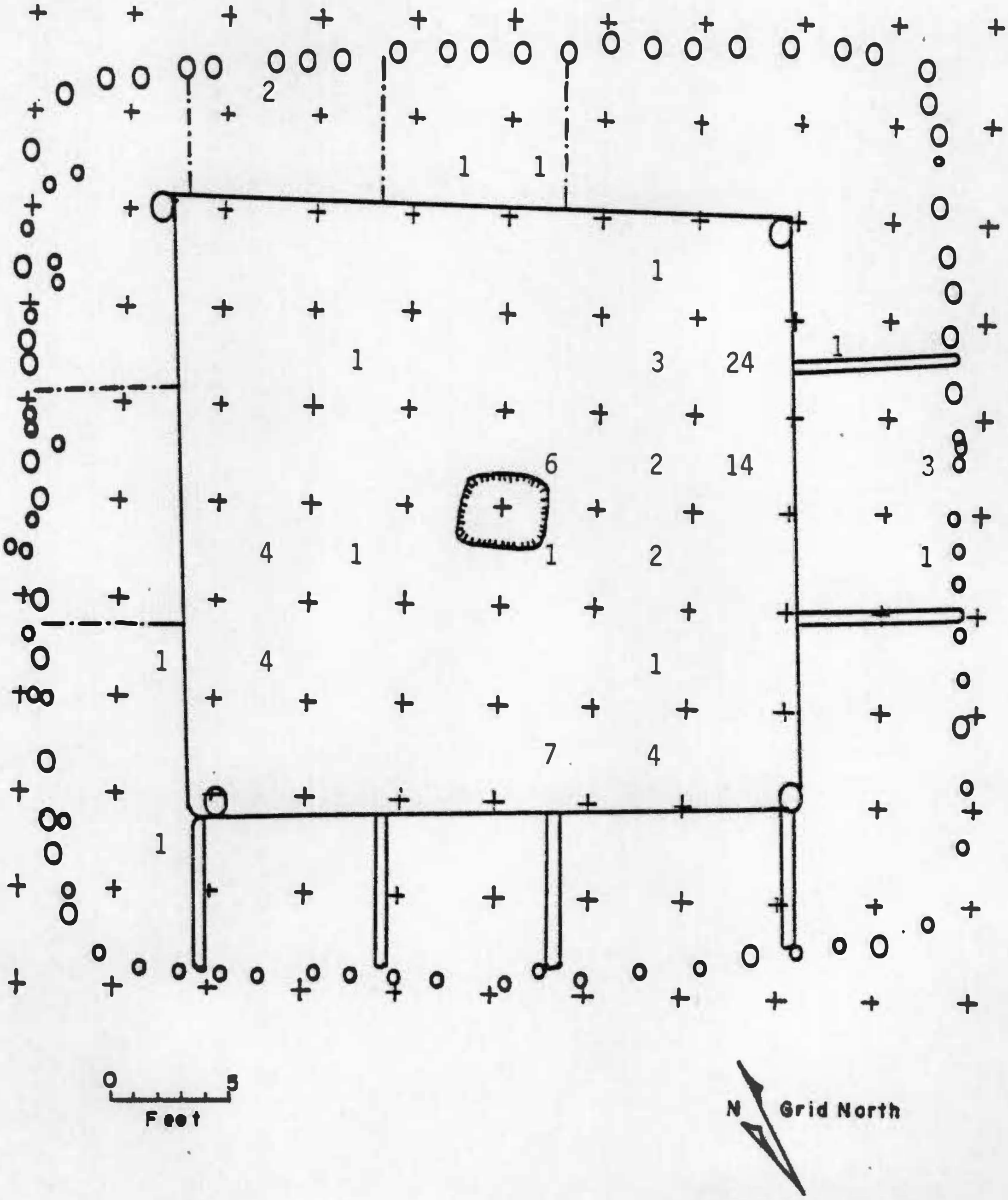

Figure 17. Structure 3: Distribution of Passenger Pigeon Elements.

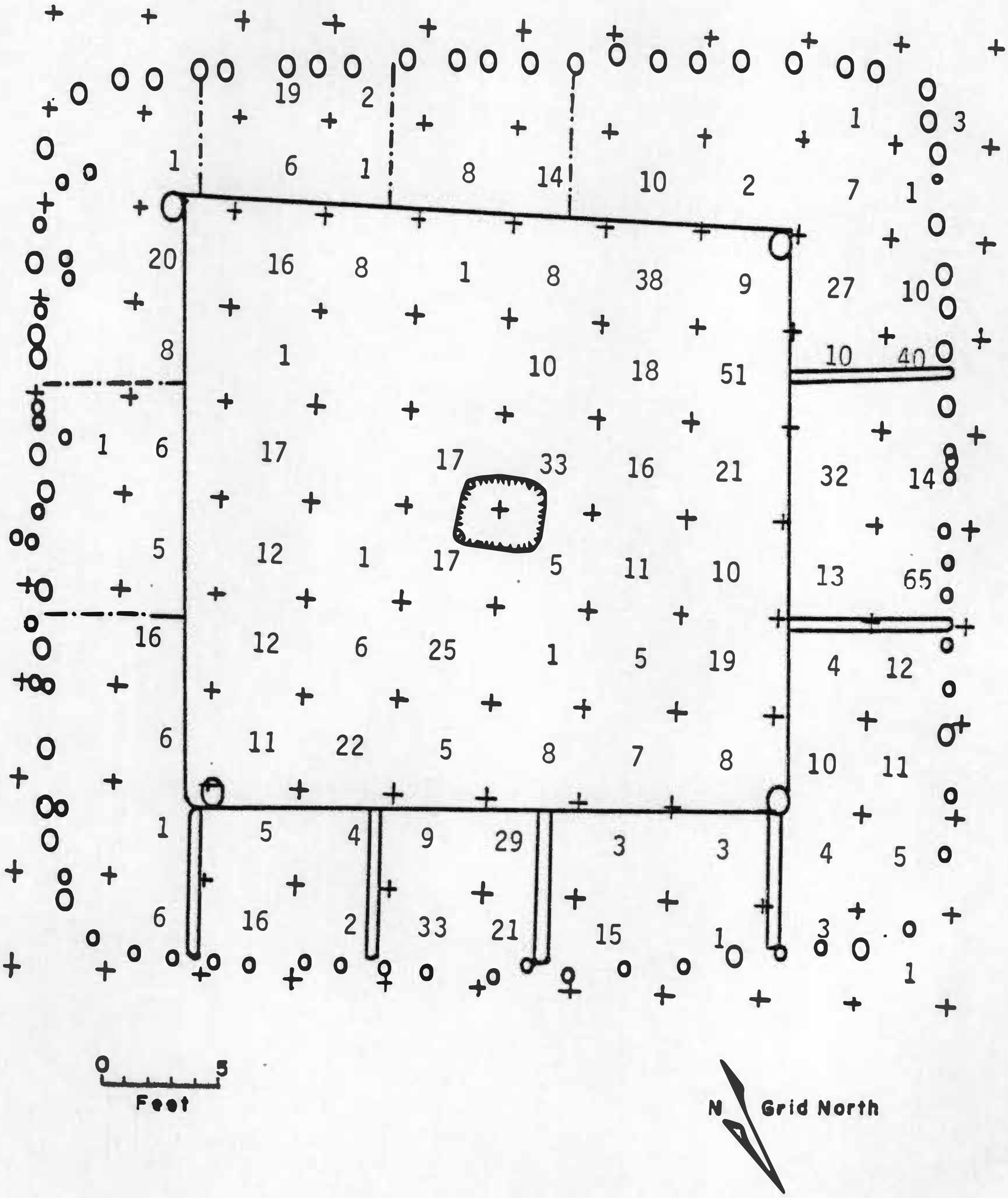

Figure 18. Structure 3: Distribution of Eastern Box Turtle Remains.

Amphibian remains were concentrated along the back half of the central cubicle on the east wall. They were scattered across the public area immediately in front of and to the northeast of the central cubicle along the east wall. A few remains clustered in the southwest corner of the structure.

Fish remains formed two distinct major clusters and two smaller more tenative groupings (Figure 19). The major cluster was centered in the middle cubicle on the east wall, with some elements spilling over into the cubicles on either side and into the northeast corner of the public floor. The other major cluster was located in the southwest corner of the public floor area, with smaller clusterings noted in the center cubicle along the south wall and in the northwest corner on the bench and public floor area. The floor area north and west of the hearth was relatively clear of fish remains. Fish scales were found almost exclusively in the eastern half of the public floor area, with concentrations in the northeast corner. The west and especially northwest corner of the public floor did not contain fish scales. The remains of suckers, the most numerous of the identified fish elements, were lumped together as a unit and their distribution plotted (Figure 20). The greatest number of sucker elements were found in the center cubicle along the east wall. Smaller clusters occurred in the northeast corner of the public floor, the southwest corner of the public floor and the middle cubicle along the south wall. Sucker remains were noticably absent from the northeast quarter of the public structure.

Two muddauber nests were recovered from the middle cubicle along the east wall. These clay casings document the nesting of wasps in the structure.

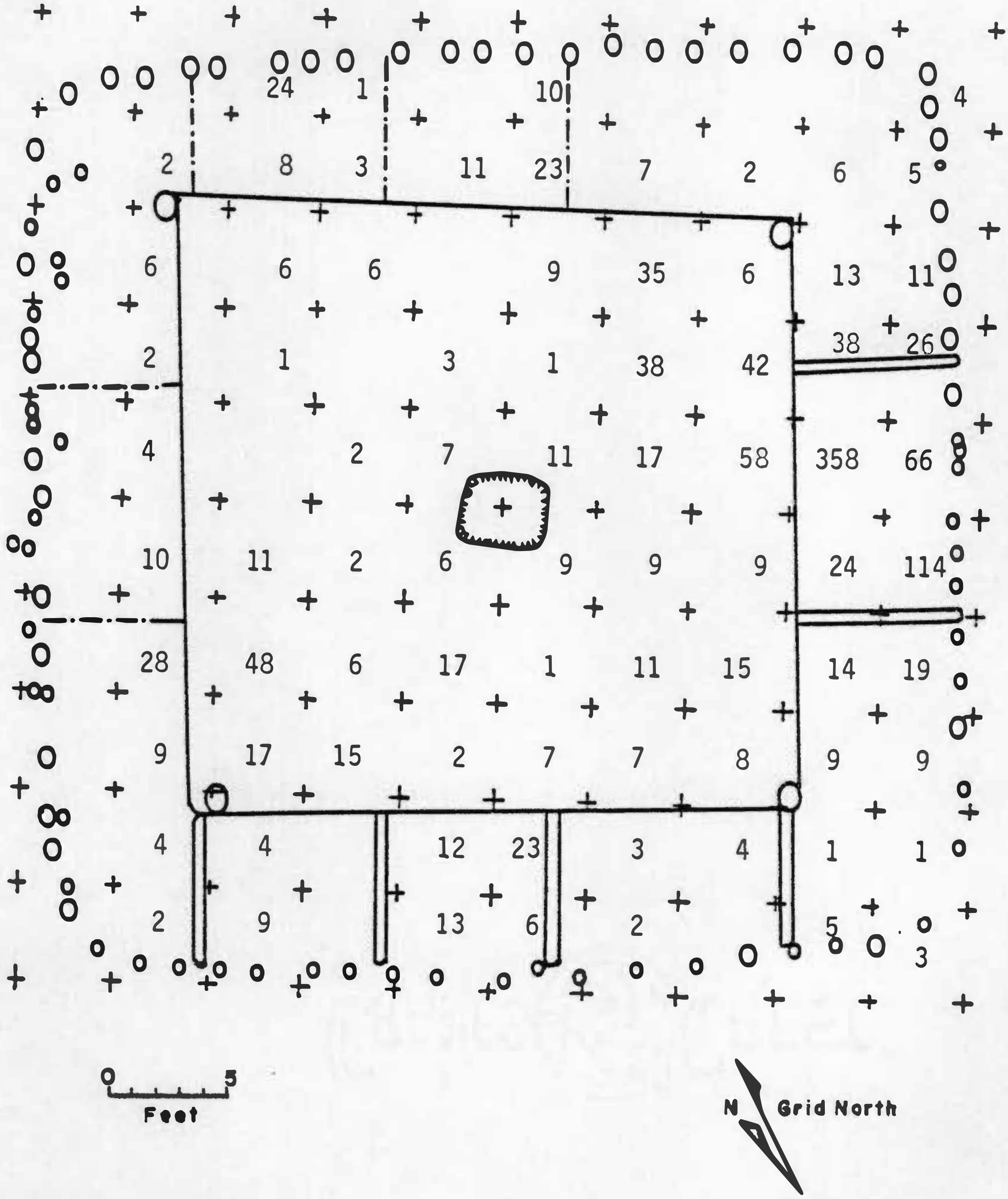

Figure 19. Structure 3: Distribution of All Fish Remains.

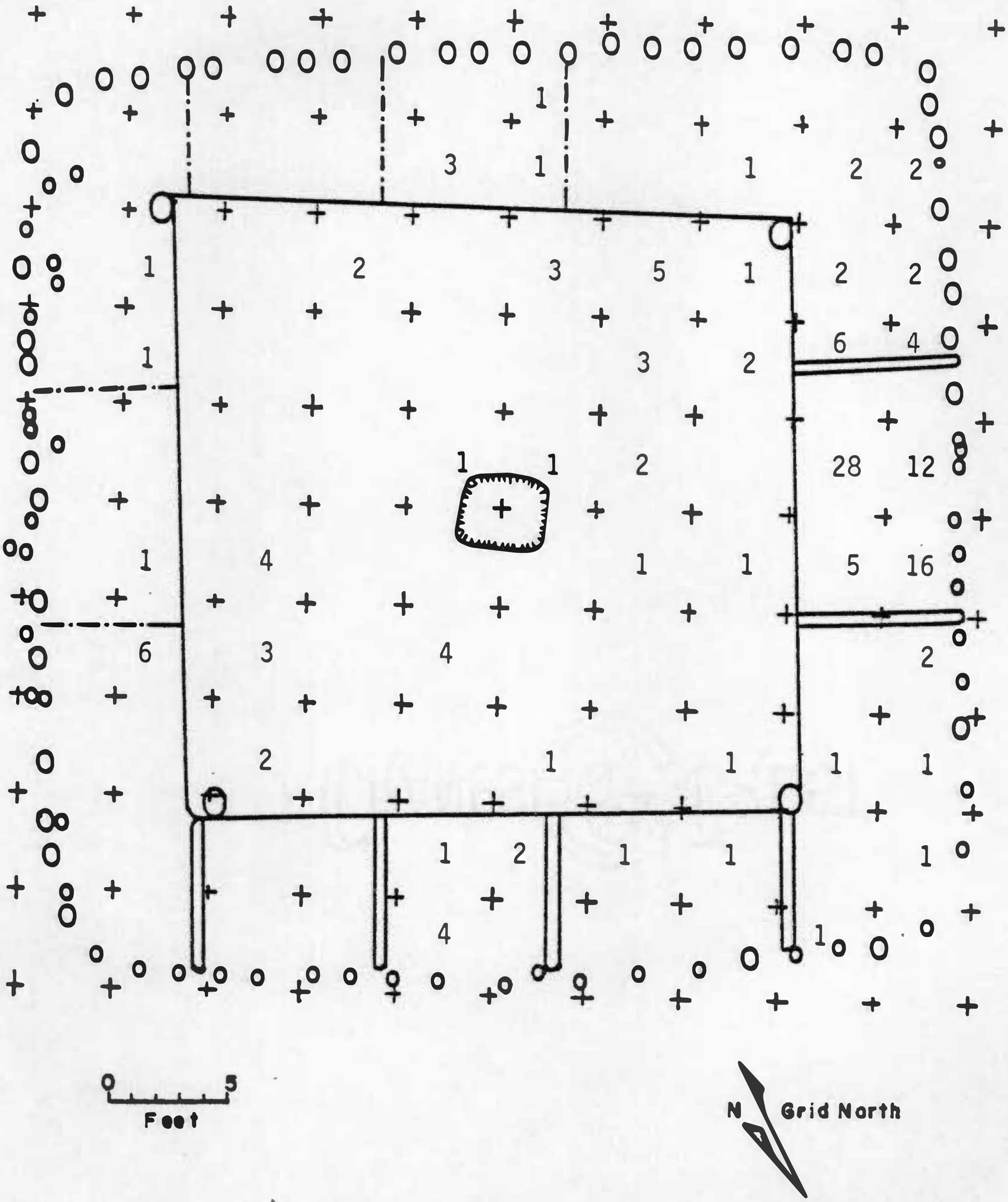

Figure 20. Structure 3: Distribution of All Sucker Remains.

Evidence that dogs were allowed in the structure is provided by the occurrence of dog-chewed elements in the faunal record (Figure 21). The dog-chewed/digested remains were found on the northeast corner and the area south of the hearth on the public floor. The greatest concentration of chewed remains occurred in the middle cubicle along the east wall. A few other chewed elements were scattered through the cubicles along the south wall. These modified pieces were absent from most of the northwest corner of the public floor area.

Bone artifacts and modified bone fragments were clustered in the southwest corner of the public floor, on the bench area of the south wall and in the center cubicle of the east wall and immediately adjacent public floor area.

Seventeen burials were found in the floor area of Structure 3, with most of the adult burials present in the bench areas along the south and west walls. None were found along the north wall. Eight burials had accoutrements: five had marine shell beads, one had pearl beads, two had worked bone items, one had two raccoon bacula and a swan wing fan, two had conch columella shell earpins, two had unmodified pocketbook valves, one had a conch fragment, one had an Olivella bead and one burial was accompanied by four valves of freshwater bivalves. Burial 91 was an adult male placed near the central hearth and was buried with an antler pin, worked indeterminate mammal bone fragment, two raccoon bacula, marine shell and pearl beads and elements from a swan wing, probably the remains of a swan wing fan. The burial associations are comparable to those from burials in structures of East Village Midden except for the pearl beads and the presence of the swan fan.

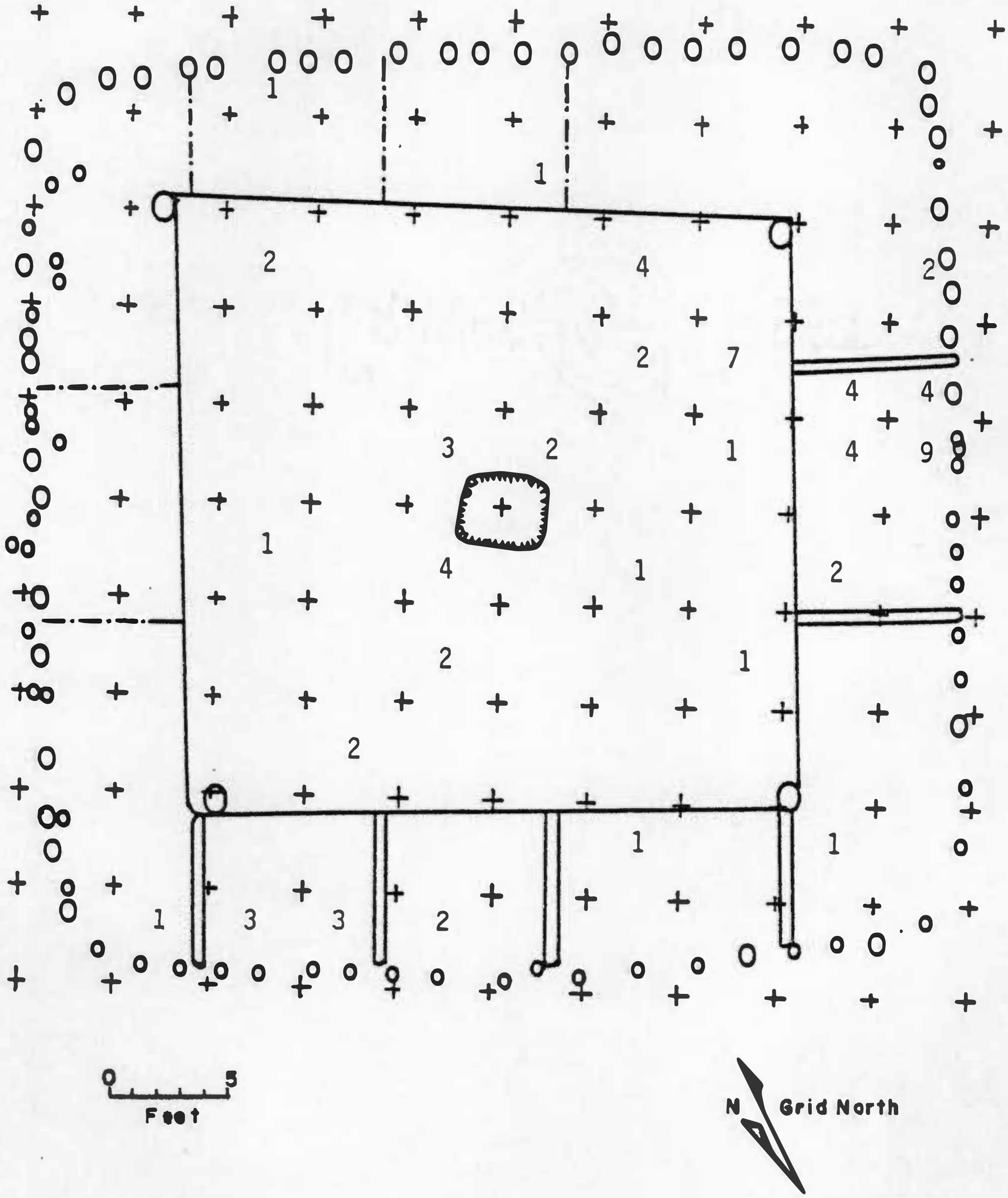

Figure 21. Structure 3: Distribution of Dog-chewed Elements.

The aquatic gastropods and freshwater bivalves as well as the majority of the vertebrate remains examined tended to be concentrated along the east wall, especially in the area (center cubicle) between the two clay partitions. This accumulation spilled off the bench area on to the public floor and northward into the northeast corner, decreasing in density westward toward the hearth. The northwest corner of the public floor from the bench area to the hearth was relatively devoid of faunal remains, as were the bench areas along the west and north walls. The distribution of land snails larger than about 5 mm indicates a relatively stable floor accumulation on the public floor area about 10 feet out from the hearth in all directions. The distribution of the freshwater bivalve, the mucket, was found scattered on the public floor area to the south and east of the hearth. Passenger pigeon and squirrel bones were found mainly on the public floor area in the northeast and southwest corners. Bear elements were restricted to the northeast and southeast corners and the middle cubicle on the east wall. Deer bones also tended to have a higher frequency along the front edge of the bench in the middle cubicle along the east wall and in the adjacent public floor area.

All of these individual patterns combined point to the use of the northeast corner of the public floor and the middle cubicle along the east wall as areas of refuse accumulation. These areas are followed by the secondary accumulation of refuse in the middle cubicle along the south wall. The area west and especially northwest of the distributions suggest activity around the hearth including the pitching of food remains to the south and east. This activity would create a semicircular pattern around the hearth. The smaller bones (as evidenced by bones of "smaller" animals: e.g. pigeon, squirrel, turtle, passerines) were dropped closer to the hearth than the larger heavier elements such as those of the bear and deer. Designation of the two central cubicles as areas of refuse accumulation may be strengthened by the observation on the location of the dog-chewed and/or digested bones. These elements were found in the eastern half of the public floor area and in the middle cubicle along the east wall. If this is the case, the red-tailed hawk and river otter may have been discarded before the structure burned.

That this structure served a special function as opposed to a purely domestic function is born out by several facts. Polhemus (1980, Pers. Comm.) noted the very large size, but nore importantly the high ratio of public floor area to private or bench area. The distribution of deer and bear elements from North Village Ares (i.e. Structure 3) pointed out the intermediate position of North Village between West Village and East Village Midden. This suggests a possible mixing of different status individuals. Also, the occurrence of river otter and raptor remains and the burial association of the swan wing fan all suggested status items point to the unique and important function of this structure.

Structure 4

Structure 4 was a partially excavated structure, immediately adjacent to Structure 2 in the East Village Midden Area. The door of the structure was in the south wall, facing southwest. No faunal material was recovered from the floor fill from this structure. The faunal materials recovered from a series of features within the structure were the faunal remains (Tables 11, 12, pp. 89, 91). There were two burials in the floor of Structure 4, one of which contained a pocketbook shell spoon with a notched handle.

Structure 9

Structure 9 was a 17.4 by 16.8 foot structure in West Village (Figure 3, pp. 30). The floor fill of this structure was removed as a single unit (Tables 11, 12, pp. 89, 91). Two burials were encountered in the structure, one of which contained a pocketbook spoon, an unmodified valve of the pocketbook and a shell fragment

Structure 13

This square 21.5 by 20.9 foot structure was the southern structure of the pair of structures on the west end of the summit of Mound A built during construction phases G and H. The building had a central prepared clay hearth and the door was located in the north wall. Little faunal material was recovered from the floor fill of the structure; most of the refuse occurred in the associated features (Tables 11, 12, pp. 89, 91). Two burials were associated with this structure, one which contained a plain marine shell gorget and two conch columella earpins. The other burial was accompanied by marine conch shell beads, one Marginella shell bead, a pocketbook spoon and a conch shell gorget exhibiting a Lick Creek rattlesnake motif.

Structure 14

Structure 14 was the southern structure that was comprised of a pair of buildings on the west end of Mound A, construction phase E (Figure 22). This structure burned, so most of the faunal material was burned and

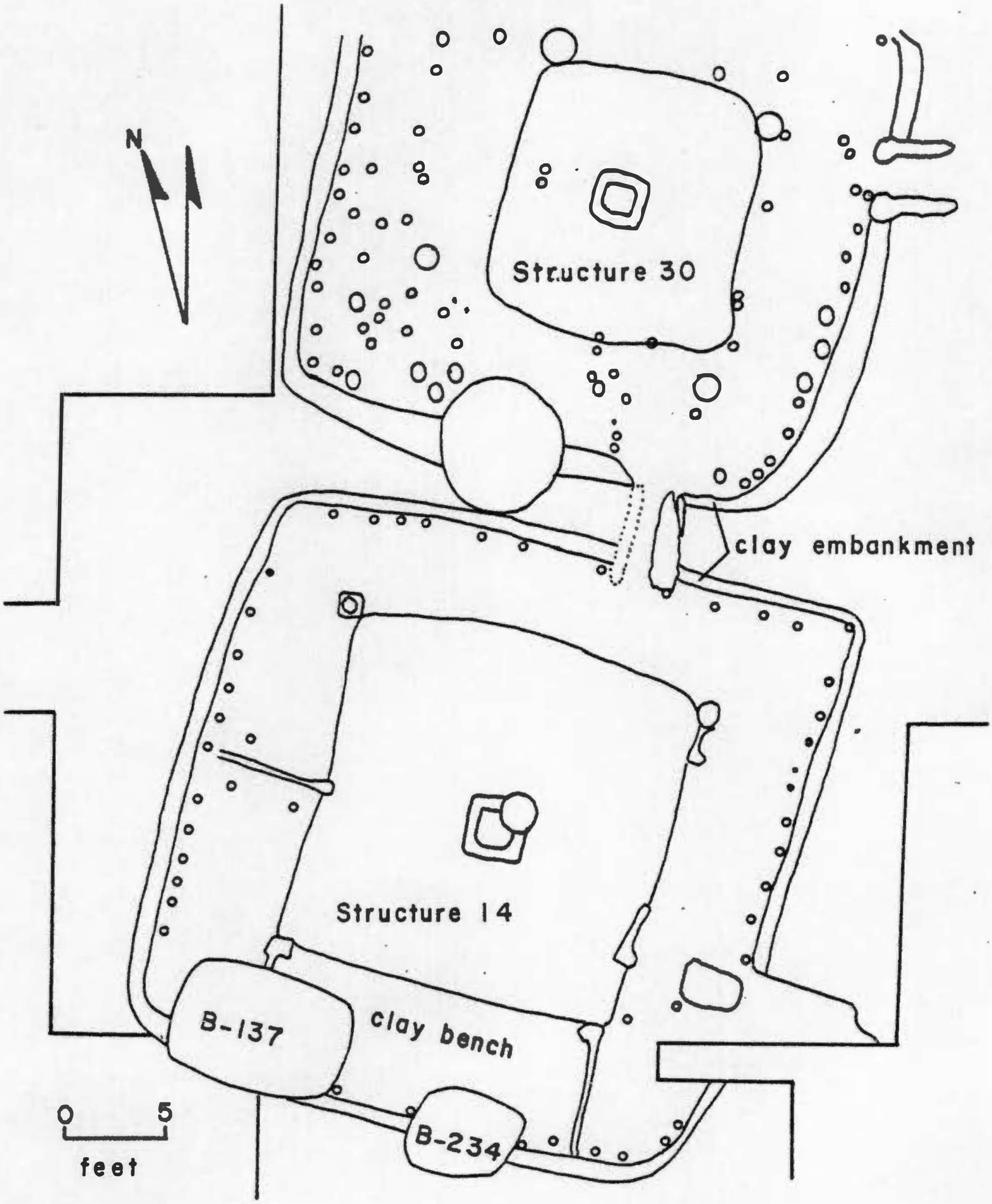

Figure 22. Floor Plan of Structure 14, Mound A.

fragmented. This nearly 30-foot square structure was excavated in five foot squares except for the five-foot wide east-west trench which transects the north edge of the structure. The structure had a central prepared clay hearth and four major internal roof support posts. The area between the support posts and the wall, at least along the south wall, was a prepared clay bench. There were no burials in the section of the floor that was directly associated with the structure.

The distribution of shell was concentrated in the southeast corner in the area east of the clay partition. Sixteen naiad valves were found on the bench area in the northwest corner. The remaining bivalves were scattered along the bench area. The few aquatic gastropods present were not concentrated, but found throughout the structure floor and bench areas. Four marine shell beads, eight fragments of Busycon columella and seven fragments of the whorl of a marine conch were found on the bench in the northwest corner of the building. Polhemus (1980, Pers. Comm.) considers this concentration of burned conch fragments and the associated tools to be a shell working location, evidence for shell modification at Toqua. However, these burned fragments are the only suggestion of conch shell working at Toqua. Nineteen marine shell beads and one marine shell disc were recovered from the area east of the clay partition in the southeast corner of Structure 14.

The vertebrate refuse was clustered in five small areas. The greatest concentration occurred in the southeast corner of the building, east of the clay partition that included two five foot squares to the north and west. Three other concentrations occurred on the clay benches, midway along the east and west walls and along the northwest corner of the north wall. The other small bone concentration was directly north of the prepared hearth. Two worked pieces of bone, a modified piece of mammal bone and a sharpened bone fragment, were recovered from the bench area in the northwest corner.

The distribution of faunal remains in Structure 14 corresponds quite closely to the pattern suggested in the introduction for distribution of faunal remains in a domestic structure. The majority of debris was concentrated in the southeast corner behind a clay partition, with several isolated concentrations on the bench area, probably close to the wall. The public floor area appeared relatively free of refuse except for the concentration north of the hearth. One door was located in the east wall and another in the north wall that connected Structure 14 with adjacent Structure 30. There was a refuse pile in the southeast corner and a concentration along the east wall, north of the door. The shell beads were found with 15 conch fragments and 2 bone artifacts in the northwest corner, suggesting that it was a work area. The other shell beads occurred in the refuse pile in the southeast corner. There was no evidence of dog-chewed or digested bones recovered from Structure 14.

<u>Structure 39b</u>

Structure 39b, approximately 21 feet square was located in the East Village Midden Area (Figure 23). This structure was characterized by four internal support posts, a central prepared clay hearth and the outer limits marked by a row of post molds. Three burials were excavated along the west and south walls. A possible entrance was located in the east wall. The structure was divided into four quarters and in each quarter the floor was excavated in two levels. Level 2, the

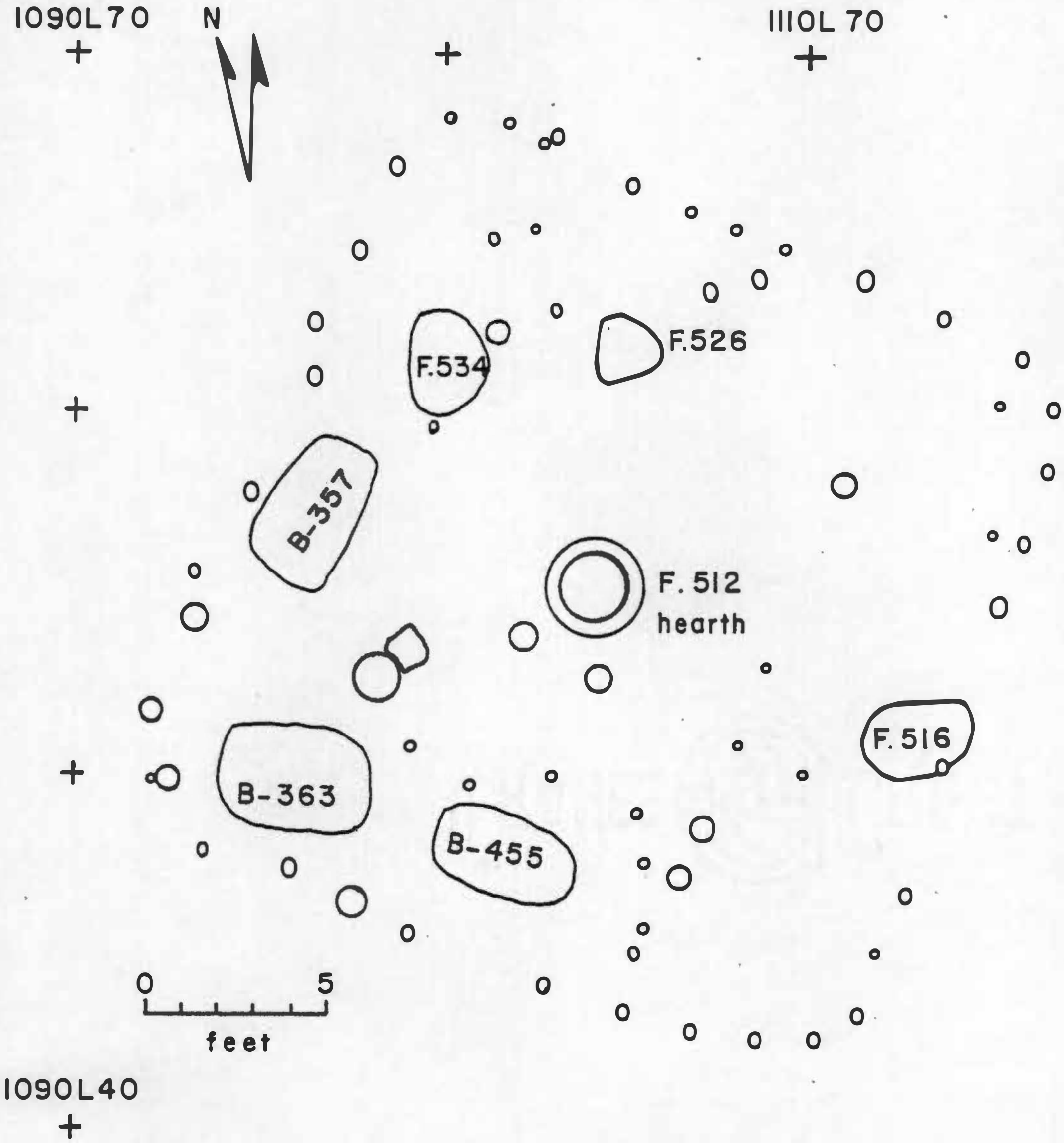

Figure 23. Floor Plan of Structure 39b, East Village Midden Area.

lower level, had less faunal materials than Level 1. Bones were concentrated in the northwest quarter of the structure. A 2 by 2 foot control block was completely excavated and fine-screened in the northwest quarter of the structure. The control block excavated in this quarter contained a large number of bird, turtle and fish bones, indicating that at least along the wall in the northwest corner, large amount of faunal debris had accumulated. The vertebrate remains were also concentrated in the southeast corner. The lowest concentrations of bones was in the northeast quarter. The bivalve and aquatic gastropods recovered from Level 2 follow a pattern similar to Level 1. The highest concentration of bivalves was in the northwest, followed by the southeast corner. The few aquatic gastropods were concentrated in the southeast corner.

The faunal sample from Level 1 of the floor deposit was larger than the sample from Level 2. Again, the vertebrate debris accumulation was concentrated in the northwest corner and the southeast corner. The northeast and southwest corners contained very little material, most of which were small pieces. The freshwater bivalves and gastropods from Level 1 were concentrated in the southeast corner and in the northwest corner, while the southwest corner has only 1 bivalve and 13 aquatic gastropods. The worked or modified bone and antler pieces were concentrated in the northwest corner in Level 2 and in the southeast corner in Level 1. Feature 526 contained 30 calcined fragments of a shed antler and Feature 534 contained 215 antler fragments from at least 8 major pieces, 1 beam fragment and 2 tines. This concentration of antler in the northwest quater would fit with the designation of the section as a work area. Dog-chewed or digested elements were found in the southeast (4), northwest

(4) and southwest (3) quarters of Level 2. The chewed bones in Level 1 were concentrated in the southeast quarter (4) followed by the southwest (2) and northwest (1). The dogs, although probably allowed in the structure, were restricted or at least their chewing activities were restricted to the northwest and southeast corners of the structure. Two of the burials (355, 363) were not accompanied by any bone or shell accoutrements. Burial 357 had seven freshwater naiad valves, a worked left beaver incisor and a worked piece of mammal bone.

The gross patterns which emerge from the distribution of the faunal debris correlate well with the expected accumulation patterns. The entrance area and probably the immediate hearth and public area were relatively free of faunal debris and the area with the three burials, the inferred sleeping area, was also relatively free of food remains. The northwest and southwest corners of the structure appear to have been the centers for work and/or storage. These two corners were the points of animal refuse accumulation and the two areas where bone tools were recovered. The pattern of faunal distribution between public, work, sleeping and entrance would probably have been much clearer if the floor deposit had been excavated in units smaller than 10 foot squares and if all of the deposit had been fine-screened.

The faunal samples from these two structures (14,39b) document a basic pattern for the location of refuse with in possible domestic structures, regardless of status. The northwest corner had an accumulation of faunal materials that was usually accompanied by bone tools and occasionally shell artifacts, thus suggesting a work area. The southeast corner had a large accumulation of debris just inside the door and, as in the case of the northwest corner, may even have been set aside for refuse collection. The bench area, the area between the structure wall and the major support posts, had localized concentrations of faunal materials while the central public floor area was clear of most faunal refuse.

Comparison of Structures

The utilization of shellfish as evidenced by the occurrence in the floor deposits and the features within the structure should reflect their relative importance to the occupants of that structure (Table 12, pp. 91). Structure 9 in West Village contained very few pelecypods or aquatic gastropods and the two structures on Mound A (13, 14) also exhibited very low numbers of aquatic gastropods. However, Structure 14 had a much larger quantity of bivalves on the floor than Structure 13 which was located on a later phase of mound construction. These two structures also had the largest number of marine shell beads. Structure 14 had a *Busycon* shell disc and 15 fragments of a marine conch on the floor. The only other conch pieces recovered included a disc from Structure 2 and a worked fragment from Structure 3.

The structures from East Village Midden (2, 4, 39b) had pelecypod concentrations of consideralbe size compared to those from the mound structures, although Structure had twice the species diversity. The naiad diversity from Structure 2 closely resembles that of Structure 14 while the species richness of Structure 4 and 39b are the same, the occurrence of two species found in both are considerably different. The incidence of *Fusconaia subrotunda* is very low in the Structure 4 sample, but makes up 24% of the Structure 39b pelecypod sample. *Dromus dromas* accounts for only 5% of the Structure 39b sample while it comprises 30%

of the Structure 4 sample. These differences probably reflect the habitat areas from which the inhabitants collected their bivalves.

The aquatic gastropods from the three structures in the East Village Midden Area again point to a larger number of species utilized by the occupants of Structure 39b and 2 than those in Structure 4. Structure 4 had the smallest sample of pleurocerids, but the sample was still dominated by the periwinkle (Pleurocera canaliculatum). These gastropods would have been available in the shallow riffle area and along the banks of the Little Tennessee River. Structure 3 contained six marine conch shell beads, one Marginella bead and one conch shell disc. No marine shell items were recovered from Structure 39b, only three beads from Structure 4 and eight pieces from Structure 2. The abscence of marine shell items from Structure 39b may be explained in terms of status differences between occupants of Structure 2 and Structure 39b. A similar explanation may be used for the distribution of the bivalves and gastropods.

The pelecypod sample from Structure 3 in the North Village Area corresponds in species richness to that from Structure 39b (Table 12, pp. 91). However, the species composition is markedly different. The number of Fusconaia subrotunda is considerably lower in the Structure 3 sample while there is a significant increase in two meaty species, the mucket (Actinonaias ligamentina) and the pocketbook (Lampsilis ovata). The mucket was probably a food item, while the pocketbook may represent animals collected not only for food but also for valves for manufacture of shell spoons. The aquatic gastropod sample from Structure 3 is four times larger than the next largest sample. Again the periwinkle dominated the sample. The large number of pleurocerids from this large structure may only be a reflection of the amount of activity carried on in Structure 3 and its much larger size in comparison with the domestic structures. The marine conch shell beads, worked piece of conch shell, cockle, and Marginella beads point to a closer relation to the structures on the mound or Structure 2.

Table 11 (pp. 89) summarizes the vertebrate faunal data for the seven structures discussed. The mammalian remains from Structure 9, West Village, include those of smaller animals such as squirrels and mice. Woodchuck and beaver are absent and only one element of raccoon was recovered from Structure 9. The mammalian refuse recovered from structures 13 and 14 was little more than a series of indeterminate mammal bone fragments. Deer elements, followed in number by squirrels, constituted the major food refuse. The frequency of mouse remains in structures 13 and 14 was low compared with the other structures. The three structures from East Village Midden compare closely in species diversity and relative frequency with the mammal remains recovered in Structure 14. The mammal bone sample from Structure 3 is dominated by the large quantity of small indeterminate mammal bone fragments, although the species richness found in the sample from Structure 3 is twice that of all other structures except Structure 9. The large size and the special function ascribed to Structure 3 may account for this species richness. The single possible bison element from a structure occurred in Structure 3.

Remains of avian species are not as evenly distributed among the seven structures as were the mammals. The only bird remains common to all seven structures were turkey, the main avian meat source. The bobwhite was represented in all of the structures except the two on the mound. Structure 9 contained elements of only the bobwhite, turkey and indeterminate passerines. Turkey remains occurred in Structure 14, while Structure 9 contained two passerine elements in addition to turkey. The three structures in East Village Midden Area all had elements of bobwhite and turkey and differ from the Mound A and West Village structures with regard to avian remains by containing bones of waterfowl. Structures 2 and 39b had three duck elements, Structure 4 a goose element. Both structures 4 and 39b had a passerine represented and Structure 4 contained one crow element. A single element of the sandhill crane occurred in Structure 39b. These three structures (2, 4, 39b) are similar to Structure 3 in that Structure 3 not only had waterfowl remains, but also contained bones of raptors, passenger pigeon and cardinal. The raptor and pigeon remains were absent from the domestic structures. The raptors played a major role in the iconography of the Southern Cult (Phillips and Brown 1978) and remains of these birds probably were held in high esteem. The passenger pigeon was found only in Structure 3 and in the midden from East Village Midden. The concentration of pigeon remains in Structure 3 suggests that passenger pigeon was a food reserved for high status individuals at the site.

Reptile remains at all localities except Structure 3 were dominated by fragments of the box turtle and they occurred in all structures. This restricted species diversity of turtle elements may be an indication of status dietary preferrence or possibly the result of variation in sample size. The three structures from East Village Midden Area and West Village were similar in that the reptile remains were dominated by the by the box turtle with some pond turtle and mud/musk turtle elements present. Remains of the softshell were absent from Structure 9. The sample from Structure 3 represents the whole spectrum of turtle species and is dominated by indeterminate turtle bone fragments as a result of the fragmented nature of the remains recovered in the floor deposits. The box turtle, with the exception of one fragment of the softhshell turtle, is the only species of turtle in the Structure 13 sample. Elements of these two, plus those of snapping turtle, were found in Structure 14. Snake vertebrae were present in all structures except Structure 14; only one element was recovered from Structure 13. This suggests that either the snakes were kept out of the structures on the mound or were not consumed by mound inhabitants.

Most of the amphibian remains can be considered as probably intrusive. The bullfrog and possibly the smaller ranids were consumed, but the toads, due to their burrowing activities, are likely intrusive. Remains of the hellbender, a large aquatic salamander, were found in structures 3, 9, 2 and 39b, but were absent from the mound structures. Bullfrogs and hellbenders apparently were not included in the high status diet.

Fish remains from the two structures on the mound consisted primarily of suckers. Structure 13 contained 35 sucker bones, 1 element of a channel/blue catfish and 11 elements of drum, while Structure 14 had 37 sucker elements, a single bone of gar and 4 of catfish. This distribution is opposed to the slightly wider variety of fish for West Village and East Village Midden. Catfish were not represented in Structure 9 except for a madtom element. Centrarchid remains were not recovered from structures 9, 13 and 14. Fish remains from all structures consisted primarily of suckers, but were accompanied by the remains of other fish species, including catfish, bass and drum.

Summary

The faunal samples from the seven structures, representing four major village areas, have provided an opportunity to examine the structure floor debris through consideration of several different aspects. These include the patterning of debris in a mound and a village domestic structure compared with a public or special function structure plus a comparison of structure content by village area. The patterns of faunal distribution for Structure 39b in the East Village Midden Area and Structure 14 from Mound A are very similar. The major midden or refuse accumulation was in the southeast corner. The projected sleeping area in the southwest corner or along the south and west walls was relatively free of faunal debris. A work area or secondary refuse accumulation was located in the northwest corner away from the door. The central public floor area was relatively clean; midden debris increased toward the southeast. Dogs were permitted in Structure 39b, but were apparently kept out of Structure 14, judging by the respective presence and absence of dog-chewed bones.

The internal patterning of these two domestic structures (14, 39b) can be contrasted with the patterns observed in the large public or special function structure (Structure 3) in North Village Area. The refuse in Structure 3 was concentrated along the east wall on a clay bench between two clay partitions, and had been deposited in lesser amounts in a cubicle along the south wall. The debris increased in density across the public floor area from the hearth to the bench areas. This debris was densest (highest frequency of elements) in the northeast corner and the lighest in the northwest corner. The distribution of muckets and land snails suggest a clear area around the hearth surrounded by a pitch and toss zone extending up to the edge of the bench and even on to the front of the bench. Dogs were allowed in the structure, as evidenced by dog-chewed bones found in the midden. This activity was centered in the partition along the east wall. The general pattern of refuse accumulation along the east wall, with burials along the south and west walls and secondary refuse accumulations in the southwest corner, seems to generally correspond to the pattern observed for the domestic structures, but only on a much larger scale.

The faunal sample from the floor and the associated features from each structure were combined and compared (Tables 11, 12, pp. 89, 91). The differential distribution of the waterfowl, raptors and passenger pigeon elements was observed only in North Village and East Village Midden areas. Turkey was the main avian food item in the mound structures. Waterfowl were absent from Structure 9 and present in the largest numbers in Structure 3. Box turtle elements were the most abundant of the turtle remains, while sucker elements dominated the fish asemblage recovered from the two mound structures. Deer and bear elements documented a selective distribution of cuts of meat, while a similar pattern has been suggested for beaver, raccoon and woodchuck. High status individuals would have had a choice of foods and it appears that the occupants at least on the mound selected turkey over other birds and that box turtles were used to the exclusion of pond turtles. Among the fish, several species of suckers appear to have been preferred. The limited distribution of waterfowl and passenger pigeon remains also indicated that these birds were probably redistributed or reserved for certain groups in the village.

Faunal remains from these structures provide another perspective on the utilization of animals and their distribution within the site. The patterns of food debris discard and refuse accumulation, the location of dog activities within structures and suggestions of redistribution of food items all provide a new light under which to examine other aspects of the cultural record (e.g. a comparison of the location of those animals associated with high status individuals and effigy vessels; test the patterns observed in the faunal record against the indications of status areas determined by a multivariate analysis of the Dallas burials and their associations).

Summary of Dallas Animal Resource Utilization

The faunal sample from the late prehistoric Dallas occupation consists of 75,887 vertebrate remains, 11,067 molluscan pieces and 14,162 burial associations (mostly shell beads). These remains were recovered from four village areas and two mounds. The large sample size and the diversity of cultural contexts from which the material were recovered have made it possible to reconstruct a pattern for late Mississippian faunal utilization and to test specific propositions concerning the visibility of a chiefdom level society in the archaeological record.

The overall pattern of vertebrate utilization in the Dallas diet corresponds to indications gleaned from other Mississippian sites (e.g. Adams 1950; Parmalee 1975; Robison 1977; Smith 1975). The major source of animal protein was the white-tailed deer, followed by the black bear and turkey. These major food species were variously supplemented by other vertebrates and freshwater bivalves and gastropods. This general diet, with a varying utilization of the molluscan resources, has remained relatively unchanged since probably late Paleo-Indian times (see Parmalee 1973; Weigel et al. 1974). However, the distribution of species and specific elements within the site indicates that this general picture does not totally reflect the Mississippian faunal sample from Toqua. Two of the archaeological correlates involving the patterning of faunal remains produced by a chiefdom level society state that there will be an uneven distribution of certain food remains within the site. The posited differential distribution of cuts of meat of the major food animals was confirmed by the unequal distribution of deer remains between areas of the site. The front leg of the white-tailed deer was found more commonly in the East Village Midden Area near the plaza, while in West Village behind Mound A the frequency of occurrence of the front leg was very low in contrast with the abundance of skull fragments and lower hind leg elements. This pattern is interpreted as preferential distribution of the front leg of the deer to higher status individuals while the culturally less desirable pieces (body sections with less meat) were consumed by lower status families. A similar pattern is suggested by the less numerous bear, raccoon and beaver remains. The proposition was also generated that some species would be restricted to either high or low status areas. Further examination of the faunal sample indicated several possible areas involving dietary preference or food use restrictions. The woodchuck was found only inthe East Village Midden, while waterfowl and passenger pigeon remains occurred only in East Village Midden and in the special function structure in North Village. The samples from structures on Mound A indicate either a preference for box turtles and an occasional softshell or snapping turtle or an aversion to the pond turtles whose remains were not encountered. These same deposits reflect a preference of suckers as opposed to most of the other fish species represented in the village refuse. The role of shellfish in the diet is not clear, but the remains were concentrated in North Village (aquatic gastropods) and in East Village Midden. All of these data confirm the unequal distribution of animal food resources within the site. Groups living around the plaza area in East Village Midden, those living on Mound A and those people using Structure 3 had access to the front leg of the deer as well as the haunch, utilized the bear and turkey and supplemented all of these with waterfowl. The high status individuals also had preferences for certain fish and turtles.

The role of certain animals, especially their skins and body parts, should have been restricted to specific status roles. These status animals were suggested as including raptors, mustelids and large birds such as cranes and swans. Distribution of the mustelid remains documents their special role in the Dallas culture. Elements of river otter were restricted to Structure 3 in North Village, while weasels and mink constituted mainly burial associations in Mound A and East Village Midden. Skunk elements from a prepared skin and the mink element were all from the East Village Midden Area. Four elements of a trumpter swan wing fan were associated with a burial near the hearth in Structure 3. The few raptor remains were primarily from Structure 3 and the East Village Midden Area, with the only raptor remains from Mound A being those of a screech owl. These birds, symbols of power and strength figured prominantly in the iconography of the Southern Cult and their remains probably carried the same significance. The association of a shandhill crane skull and a mink skin with a burial adds the crane to the list of animals which were probably symbolized high status and one that may also have been used for food. The occurrence of polished and incised bacula of raccoon and bear which have been interpreted as hunting amulets or charms, may serve as examples of the use of animal parts not restricted solely to high status individuals.

Status has been ascribed to burials based on the presence and quantity of various marine shell items. There appears to be a hierarchy of value from high to low status ascribed to the quantity of marine shell burial items present. The small marine conch shell beads, cockles, scotch bonnet and *Marginella* and *Olivella* shell beads were widely distributed among the village burials. The worked fragments, columella and conch pendants occurred in West Village, suggesting efforts by low status individuals in collecting even the smallest scraps of status materials. The gorgets, masks, cups and probably the large columella beads and ear pins were all status items. The least modified or small items of marine shell would have required the least imput of time and skill, thus constituting a lower cultural value (status value). The more labor and skill invested in a particular item (labor intensive items), the higher the value ascribed to that item and thus the higher the status value. For example, the unmodified scotch bonnet or small conch used as a pendant would have had far less status value than en engraved rattlesnake gorget. The inclusion of freshwater gastropods and bivalves with burials may have represented either food offerings or low status shell burial offerings.

The distribution of faunal debris on the floor of three structures was examined for patterns of refuse disposal and spacial distribution. Two structures (39b and 14) were domestic structures from the East Village Midden Area and Mound A, respectively. Refuse was concentrated in the southeast corner near the door, the area northeast of the hearth and the inferred sleeping benches were relatively free of refuse, while the northwest corner contained a smaller concentration of debris, containing some by-products of bone tool manufacturing, suggesting a work area. This area in Structure 14 had been suggested as a shell working area, based on the presence of the burned conch fragments and associated tools (Polheumus 1979, Pers. Comm.). The patterns observed in these two structures are very similar with the only differences between structures being in the species present or in the quantities of material.

The large public or special function structure in North Village (Structure 3) presented a unique opportunity to examine the distribution of refuse within a large building. This building was subdivided into a public floor area and the bench or private areas. The bench area was further subdivided by clay partitions. Refuse was concentrated along the east wall. The bench area which contained burials along the south and west walls was relatively free from debris as was the northwest corner of the public floor area around the hearth. The number of remains point to a pattern of disposal on the public floor area, beginning at the hearth and increasing in density and size of materials toward the edge of the bench along the east wall. The distribution of the small bone chips and elements of small animals in the area close to the hearth corresponds to a drop zone, while the larger elements, bivalves and debris would have been tossed over the shoulder and out of the way (Binford 1978b:345, 365, fig. 4, 16). The smaller pieces would have been dropped and become incorporated in the floor while the large pieces such as the large articular ends of bones and bone fragments would have thrown farther away from the activity area. This pitch zone would probably have been relatively stable and would correspond to the zone of terrestrial gastropod concentrations. The pattern of faunal distribution observed in Structure 3, although a large and special function structure corresponds relatively close to the patterns observed in the domestic structure.

The late Mississippian faunal sample discussed here illustrates that certain patterns do exist in the faunal record that can be used to test propostitons about the distribution of food items and the differential access to protein. The clarity of these patterns depends on the degree to which the local environment is able to support the population or the circumscription of those variables affecting local subsistence sufficiency (Peebles and Kus 1977:432). The more restricted the arable land and confinning the settlement pattern, the more regimented and structured the status hierarchy should become. As the hierarchy of statuses becomes tighter, the access to certain animal species and preferred cuts of meat will become more restricted and the patterns in the archaeological record will become sharper and more distinct. A trend in the patterning in the faunal remains should correspond to that which Goldstein (1976) suggests for the mortuary patterning taking place from farmstead to hamlet to secondary and major Mississippian sites. She sees a gradual increase in the complexity and sharpness of the patterning in the burial record.

Along a similar line, the development of such faunal patterning can be expected to occur along a gradient from Late Woodland through late Mississippian cultural periods. This would begin as a general egalitarian pattern of food resource utilization. The development of the

Mississippian period would be associated with the development of rank or stratification in the socio-political organization. The complexity of the social organization generally increased from early to late Mississippian. The patterns of differential access by high status individuals to food species, preferred cuts of meat, trade goods and other labor intensive items should become sharper and more well-defined through time along with the increasing social complexity. Development of these patterns should culminate in a form similar to those observed at Toqua.

CHAPTER III

THE OVERHILL CHEROKEE OCCUPATION AT TOQUA

Introduction

The densest area of historic Cherokee occupation occurred east of Mound A, beyond the major Dallas Village Midden (Schroedl and Polhemus 1977:12; Schroedl 1978:208). The Cherokee faunal sample was recovered from 68 features and a Cherokee midden (Zone B) on the north flank of Mound A (Figure 2, pp. 11). These features were identified as Cherokee based on the occurrence of Cherokee pottery, Euro-American items and remains of domestic animals. The Cherokee features and Zone B were tabulated separately to test for differences in refuse disposal or differences in species composition (Table 13). This large, well-preserved faunal sample provides important comparative data on the Colonial Period Overhill Cherokee subsistence strategy. The Toqua Cherokee data supplements the information from Chota (40MR2) and the Colonial Period materials (1746-1775: Newman 1977:8) from Citico (40MR7) (Bogan 1976; 1980). Chota was the center of Overhill Cherokee interaction with Euro-Americans and the faunal remains recovered there should be expected to reflect more direct Euro-American contact and interaction than other Overhill Cherokee towns. The Toqua sample faunal diversity should closely resemble that of the other two sites but, considering the lesser political roles of Citico and Toqua compared to that of Chota, the faunal samples from Toqua and Citico should also reflect a higher dependence on the native fauna and less dependence on introduced

Table 13: Summary of the Cherokee and Dallas Vertebrate Remains from Toqua.

Species	Cherokee Vertebrate Remains: Features				Zone B				Total Cherokee Bone				Dallas Vertebrate Remains: Total Dallas Bone				Plowzone and Disturbed		Total Toqua Vertebrate Sample
Mammals	Total	%	MNI	%	Total	%	MNI	%	Total	%	MNI	%	Total	%	MNI	%	Total	%	Total
Opossum, *Didelphis marsupialis*	2	T	1	1.01	1	.04	1	3.33	3	T	2	1.55	18	.03	6	1.92			21
Eastern mole, *Scalopus aquaticus*	3	T	2	2.02					3	T	2	1.55	5	.01	2	.64			8
Eastern cottontail, *Sylivilagus floridanus*	10	.03	2	2.02	2	.08	1	3.33	12	.03	3	2.32	58	.11	7	2.25	12	.27	82
Eastern Chipmunk, *Tamias striatus*													1	T	1	.32			1
Woodchuck, *Marmota monax*	6	.01	1	1.01					6	.01	1	.77	5	.01	2	.64	2	.04	13
cf. Woodchuck, *Marmota monax*					1	.04	1	3.33	1	T	1	.77							1
Gray Squirrel, *Sciurus carolinensis*	9	.02	2	2.02					9	.02	2	1.55	20	.04	3	.96	2	.04	31
cf. Gray Squirrel, *Sciurus carolinensis*					1	.04	1	3.33	1	T	1	.77	37	.07	7	2.25	2	.04	40
Fox Squirrel, *Sciurus niger*	1	T	1	1.01					1	T	1	.77	12	.02	4	1.28	1	.02	14
cf. Fox Squirrel, *Sciurus niger*													6	.01	3	.96	6	.13	12
Squirrel, *Sciurus* sp.	86	.26	6	6.06	6	.25	1	3.33	92	.26	7	5.42	294	.58	26	8.36	13	.29	399
Southern Flying Squirrel, *Glaucomys volans*													1	T	1	.32			1
Beaver, *Castor canadensis*	12	.03	2	2.02	2	.08	1	3.33	14	.03	3	2.32	43	.08	6	1.92	7	.15	64
cf. Beaver, *Castor canadensis*					1	.04	1	3.33	1	T	1	.77							1
Rice Rat, *Oryzomys palustris*	3	T	2	2.02					3	T	2	1.55	38	.07	7	2.25	4	.09	45
Mouse, *Peromyscus* sp.	1	T	1	1.01					1	T	1	.77	7	.01	3	.96			8
Hispid Cotton Rat, *Sigmodon hispidus*	1	T	1	1.01	1	.04	1	3.33	2	T	2	1.55	2	T	2	.64	1	.02	5
Eastern Woodrat, *Neotoma floridana*	1	T	1	1.01					1	T	1	.77	5	.01	4	1.28	1	.02	7
Vole, *Microtus* sp.	2	T	1	1.01					2	T	1	.77	3	T	3	.96			5
Pine Vole, *Pitymys pinetorum*	1	T	1	1.01					1	T	1	.77	2	T	1	.32			3
Muskrat, *Ondatra zibethica*																	1	.02	1
Mouse sp.	94	.28	11	11.11	12	.51	3	10.00	106	.30	14	10.85	627	1.25	56	18.00	29	.65	762
Dog, *Canis familiaris*					2	.08	1	3.33	2	T	1	.77	1	T	1	.32			3
cf. Dog, *Canis familiaris*	2	T	1	1.01	5	.21	1	3.33	7	.01	2	1.55	38	.07	5	1.60	11	.24	56
Gray Fox, *Urocyon cinereoargenteus*	10	.03	2	2.02	1	.04	1	3.33	11	.03	3	2.32	9	.01	3	.96	2	.04	22
Fox,	1	T	1	1.01					1	T	1	.77	3	T	2	.64			4
Bear, *Ursus americanus*	372	1.13	9	9.09	97	4.14	4	13.33	469	1.33	13	10.07	357	.71	22	7.07	110	2.47	936
cf. Bear, *Ursus americanus*	2	T	1	1.01					2	T	1	.77	5	.01	2	.64			7
Raccoon, *Procyon lotor*	16	.04	4	4.04	7	.29	3	10.00	23	.06	7	5.42	82	.16	13	4.18	12	.27	117
Mink, *Mustela vison*													1	T	1	.32			1
Striped Skunk, *Mephitus mephitus*	2	T	1	1.01					2	T	1	.77	3	T	1	.32			5
River Otter, *Lutra canadensis*													6	.01	2	.64			6
Cougar, *Felis concolor*	1	T	1	1.01					1	T	1	.77	12	.02	3	.96	3	.06	16
Bobcat, *Lynx rufus*	2	T	1	1.01					2	T	1	.77	9	.01	2	.64			11
Pig, *Sus scrofa*	48	.14	4	4.04					48	.13	4	3.10							48
Elk, *Cervus canadensis*					1	.04	1	3.33	1	T	1	.77	3	T	1	.32	6	.13	10
cf. Elk, *Cervus canadensis*	2	T	1	1.01					2	T	1	.77	5	.01	3	.96			7
White-tailed Deer, *Odocoileus virginianus*	1454	4.43	35	35.35	182	7.78	7	23.33	1636	4.66	42	32.55	3000	6.01	103	33.11	485	10.92	5121
cf. White-tailed Deer, *Odocoileus virginianus*													1	T	1	.32			1
cf. Bison, *Bison bison*					1	.04	1	3.33	1	T	1	.77					4	.09	5
Cow/Elk/Bison *Bos/Cervus/Bison*	33	.10	1	1.01					33	.09	1	.77	2	T	1	.32	1	.02	36
Cow/Bison *Bos/Bison*	5	.01	1	1.01					5	.01	1	.77	1	T	1	.32			6
Horse, *Equus caballus*	1	T	1	1.01					1	T	1	.77							1
Antler, Cervidae	164	.50	-		10	.42	-		174	.49	-		556	1.11	-		35	.78	765
Indeterminate Mammal Bone	30,408	92.83	-		2005	85.75	-		32,413	92.36	-		44,605	89.39	-		3688	83.10	80,706
Total Mammals	32,755	99.84	99	99.99	2338	99.91	30	99.95	35,093	99.82	129	99.84	49,883	99.82	311	99.87	4438	99.90	89,414
Birds																			
Pied-billed Grebe, *Podilymbus podiceps*	2	.10	1	2.63					2	.09	1	2.17	1	.02	1	1.03			3
cf. American Egret, *Casmerodius albus*																	1	.29	1
Canada Goose, *Branta canadensis*	1	.05	1	2.63					1	.04	1	2.17	6	.12	1	1.03			7
Goose, cf. *Branta* sp.													1	.02	1	1.03			1
Goose sp.	2	.10	1	2.63					2	.09	1	2.17	1	.02	1	1.03			3
Mallard/Black Duck, *Anas* sp.	2	.10	1	2.63					2	.09	1	2.17	5	.10	2	2.06	2	.59	9
Pintail/Gadwall Duck, *Anas* sp.													1	.02	1	1.03			1
Teal, *Anas* sp.	6	.30	2	5.26					6	.27	2	4.34	1	.02	1	1.03			7
Ringneck/Scaup Duck, *Aythya* sp.	3	.15	1	2.63					3	.13	1	2.17	2	.04	2	2.06			5
Merganser, *Mergus* sp.	1	.05	1	2.63					1	.04	1	2.17							1
Small Duck, Anatidae	1	.05	1	2.63					1	.04	1	2.17							1
Duck sp. Anatidae	14	.71	2	5.26					14	.63	2	4.34	9	.18	3	3.09	3	.89	26
Duck/Goose,	1	.05	1	2.63					1	.04	1	2.17							1
Turkey Vulture, *Cathartes aura*													1	.02	1	1.03			1
Coopers Hawk, *Accipiter cooperii*													3	.06	1	1.03			3
Red-tailed Hawk, *Buteo jamaicensis*	1	.05	1	2.63					1	.04	1	2.17	8	.16	2	2.06			9
Red-shouldered Hawk, *Buteo lineatus*													1	.02	1	1.03			1
cf. Red-shouldered Hawk, *Buteo lineatus*													1	.02	1	1.03			1
Sparrow Hawk, *Falco sparverius*	1	.05	1	2.63					1	.04	1	2.17							1
Hawk sp.	2	.10	1	2.63					2	.09	1	2.17	8	.16	1	1.03			10
Ruffed Grouse, *Bonasa umbellus*													3	.06	2	2.06			3
Bobwhite, *Colinus virginianus*	3	.15	1	2.63					3	.13	1	2.17	13	.26	3	3.09			16

Table 13 (Continued)

Species	Cherokee Vertebrate Remains: Features				Zone B				Total Cherokee Bone				Dallas Vertebrate Remains: Total Dallas Bone				Plowzone and Disturbed		Total Toqua Vertebrate Sample
Birds (continued)	Total	%	MNI	%	Total	%	MNI	%	Total	%	MNI	%	Total	%	MNI	%	Total	%	Total
Turkey, Meleagris gallopavo	74	3.76	8	21.05	23	9.05	3	37.50	97	4.36	11	23.91	376	7.57	34	35.05	32	9.58	505
cf. Turkey, Meleagris gallopavo					4	1.57	1	12.50	4	.18	1	2.17	28	.56	6	6.18	7	2.09	39
Chicken, Gallus gallus	29	1.47	3	7.89					29	1.30	3	6.52							29
Sandhill Crane, Grus canadensis													3	.06	2	2.06			3
cf. Sandhill Crane, Grus canadensis													4	.08	3	3.09			4
Virginia Rail, Rallus limicola													1	.02	1	1.03			1
cf. Greater Yellowlegs, Totanus melanoleucus	4	.20	2	5.26					4	.18	2	4.34							4
Small Sandpiper, Scolopacidae													1	.02	1	1.03			1
Passenger Pigeon, Ectopistes migratorius	39	1.98	3	7.89	12	4.72	2	25.00	51	2.29	5	10.86	99	1.99	14	14.43	14	4.19	164
cf. Passenger Pigeon, Ectopistes migratorius													4	.08	1	1.03	1	.29	5
Screech Owl, Otus asio													2	.04	1	1.03			2
Barred Owl, Strix varia													3	.06	1	1.03			3
Woodpecker, Picidae	4	.20	2	5.26					4	.18	2	4.34							4
Crow, Corvus brachyrhynchos	1	.05	1	2.63					1	.04	1	2.17	2	.04	1	1.03			3
Cardinal, Richmondena cardinalis													1	.02	1	1.03			1
Fringillidae	1	.05	1	2.63					1	.04	1	2.17							
Passerine sp.	10	.50	2	5.26	2	.78	2	25.00	12	.54	4	8.69	40	.80	6	6.18	1	.29	53
Indeterminate Bird Bone	1366	69.41	-		213	83.85	-		1579	71.06	-		4325	87.10	-		273	81.73	6177
Eggshell	400	20.32	-						400	18.00	-		11	.22	-				411
Total Birds	1968	99.95	38	99.95	254	99.97	8	100.00	2222	99.93	46	99.89	4965	99.96	97	99.95	334	99.94	7521
Reptiles																			
Snapping Turtle, Chelydra serpentina	19	.43	1	2.08	6	2.62	1	6.25	25	.54	2	3.12	27	.24	4	1.38			52
cf. Stinkpot, Sternotherus odoratus	9	.20	2	4.16					9	.19	2	3.12	24	.21	4	1.38	1	.21	34
Mud Turtle, ~~Kinosternon subrubrum~~													2	T	1	.34			2
Mud/Musk Turtle, Kinosternidae	16	.36	2	4.16	1	.43	1	6.25	17	.37	3	4.68	56	.50	6	2.07	3	.63	76
Eastern Box Turtle, Terrapene carolina	2008	46.12	36	75.00	146	63.75	10	62.50	2154	47.01	46	71.87	5529	49.73	249	86.15	340	72.49	8023
Map Turtle, Graptemys geographica	1	.02	1	2.08					1	.02	1	1.56							1
Map Turtle, Graptemys sp.													5	.04	3	1.03			5
cf. Map Turtle, cf. Graptemys sp.																	3	.63	3
Slider/Cooter Turtle, Chrysemys sp.	6	.13	1	2.08	1	.43	1	6.25	7	.15	2	3.12	6	.05	2	.69			13
Map/Slider Turtle, Graptemys/Chrysemys sp.	28	.64	2	4.16	3	1.31	1	6.25	31	.67	3	4.68	126	1.13	9	3.11	15	3.19	172
cf. Spiney Softshell Turtle, Trionyx spiniferus													1	T	1	.34			1
Softshell Turtle, Trionyx sp.	101	2.32	3	6.25	14	6.11	2	12.50	115	2.50	5	7.81	157	1.41	10	3.46	16	3.41	288
Turtle sp.	1785	41.00	-		52	22.70	-		1837	40.09	-		3914	35.20	-		78	16.63	5829
Nonpoisonous Snakes, Colubridae	213	4.89	-		5	2.18	-		218	4.75	-		743	6.68	-		4	.85	965
Poisonous Snakes, Viviparidae	56	1.28	-		1	.43	-		57	1.25	-		170	1.52	-		2	.42	229
Snake sp.	111	2.54	-						111	2.42	-		358	3.22	-		7	1.49	476
Total Reptiles	4353	99.93	48	99.97	229	99.96	16	100.00	4582	99.96	64	99.96	11,118	99.93	289	99.95	469	99.95	16,169
Amphibians																			
Hellbender, Cryptobranchus alleganiesis	6	5.82	1	4.54					6	5.55	1	3.84	27	5.73	5	9.43	9	69.23	42
Eastern Spadefoot, Scaphiopus holbrooki	32	31.06	6	27.27	1	20.00	1	25.00	33	30.55	7	26.92	118	25.05	16	30.18	1	7.69	152
Bullfrog, Rana catesbiana	1	.97	1	4.54					1	.92	1	3.84	12	2.54	3	5.66			13
Frog, Rana sp.	8	7.76	2	9.09	1	20.00	1	25.00	9	8.33	3	11.53	41	8.70	9	16.98			50
Toad, Bufo sp.	23	22.33	7	31.81	1	20.00	1	25.00	24	22.22	8	30.76	61	12.95	7	13.20	1	7.69	86
Frog/Toad, Rana/Bufo sp.	33	32.03	5	22.72	2	40.00	1	25.00	35	32.40	6	23.07	212	45.01	13	24.52	2	15.38	249
Total Amphibians	103	99.97	22	99.97	5	100.00	4	100.00	108	99.97	26	99.96	471	99.98	53	99.97	13	99.99	592
Fishes																			
Sturgeon, Acipenser sp.													2	.02	2	1.83			2
cf. Longnose Gar, Lepisosteus osseus													1	.01	1	.91			1
Gar, Lepisosteus sp	22	.55	2	3.57					22	.54	2	3.27	161	1.70	4	3.66			183
Pike, Esox sp.													3	.03	2	1.83			3
cf. River Chub, Nocomis micropogon	1	.02	1	1.78					1	.02	1	1.63							1
Minnow, Cyprinidae	1	.02	1	1.78					1	.02	1	1.63	7	.07	7	6.42			8
River Redhorse, Moxostoma carinatum	40	1.00	6	10.71	1	2.32	1	20.00	41	1.02	7	11.47	85	.89	11	10.09	3	2.08	129
cf. River Redhorse, Moxostoma carinatum													8	.08	4	3.66			8
cf. Shorthead Redhorse, Moxostoma macrolepidotum													1	.01	1	.91			1
Redhorse, Moxostoma sp.	174	4.38	13	23.21	5	11.62	1	20.00	179	4.46	14	22.95	207	2.19	16	14.67	7	4.86	393
Buffalo, Ictiobus sp.	3	.07	1	1.78					3	.07	1	1.63	1	.01	1	.91			4
Northern Hogsucker, Hypentelium nigricans	1	.02	1	1.78					1	.02	1	1.63							1
Sucker, Catostomidae	171	4.30	8	14.28	3	6.97	1	20.00	174	4.33	9	14.75	328	3.47	13	11.92	13	9.02	515
Channel Blue Catfish, Ictalurus sp.	20	.50	5	8.92					20	.49	5	8.19	13	.13	6	5.50	1	.69	34
Catfish/Bullhead, Ictalurus sp.													10	.10	5	4.58			10
Flathead Catfish, Pylodictis olivaris	2	.05	1	1.78					2	.04	1	1.63	4	.04	2	1.83			6
Madtom, Noturus sp.													1	.01	1	.91			1
Catfish, Ictaluridae	13	.32	3	5.35					13	.32	3	4.91	17	.17	4	3.66	1	.69	31
Sunfish, Lepomis sp.	1	.02	1	1.78					1	.02	1	1.63							1
Bass, Micropterus sp.	17	.42	2	3.57					17	.42	2	3.27	15	.15	4	3.66			32
Sunfish/Bass, Centrarchidae	9	.22	2	3.57					9	.22	2	3.27	8	.08	4	3.66			17
Sauger/Walleye, Stizostedion sp.	13	.32	3	5.35					13	.32	3	4.91	10	.10	3	2.75	1	.69	24
Freshwater Drum, Aplodinotus grunniens	58	1.46	6	10.71	7	16.27	2	40.00	65	1.62	8	13.11	318	3.36	18	16.51	15	10.41	398
Indeterminate Fish Bone	1820	45.85	-		27	62.79	-		1847	46.03	-		3252	34.41	-		87	60.41	5186
Fish Scales	1603	40.38	-						1603	39.95	-		4998	52.88	-		16	11.11	6617
Total Fish	3969	99.90	56	99.92	43	99.97	5	100.00	4012	99.91	61	99.88	9450	99.91	109	99.87	144	99.96	13,606
Grand Total	43,148		263		[illegible]		63		46,017		326		75,887		359		5398		127,302

domesticates, provided of course that political power and the ability to obtain domestic animals are correlated.

The mammal bones in the Toqua Cherokee sample comprise 76.26% of the total, followed in decreasing order by reptiles (9.95%), fish (8.71%), birds (4.82%) and amphibians (0.23%). These percentages, based on the number of bones, reflect the relative dietary importance of the five vertebrate classes. The minimum number of individuals (MNI) was tabulated for each species for features and Zone B separately.

Fish

Fish remains representing 61 individuals, comprised 8.71% of the Cherokee sample. Numerous fish scales (1603) were recovered from the features but none were recovered in the Zone B sample. Only five fish individuals were identified in Zone B: three were suckers and two were drum. Approximately, half of the fish MNI were suckers while the other half of the MNI was dominated by the freshwater drum (13.11%). All fish species identified in the faunal sample would have inhabited the Little Tennessee River. Gar, sunfish and bass would have been available in local ponds, sloughs and backwaters. The suckers would have been available in deep pools but could have been easily taken in quantity during their spring spawning run in tributary creeks. These fish could have been caught by hook, nets or in weirs.

Fish represent only 18.7% of the total MNI; this aquatic food resource probably provided a seasonal supplement to the Cherokee diet. Rostlund (1952:3-6) noted fish contribute a unique compliment of minerals, vitamins, iodine and protein and are the most nutritious during the spawning run in the spring, when the suckers were possibly collected.

Amphibians

Amphibian remains represent only 0.4% of the total faunal assemblage. Remains of frogs, spadefoot toads and toads are often considered intrusive in faunal samples, especially the eastern spadefoot toad due to its burrowning habits. The bullfrog and the hellbender (a large aquatic salamander) can be considered potential food items. Amphibians would have probably only provided a minor seasonal dietary supplement if used at all. Hellbenders could be collected by hand or caught in fish drives and weirs in the Little Tennessee River.

Reptiles

Reptile remains were the second most common group of elements present in the Toqua Cherokee faunal sample (9.95%). Snake remains consisting primarily of isolated vertebrae represented individuals from two families (the nonpoisonous snakes, Colubridae and the posionous snakes, Crotalidae); a general "snake species" category included broken vertebrae, ribs and post-caudal vertebrae. The number of isolated vertebrae precluded any attempt at determining MNI for snakes. Ethnographically, the snake played a major role in the Cherokee mythology and was included in some sacred formulas (Mooney and Olbrechts 1932:76). Considering the snakes' role in mythology and the Cherokee fear of them, the snake probably was not included in the Cherokee diet (Mooney 1900:294).

Turtles, however, figured as an important dietary supplement and their shells frequently were made into rattles. Six species of turtles were utilized with box turtles accounting for 71% of the individuals. Box turtles could have been collected in the fields and forest around the site. The snapping turtles, softshell turtles, sliders, painted and mud/ musk turtles supplemented the box turtle in number but probably supplied a similar amount of meat. The aquatic turtles could have been collected from ponds, slough, pools or in fish weirs in the Little Tennessee River.

Birds

Avian remains represented 4.82% of the total sample, with only 12% of the bird bones being identifiable. The sample of bird bones from Zone B (Cherokee midden) contained only turkey, passenger pigeon and passerines, compared with the greater species diversity found in the Cherokee features. Also, bird eggshell was identified from only the Cherokee features.

The pied-billed grebe and waterfowl probably were taken and eaten whenever they were available. However, since east Tennessee is not within one of the major waterfowl flyways, most species of ducks and geese were only seasonally available during migration and then were never very abundant.

Raptorial birds were represented by only three individuals, a sparrow hawk, red-tailed hawk and an indeterminate species of hawk. The Cherokee considered all raptorial and nocturnal birds as unclean and were adverse to eating them because they would be subject to blood revenge of their victims (Williams 1930:137; Gilbert 1943:346). Hawks played only a minor role in Cherokee mythology (Witthoft 1946b:375; Mooney 1891:356). Considering the Cherokee aversion to raptors, hawks were probably not eaten but rather the feathers or body parts were used in some social or symbolic activity.

The turkey was the most important bird in the Cherokee diet at Toqua, and its remains represented 23% of the avian sample. The fact that the turkey supplied a major meat item in the Cherokee diet has been documented from most historic and late prehistoric groups in Eastern North America (Bogan 1976; Guilday et al. 1962). The turkey also supplied bones for awls and feathers which were used in the making of elaborate cloaks (Swanton 1946).

Four elements of a shore bird that compare favorably with the greater yellowlegs were recovered. The normally solitary habits, occasional occurrence in east Tennessee and the relatively small size of the greater yellowlegs all argue against this bird as being of any value as a food species. No mention of the greater yellowlegs is made in the Cherokee ethnographic literature. However, other members of the family of shore birds (sandpipers, woodcock, snipes) and the family of plovers and killdeer are recognized and mentioned in Cherokee medicinal lore (Mooney and Olbrecht 1932:44; Witthoft 1946b:378). The shore birds and plover spirits either caused illnesses or were called upon to help to cure a patient of worms or other stomach trouble (Mooney and Olbrecht 1932:44-46, 48-49, 214-215, 249; Witthoft 1946b:378). The remains of the greater yellowlegs may represent a bird that had been used for medicinal purposes.

The domestic chicken was accepted by the Cherokee sometime after 1740 (Gilbert 1943:360) and appears to have functioned in a role similar to that of the turkey (Bogan 1976:76). Only 29 elements of domestic chicken, representing three individuals, were identified. No chicken remains were recovered from Zone B (Table 13).

Fifty-one elements of passenger pigeon representing only five individuals accounted for 10.86% of the birds. The low frequency of passenger pigeon remains in Cherokee faunal samples has been attributed to either the taking of squabs (the friability and lack of calcification of the immature bird bones resulting in poor preservation) or that the passenger pigeon played a very minor role in the Cherokee diet (Bogan 1976:77).

Woodpeckers, crows, fringlids and various other passerines were probably collected not only for food, but for their feathers. The woodpeckers appeared in Cherokee myths and the Cherokee relished small passerines as food (Witthoft 1946b:373, 380).

Mammals

Mammal remains comprise 76% of the total Cherokee faunal assemblage, although only 7.6% of the bones could be identified beyond class. Moles may be considered intrusive due to their fossorial habits and also the Cherokee's strong aversion to them (Williams 1930:139). Mice and native rats would have lived around Cherokee structures and represent accidental inclusions in the faunal record rather than remains of dietary items. The majority of these animals' remains occur in features (pits) where they might have been trapped and died. Zone B contained only one cotton rat element. The lack of rodent remains in Zone B and their inclusion in the Cherokee features supports the argument for their accidental inclusion in the faunal record.

The opossum, rabbit, squirrel, beaver and woodchuck all served as supplemental food items and the skins of these animals would have been used; for example, the opossum skin was dyed and used as a hat (Grant 1925:156). The smaller animals such as the rabbits and squirrels were probably hunted by children with the blowgun (Williams 1948:71-72).

The muskrat is absent from the Cherokee faunal samples from Toqua (Table 13, pp. 143), Chota (Bogan 1976:55) and Citico (Bogan 1980). This is an interesting omission since the animal was commonly utilized by other historic groups (Guilday et al. 1962). Historically, the muskrat was probably a common inhabitant in the Little Tennessee River Valley (T.V.A. 1972:II-12-1). No reference to muskrats occurs in the literature on Cherokee mythology and medicine. This semi-aquatic mammal would have been observed by people atuned to the environment as were the Cherokee, but for some reason they did not utilize the muskrat, or if they did, the bones were not recovered.

The canids were represented at Toqua by the gray fox and the domestic dog. The fox would have been taken for its fur, but probably not eaten (Gilbert 1943:346; Williams 1930:139). The dog was a common resident in Cherokee villages. The only domestic dog remains from the Cherokee occupation at Toqua were recovered from Zone B (Dog Burial #4). The animal was only partially articulated and somewhat scattered. Skull measurements for Dog Burial #4 from Toqua compared favorably with other historic dogs (Parmalee and Bogan 1978:108-109).

Prehistorically the raccoon was an important food source in the eastern United States (Guilday et al. 1962; Parmalee 1965). Bogan (1976: 79; 1980) noted that the raccoon played only a minor role in the diet at Chota and Citico and only seven individuals were recorded for the Toqua Cherokee sample.

Adair observed that the Cherokee considered the striped skunk, cougar and the bobcat all unclean and polluted food (Williams 1930:139), although the skins of these animals were used. The skunk seems to be an exception to the distain the Cherokee had for carnivores. They used the skin, scent gland, meat and oil of the striped skunk when trying to cure smallpox and to ward off contagious diseases (Mooney 1900:265-266). The cats would not have contributed to the diet and the skunk would probably have been eaten only under special circumstances.

Many American Indian tribes viewed the bear with respect and ceremoniously killed, skinned and butchered it. The bear remains were carefully disposed of so that dogs would not eat them (Hallowell 1926). However, there is no tangible evidence for a special treatment of the bear in the Cherokee faunal record. All elements appear in the midden and some are dog-chewed. The bear contributed skins for the fur trade or personal use, food, oil and bones (DeVorsey 1971:110). Guilday et al. (1962:66) observed a pattern in the historic faunal assemblages that suggested a greater use of them in the historic than in the prehistoric period. Feature 3, a large Cherokee refuse pit contained 77 metapodials and 69 phalanges that represented five front and six hind feet. This concentration of elements representing paws documents the ethnographically recorded comment that bear paws were considered a delicacy (Hudson 1976:279).

Philippe (1977:201) observed the uses of some mammals, or their representations, during his short visit to Toqua in 1797. He mentions smoking and comments that the pipes

> . . . are carved to represent all imaginable indecencies. They furnished me with one on which is a bear and a wolf (Sturtevant 1978:201).

Louis Philippe also bought a tobacco pouch made from a mink skin decorated with red-dyed horse hair; the latter was also sometimes used to decorate their hair brads (Sturtevant 1978:201). These observations help to further illustrate the varied use of animal skins, parts of animals and their representation throughout Cherokee culture.

White-tailed deer elements comprised 61.04% of the identifiable mammal bones and 32.5% of the mammalian MNI. The deer provided the meat staple for the historic Cherokee and most historic groups in the East. All parts of the deer carcass were used: meat, skin, blood, brains, marrow, bones for tools, antler, sinew and hooves. The importance of the deer in the everyday life of the Cherokee was reflected in the Cherokee mythology and their concept of disease (Mooney 1900:250-252; Monney and Olbrecht 1932:44-50). Antler was used for handles, projectile points and gaming pieces. Deer bones were used to manufacture awls and tubes (Bogan 1976:114).

The domestic hog was represented in the Cherokee features by four individuals. The hog was introduced into the historic Cherokee area sometime during the first half of the eighteenth century and, by the 1760s, it was being raised by the Cherokee for sale (Newman 1979:102; Williams 1948:72). Bogan (1976:87) reported 162 hog elements from Chota, representing eight individuals; 14 elements representing two individuals were reported from Citico (Bogan 1980).

The elk, bison, cow and horse probably provided only an occasional supplement to the meat diet. The elk was apparently uncommon in east Tennessee in early historic times and was quickly extirpated after the introduction of firearms. Only one horse element was recovered at Toqua. Bogan (1976:87; 1980) noted the horse remains recovered from Chota and Citico may have represented animals which had been eaten. The Cherokee felt the horse was unclean and eaten only during times of extreme distress (Williams 1948:66-67, 72). The cow and bison remains involve a problem in identification because these two animals are extremely similar osteologically and bones in fragmented or eroded condition should be combined together as cow/bison (Olsen 1969). Aboriginally bison inhabited east Tennessee, while domestic cattle were introduced among the Cherokee by at least the 1760s (Newman 1979:102; Rostlund 1960). During the last third of the eighteenth century elk and bison had almost been extirpated and the deer population was greatly reduced due to heavy hunting pressure as a result of the fur trade. This rapid decline in the native fauna forced the acceptance of European domesticates by the Cherokee, replacing the native animals in the diet.

Butchering Patterns

The processing of a food animal consists of several activities: skinning, dismemberment, removal of muscle masses and breaking bone for marrow. These patterns may be preserved in the archaeological record in the form of cut marks on bone and broken and fractured elements. The recognition of the processing patterns in the faunal record was first emphasized by the work of White (1953) and further elaborated by Wheat (1972). Guilday et al. (1962) carefully examined the faunal remains from the historic Eschleman site and described butchering patterns reconstructed from the location and frequency of cut marks on identified elements. They present two criteria for marks to qualify as butchering marks.

> (1) Repetition in specimen after specimen at precisely the same location on the bone; (2) there was some anatomically dictated reason why a particular mark should occur at any given spot (Guilday et al. 1962:62).

The difference between the butchering and skinning marks differ mainly in position. Skinning cuts occur in positions where the skin is very close to the bone, e.g. on the skull, lower jaw, metacarpals and metatarsals (Guilday et al. 1962:63).

The identifiable animal remains recovered from the Cherokee occupation at Toqua show evidence of being chopped, scored or cut. Score or cut marks on bones are typically fine grooves on the bone, while chop marks are large indentations or fractures resulting from the use of a large knife, hatchet or axe. The location of these marks, if recurring, can be interpreted as the pattern by which the Cherokee skinned, dismembered or partitioned their different food animals. A total of 114 pieces of bone representing nine animals exhibited chopping, butchering or skinning marks. The most frequently scored bones were from white-tailed deer with 79 cut pieces. Three deer frontals showed evidence of the antler having been chopped off at the pedicle. A lower jaw was cut on the ramus. One jaw was marked by a cut on the medial side, and one hyoid was cut. A scapula was notched on the posterior margin and on the ventral side of the blade. Four distal humeri exhibited cuts on the anterior margin, five distal humeri were cut on the medial margin and two distal humeri exhibited cuts on the posterior margins. The proximal radii sustained cuts on the medial anterior and posterior sides. One ulna was cut across the semi-lunar notch. Three carpals were cut across their lateral margins. Four ribs were cut: two on the medial side, one on the lateral side and one just below the head. Four cuts occur along the ilium and one on the ischium. One cut was found on the proximal end of a femur under the head, and one cut mark was observed on the proximal lateral tibia. Two distal tibia were cut on the anterior side. The astragali were cut only three times on the lateral side, but were scored 15 times anteriorly and 25 times medially while the calcaneum was cut twice on the dorsal surface and once each medially and laterally. One proximal metatarsal was cut along the medial side.

The position of the butchering marks can be used to construct a pattern for the dismemberment of the white-tailed deer by the Cherokee inhabitants at Toqua. The marks on the jaw indicate either the removal of the skin from the lower jaw or removal of the lower jaw. The case for removal of the lower jaw and tongue is strengthened by the evidence of cut marks on the hyoid. The front leg could be removed from the carcass without leaving any butchering marks. The marks on the scapula were probably inflicted while removing the associated muscle mass. The scapula and the rest of the leg could be easily separated without leaving any marks. However, the elbow joint would have been more difficult to separate, this is evidenced by the numerous cut marks on the distal humeri and proximal ulna. The cuts on the radii probably resulted from meat removal since they are on the shaft of the bone instead of at the extreme proximal end.

Finally, the lower leg including the metacrapals and toes was removed as suggested by the cuts on the carpals. The position of the cuts on the ribs indicate that they were removed from the vertebral column while partitioning the rib cage. Apparently the meat was removed from the pelvis, resulting in the cuts on the ischium and ilium. The cut on the proximal femur can be interpreted as having been inflicted either during disarticulation of the hind leg from the pelvis or removal of the meat from around the proximal end of the femur. The "knee" joint could have been disarticulated without leaving any evidence of the butchering procedure. However, a cut proximal tibia documents one instance of disarticulation of the hind leg at the knee. The hock or "ankle joint" was probably the most difficult joint to separate. This joint is tightly secured by interlocking bones and a series of tendons running from the distal tibia down across the astragalus and tarsals to the metatarsal. This joint may be disarticulated by severing the tendons on the medial side of the astragalus. Tis is the exact location of the majority of the cuts on the astragalus. The cuts on the calcaneum probably represent attempts to cut tendons attached to the calcaneum. The cut on the metatarsal may represent a skinning mark since there is almost no meat on the bone.

Twelve bear elements show evidence of butchering. All cut marks occur in positions similar to those described for the deer. The lower jaw was both chopped medially and laterally on the ramus. Two cuts were found on the shaft of the humerus. A proximal radius was scored as were three ulnas, one cut occurring in the semilunar notch. A single cut was noted on a distal radius and one distal femur was cut posteriorly. Two cuts were located on the dorsal surface of an ischium.

The butchering pattern which may be constructed for the bear follows that described for the deer. The lower jaw and tongue were removed. The marks on the shaft of the humerus probably resulted during the removal of the muscle mass. The scoring of the proximal radius and ulna would have occurred during the separation of the humerus from the lower forelimb. The cut distal radius suggests the removal of the paws. The femur was scored during the removal of meat rather than during the disarticualtion of the "knee" joint. The marks on the ischium provide evidence for the removal of meat from the rump.

Elements of elk, cow/elk/bison, cf. dog, bobcat and gray fox also exhibited cut marks. A bobcat mandible was cut along the ventral margins of the horizontal ramus, probably during removal of the skin from the skull. A gray fox frontal and a left jaw were cut, suggesting removal of the skin from the skull.

Only two chicken elements, a femur and a radius, show evidence of butchering. The femur was cut just under the head while removing the leg, and the radius was cut on the proximal end, probably while removing the outer wing.

The technique used to prepare turtles is suggested from the occurrence of three cut turtle elements. A fragment of a softshell turtle plastron was chopped, probably near the bridge, to remove the plastron. Removal of the plastron would expose the whole animal which was then easily removed from the shell. One softshell turtle corcoid was cut on the shaft. Such a cut would have been made while removing meat from the shoulder girdle. An indeterminate turtle long bone was cut on the shaft while stripping the meat from the leg. The paucity of butchered turtle elements may be explained in two ways. Once the turtle was removed from its shell the limbs may not have been disarticulated before cooking. Also, lack of scored bones may be the result of the loosely articulated joints that could be easily separated by pulling them apart rather than separating them by cutting.

Interestingly, two sucker elements showed evidence of butchering efforts. One redhorse hyal exhibited a single chop mark while a river redhorse maxilla had been chopped several times. This evidence illustrates the butchering and probably cooking of fish heads, since the cuts were probably inflicted while splitting the skulls to remove the gills before cooking. The two cut redhorse skull elements are the first evidence from Colonial Period (1746-1775) faunal samples for the processing of fish skulls. The only other evidence is a chopped redhorse operculum from the Federal Period (1794-1819) deposits from Citico (Bogan 1980).

Combining the evidence for skinning and butchering patterns from the faunal samples from Toqua, Chota (Bogan 1976:99-105) and Citico (Bogan 1980) provides a good indication of the methods used by the historic Cherokee to skin and process food animals. The Cherokee processing patterns can them be contrasted with the late prehistoric Dallas skinning and butchering patterns.

The butchering and skinning cuts on deer bones described from the Cherokee faunal sample at Toqua correspond very closely to the pattern for deer butchered at Chota. The treatment of the axial skeletons including the rib cage are the same: the lower jaw and hyoids were cut, removing the jaw from the skull, and the pelvis was broken during removal of the meat. The rib cage appears to have been removed as a single unit. The front leg was cut into several segments, disarticulation taking place at the shoulder and elbow joints. One carpal in the Toqua sample was cut either during skinning or removal of the lower leg. The hind leg dismemberment was identical for both samples. It is interesting to note that in both Cherokee samples, no cut marks were observed on the distal femur and only one mark on a proximal tibia. This joint could easily be separated without scoring the two elements. Bear and other mammal bones which showed cut marks occurred in anatomical positions similar to those discussed for the deer from Chota and Toqua. The few cut elements from Citico have marks which correspond to those described either for the Toqua or Chota sample (Bogan 1980).

The Colonial Period Overhill Cherokee butchering patterns can be reconstructed from the patterns documented in the Toqua, Chota and Citico faunal samples. The pattern of severing the tendons and disarticulating the animal seems to hold in the three samples examined. However, by the

Federal Period, although the animals were still being butchered into similar units, there is a change in the kind of marks. The Colonial Period butchering evidence consists of cuts and scorings on the bone. Many of the Federal Period remains from Citico are chopped, as was the case of a horse metacarpal that had been chopped in half. There appears to have been a continuation of the same pattern of carcass partitioning, but with a shift from cutting to hacking and chopping (Bogan 1980). No evidence was encountered for the Cherokee use of meat saws.

Cherokee Bone Artifacts

Bone and antler artifacts were recovered from the historic Cherokee midden (Zone B on Mound A) and from the historic Cherokee features. Eight modified pieces of bone and antler were recorded from Zone B and 33 from the Cherokee features. One white-tailed deer ulna had the distal end ground to a point, probably for use as an awl. Cervid antler was used to manufacture two "pins", 35 and 30 mm long with respective diameters of 9.2 and 8.8 mm. Two antler fragments were cut and ground, one ground to a point, the other removed from the rest of the tine by the groove and snap method. Two additional antler tines were cut and modified. One bear baculum had both ends removed.

The box turtle carapace was modified in some instances for use as bowls, but probably more importantly the shell was made into rattles. One box turtle carapace fragment and one fragmented carapace were smoothed and ground, suggesting they were formerly part of a bowl. Four box turtle shell pieces were drilled: one carapace fragment, one hypoplastron and two posterior halves of a plastron. The two posterior halves of plastrons were drilled anteriorly at the midline.

Indeterminate mammal and bird bones were used as raw materials for the manufacture of tools and other artifacts. Two indeterminate bird and four indeterminate mammal bones showed evidence of work or modification. Two mammal bones were shaped into beads (29 and 17 mm long). The ends of three mammal bone fragments were modified and may be considered splinter awls. These three artifacts were 59, 76 and 80 mm long. One small, smoothed flat mammal bone piece was encountered which may represent a gaming piece; this piece was 31 mm long and 8.4 mm wide. Although, this small item does not correspond to the bone "buttons" reported by Bogan (1976), it may represent a local variation in the gaming pieces used in the button game.

Bone items which could be directly associated with European contact included two drilled round indeterminate mammal bone buttons, European bone combs and bone knife handles. Three bone knife handle fragments were recovered, two of these fragments had small holes drilled through, one still contained an iron pin. The European bone combs were represented by six fragments, all with some teeth missing, and three other bone fragments which may represent comb fragments.

This assemblage of bone artifacts corresponds quite closely to the Cherokee bone tools and artifacts reported from Chota and Citico (Bogan 1976:109-116; 1980). The trade combs from Toqua resemble the European trade comb from Chota (Bogan 1976:fig. 12a). Deer ulna "awls," antler "pins" and the fragments of box turtle rattles and bowls were found in the Cherokee occupations at Toqua, Chota and Citico. The round drilled bone buttons were not recovered from Chota, but neither were Cherokee bone "bangles" in the Cherokee faunal sample from Toqua (see Bogan 1976: 113, fig. 12).

Comparison of the Overhill Cherokee Sample

The faunal samples from the three historic Cherokee villages, Toqua, Chota and Citico, provide a unique opportunity to compare faunal utilization by three contemporanous villages. The sample from Chota (Bogan 1976) provides a look at the faunal utilization at the major political center in the Little Tennessee River Valley while the Toqua and Citico samples are from smaller historic Cherokee villages. The samples are quite large and were obtained from what may be assumed to be representative areas of the Cherokee occupations.

Based on the ethnohistoric literature and the analysis of the faunal assemblage from Chota and Citico (Bogan 1976; 1980), the faunal sample from Toqua should reflect the primary importance of the white-tailed deer, followed by the bear, while domestic stock should represent only a minimal dietary supplement. Various species of birds, turtles and fish, while diverse, provided only occasional dietary supplements.

The mammal species from Toqua, Chota and Citico correspond both in diversity (species richness) and relative percentage of MNI. Two species, the hispid cotton rat and pine vole, were represented in the Toqua sample but not in the Chota sample. The Chota sample contained remains of two bats and a long-tailed weasel which were not recorded at Toqua (Table 13, pp.143 ; Bogan 1976:54-57).

The important food species (mammals, birds) identified in the faunal samples recovered from the 1978 Citico excavations (Bogan 1980), Toqua (Table 13, pp. 143) and the 1969-1973 escavations at Chota are presented in Table 14. The deer and pig elements from the two samples, the Colonial (1746-1775) and Federal (1794-1819) periods from Citico, were

Table 14: Comparison of Part of the Cherokee Faunal Sample from Chota, Toqua and Citico.

	Chota			Toqua								Citico							
				Features			Zone B			Total		Colonial Period			Federal Period			Total	
	Sample	MNI	%	Sample	MNI	%	Sample	MNI	%	MNI	%	Sample	MNI	%	Sample	MNI	%	MNI	%
Mammals																			
Bear	702	21	15.55	372	9	9.09	97	4	13.33	13	10.07	8	2	15.38	39	3	12.00	5	13.15
Raccoon	21	3	2.22	16	4	4.04	7	3	10.00	7	5.42	1	1	7.69				1	2.63
Pig	162	8	5.92	48	4	4.04				4	3.10	14	2	15.38	538	14	56.00	16	42.10
White-tailed deer	3053	70	51.85	1454	35	35.35	182	7	23.33	42	32.55	133	8	61.53	113	8	32.00	16	42.10
Other mammals	864	33	24.44	457	47	47.47	47	16	53.33	63	48.83	45			28				
Total	4802	135	99.98	2347	99	99.99	333	30	99.99	129	99.97	201	13	99.98	718	25	100.00	38	99.98
Birds																			
Waterfowl	19	5	13.88	31	11	28.94				11	23.91				2	1	20.00	1	11.11
Turkey	56	8	22.22	74	8	21.05	23	3	37.50	11	23.91	2	2	50.00	4	1	20.00	3	33.33
Chicken	97	8	22.22	29	3	7.89				3	6.52	2	2	50.00	14	3	60.00	5	55.55
Passenger pigeon	1	1	2.77	39	3	7.89	12	2	25.00	5	10.86								
Other birds	48	14	38.88	29	13	34.21	6	3	37.50	16	34.78	5			3				
Total	221	36	99.97	202	38	99.98	41	8	100.00	46	99.98	9	4	100.00	23	5	100.00	9	99.99

compared using the chi-square test and found to be significantly different at the .001 level (X^2=300.67, df=1). The deer and pig MNI from the Colonial and Federal Period samples from Citico were tested and were significant at the .025 level (X^2=5.236, df=1). Also the mammals from the two samples from Toqua (features, Zone B) were compared and not found to be significantly different (Table 15). However, pig remains were absent from Zone B. The mammal MNI from Chota, Toqua (features and total) and Citico (Colonial) were compared and no significant differences were found between them (Tables 16,17). This illustrates the consistency in the relative importance of the four major mammals in the diet at three Overhill Cherokee villages during the Colonial Period. These three Colonial Period samples and the combined sample from Toqua were compared with the Federal Period sample from Citico. All Colonial Period samples are significantly different than the Citico Federal Period sample (Tables 18, 19, 20). Although the Federal Period sample from Citico is small, it illustrates the marked change in the role of native and domestic stock in the Overhill Cherokee diet. The white-tailed deer continued to be an important item in the Cherokee diet, but was first supplemented and then replaced by the pig as the major meat resource. The horse, cow, elk and bison, although providing a large amound of meat, contributed only an occasional meat supplement to the deer, bear and pig. These observations on the changing role of domestic animals in the Cherokee diet, confirm Newman's (1979) conclusion based on the ethnohistoric and ethnographic literature.

Birds comprised only a minor dietary supplement in the Cherokee food economy. Remains of seven species, the loon, sora, ruddy turnstone, great horned owl, barred owl, purple martin and the grackle occurred in the Chota

Table 15: Comparison of Some Mammal MNI from the Two Cherokee faunal Samples from Toqua (40MR6).

	Features			Zone B			
	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	Total
Bear	9	10.24	.150	4	2.75	.568	13
Pig and Raccoon	8	8.66	.050	3	2.33	.192	11
Deer	35	33.09	.110	7	8.90	.405	42
	52			14			66
	df=2		$X^2=1.475$		p<.5		

Table 16: Comparison of Some Mammal MNI from Chota, Citico and Toqua (Features) Colonial Period Cherokee Faunal Samples.

	Chota			Toqua (Features)			Citico (Colonial)			
	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	Total
Bear	21	19.54	.109	9	9.96	.092	2	2.49	.096	32
Raccoon	3	4.88	.724	4	2.49	.915	1	.62	.232	8
Pig	8	8.55	.035	4	4.25	.028	2	1.08	.783	14
Deer	70	69.01	.014	35	35.18	.001	8	8.79	.071	113
Total	102			52			13			167

df=6 χ^2=3.1 p<.9

Table 17: Comparison of Some Mammal MNI from Chota, Citico and Toqua (Total) Colonial Period Cherokee Faunal Samples.

	Chota			Toqua (Total)			Citico (Colonial)			
	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	Total
Bear	21	20.28	.025	13	13.12	.001	2	2.58	.130	36
Raccoon	3	6.19	1.643	7	4.01	2.229	1	.79	.055	11
Pig	8	7.88	.001	4	5.10	.237	2	1.00	1.000	14
Deer	70	67.62	.083	42	43.75	.07	8	8.61	.043	120
Total	102			66			13			181

df=6 χ^2=5.517 p<.5

Table 18: Comparison of Some Mammal MNI between Chota and the Citico Federal Period Cherokee Faunal Samples.

	Chota fo	Chota fe	Chota $(o-e)^2/e$	Citico (Federal) fo	Citico (Federal) fe	Citico (Federal) $(o-e)^2/e$	Total
Bear	21	19.27	.155	3	4.72	.626	24
Pig and Raccoon	11	20.07	4.098	14	4.92	16.757	25
Deer	70	62.64	.864	8	15.35	3.519	78
Total	102			25			127

df=2 X^2=26.019 p<.001

Table 19: Comparison of Some Mammal MNI between Toqua (Features) and the Citico Federal Period Cherokee Faunal Samples.

	Toqua (features) fo	Toqua (features) fe	Toqua (features) $(o-e)^2/e$	Citico (Federal) fo	Citico (Federal) fe	Citico (Federal) $(o-e)^2/e$	Total
Bear	9	8.13	.093	3	3.89	.203	12
Pig and Raccoon	8	14.85	3.159	14	7.14	6.590	22
Deer	35	29.03	1.227	8	13.96	2.544	43
Total	52			25			77

df=2 X^2=13.816 p<.001

Table 20: Comparison of Some Mammal MNI between Toqua (Total) and the Citico Federal Period Cherokee Faunal Samples.

	Toqua (Total)			Citico (Federal)			
	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	Total
Bear	13	11.60	.168	3	4.39	.440	16
Pig and Raccoon	11	18.13	2.804	14	6.86	7.431	25
Deer	42	36.26	.908	8	13.73	2.391	50
Total	66			25			91
	df=2		X^2=14.142		p<.001		

sample, but not in the one from Toqua. In contrast, 10 species (bobwhite, Canada goose, mallard/black duck, merganser, sparrow hawk, greater yellowlegs, woodpecker, crow, cardinal and fringilid) were identified from the Toqua sample but were not encountered in the Chota sample. The small avian sample from Citico contained remains of turkey, chicken and cf. sora. Possibly only seven of these 20 species were used as food while the others may have had some role in mythology or the body parts were used in connection with medical practices. The role of the turkey is comparable between Chota and Toqua, but the chicken comprised 22.2% of the avian MNI at Chota as opposed to the 7.8% at Toqua. Conversely, the passenger pigeon was represented by only one individual in the Chota sample but its remains comprised 7.8% of the bird MNI at Toqua, it was absent in the Citico sample (Table 14, 162). Waterfowl would have provided a seasonal dietary supplement. Their elements comprised 13.8% of the bird MNI at Chota compared with 28.9% at Toqua, but were absent in the Citico sample. The avian MNI in the Chota sample are not significantly different from those in the features at Toqua or from the Federal Period sample from Citico. Although the Citico aivan sample is small, it is interesting to note the total absence of the passenger pigeon and waterfowl in the Colonial Period. However, this difference may be related to sample size.

The eastern box turtle dominated the turtle remains identified in the Chota, Toqua and Citico samples. MNI were not figured for the map/slider/painted turtles (Graptemys/Pseudemys/Chrysemys) or the softshell turtles from the Chota sample due to poor bone preservation which could effect the estimation of their relative importance in the diet. In the Toqua faunal assemblage, the map/slider/painted turtle group was second in number of elements to the box turtle, followed in relative abundance by the softshell and the snapping turtle. The aquatic turtles, because of their large size, would have contributed an equal or greater amount of meat to the diet than the more numerous but smaller box turtle.

Amphibians comprised only a small fraction of the faunal remains from the three sites and probably contributed only minimally to the diet. The eastern spadefoot toad was one of the most common amphibians represented in the Citico and Toqua samples, but was absent at Chota. The eastern spadefoot toad, because of its burrowing habits, as well as the true toads (Bufo sp.) were probably incidental to the human occupation of the sites. The bullfrog and other frogs may have been eaten (Bogan 1976:71-72). Remains of the hellbender, an aquatic salamander, occurred at both Toqua and Chota. This large salamander would have been available throughout the year and provided a food supplement. However, there is no ethnographic evidence of the Cherokee eating this animal (Bogan 1976:71).

The fish species identified from the Cherokee faunal assemblages at Chota and Citico are roughly similar to those from Toqua but with a higher species diversity. Minnows, northern hogsucker, flathead catfish and sauger/walleye were identified in the asseblage from Toqua but were absent in the Chota sample; the cf. golden redhorse and cf. bluegill were the only two species identified from Chota, but were absent at Toqua. The Citico sample included most of the species represented at Chota including minnows and sauger/walleye. The sauger/walleye and the suckers spawn during the spring (April-May) and are available in large numbers at this time (Pflieger 1975; Smith 1979). These fish would also have reached their highest nutritional value during their spawning period (Rostlund 1952:3-6).

The ethnographic and ethnohistoric literature documents the use of fish weirs (Williams 1948:69), weirs with cane baskets (Williams 1930:432), fish poisons (Williams 1930:432), simple spears (Williams 1930:433) and fishhooks (Rostlund 1952:122) by the Cherokee. Freshwater drum, sauger/walleye, catfish and the sunfish could have been taken with a hook, poison or in fish weirs. Comparing the MNI for each species of fish, drum followed by suckers dominate the Chota assemblage, while the fish fauna identified at Toqua is dominated by suckers followed by catfish and freshwater drum. There are three possible explanations for these differences in the fish faunas 1.) The degree of bone preservation at Chota was poorer than at Toqua, with fewer of the more fragil fish bones preserved at Chota. However, this proposition may be questioned since elements of centrarchids, which may be considered more "fragile" than the corresponding elements of suckers and drum, occurred in the Chota sample. 2.) The recovery techniques utilized during the 1969-1973 excavations may have been biased against the recovery of fish remains (e.g. shovel sorting). 3.) The frequency of the freshwater drum, catfish and sucker remains were compared between Chota and Toqua. The occurrence of these three groups of fish between Chota and Toqua is significantly different at the .001 level (Table 21). The MNI for the catfish, drum and suckers from Chota and Toqua were also compared with the chi-square test (Table 22). The MNI were not tabulated for the category sucker (Catostomidae) in the Chota sample (Bogan 1976:50) so the MNI for this category in the Toqua sample were not used in this comparison. The samples were significantly different at the .05 level. The drum MNI are about equal between the two samples, but the occurrence of catfish and suckers are lower in the Chota sample than in the Toqua sample. This suggests a different pattern of fish utilization between

Table 21: Comparison of the Sucker, Catfish and Drum Elements between Chota and Toqua (Total).

	Chota			Toqua (Total)			
	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	Total
Suckers (Catostomidae)	127	164.87	8.698	398	360.12	3.984	525
Catfish (Icataluridae)	24	18.52	1.621	35	40.47	.739	59
Drum	77	44.59	23.557	65	97.40	10.777	142
Total	228			498			726
	df=2		$X^2=49.376$		$p<.001$		

Table 22: Comparison of the Sucker, Catfish and Drum MNI between Chota and Toqua (Total).

	Chota			Toqua (Total)			
	fo	fe	$(o-e)^2/e$	fo	fe	$(o-e)^2/e$	Total
Suckers (Catostomidae)	7	10.50	1.166	23	19.50	.628	30
Catfish (Ictaluridae)	3	3.85	.187	8	7.15	.101	11
Drum	11	6.65	2.845	8	12.35	1.532	19
Total	21			39			60
	df=2		$X^2=6.459$		$p<.05$		

Chota and Toqua. Occupants at both sites seem to have been fishing for drum, but the utilization of the catfish and suckers declines at Chota, possibly indicating a decrease in or the less frequent use of fish weirs at Chota. Conversely, the fish MNI frequencies at Toqua could indicate a continued reliance on the use of fish weirs in the Little Tennessee River and the harvesting of spawning suckers in the spring. The small sample of fish remains from Citico appears to closely correspond to the Toqua sample.

The three historic Overhill Cherokee Colonial Period faunal samples are very similar, not only in the species utilized, but also the relative frequencies of the important food species. This suggests that the acceptance of Euro-American domesticates (i.e. pig and chicken) during the Colonial Period was fairly uniform throughout the Overhill Cherokee groups. The only striking difference between the three samples was in the fish remains. The lower frequency of suckers and catfish may be a food preference, the difference in field techniques or a differential use of fish weirs.

The Federal Period Overhill Cherokee faunal sample from Citico provides some insight into the Cherokee acceptance of Euro-American domesticates and the continuing role of native species. Deer, bear and turkey continued to be used, but the pig played a much more important role in the diet. The same species found in Colonial Period faunal samples continued to be exploited by the Federal Period Overhill Cherokee.

CHAPTER IV

MOLLUSCAN REMAINS

Introduction

Archaeological molluscan remains can be an important source of information about the cultural activities at an aboriginal site. Morrison (1941), Matteson (1960), Parmalee (1960), Stansbery (1965; 1966) and Warren (1975) have demonstrated the value of the freshwater naiads in reconstructing former local riverine ecology and molluscan zoogeography as well as the food habits of aborigines. Recently, Parmalee and Klippel (1974) have documented the relatively low nutritional value of unionids and their supplementary role in the diet. Soft parts of freshwater gastropods also have been analyzed and found to provide only about 90 calories per 100 grams of meat (this study). Valves of freshwater molluscs were used as a tempering material for pottery, spoons, pottery tools and decorative items. Certain marine molluscs (e.g. cockles, *Olivella* and *Marginella*) were traded into the interior and were modified for use as ornaments. Principally, whelks or conchs of the genus *Busycon* were fashioned into cups, shell masks, gorgets, earpins and columella and shell beads.

The freshwater molluscan fauna of the Little Tennessee River is poorly known compared with that inhabiting the upper Tennessee and Clinch rivers (Ortmann 1918). Remington and Clench (1924) mention collecting in the Little Tennessee River, but do not present a comprehensive list of the molluscs they collected. H. D. Athearn collected molluscs at several stations along the lower Little Tennessee River during the period 1957 to

1965 (T.V.A. 1972). The species collected and those reported by T.V.A. biologists are listed in Table 23. Certain taxonomic revisions incorporated by the author reflect certain accepted changes in the recognized taxonomy of some species and genera. The taxonomy of the pleurocerid snails has long been a source of confusion; most of the terminology used here follows the system in Bogan and Parmalee (n.d.). Classification of the viviparid snails is also difficult; Campeloma for example, is parthenogenetic and lines between species are unclear. The archaeological specimens are refered only to the generic level.

Robison (1978) examined the Cherokee and Dallas faunal remains from 1974 and 1975 excavations at Tomotley (40MR5) and reported 15 species of pelecypods and six species of aquatic gastropods (Table 23). He reported 11 pelecypods and one gastropod not recorded by T.V.A. The historic Cherokee faunal remains recovered from Citico contained freshwater molluscs which have been included in Table 22 as documentation of the historic occurrence of some of the freshwater molluscs in the Little Tennessee River (Bogan 1980).

The freshwater molluscan fauna recovered from the archaeological excavations at Toqua can be used to reconstruct some of the former riverine conditions in the vicinity of the site. Bivalves found associated with Dallas burials at Toqua add two new species to the faunal list reported by T.V.A. (1972) and Robison (1978), while the Dallas and Cherokee midden faunal samples add another 13 species to the list of known naiads formerly inhabiting the Little Tennessee River. The fauna undoubtedly also contained several other thin-shelled species such as Hemistena lata and Cumberlandia monodonta not identified in the archaeological samples. The archaeological and historic collections combined document 46 species of naiads as having formerly inhabited the Little Tennessee River.

Table 23: Historic and Archaeological Mollusks from the Little Tennessee River.

T.V.A. (1972)	Tomotley(40MR5) (Robison 1978)	Toqua(40MR6)	Citico(40MR7) (Bogan 1980)
Pelecypods	Pelecypods	Pelecypods	Pelecypods
		Amblema plicata	
Fusconaia barnesiana	Fusconaia barnesiana	Fusconaia barnesiana	Fusconaia barnesiana
Fusconaia maculata	Fusconaia maculata	Fusconaia maculata	Fusconaia maculata
	Quadrula cylindrica	Quadrula cylindrica	
Quadrula intermedia			
		Quadrula metanevra	
		cf. Quadrula pustulosa	
	Cyclonaias tuberculata	Cyclonaias tuberculata	Cyclonaias tuberculata
	Elliptio crassidens	Elliptio crassidens	Elliptio crassidens
Elliptio dilatatus	Elliptio dilatatus	Elliptio dilatatus	Elliptio dilatatus
	cf. Lexingtonia dolabelloides	Lexingtonia dolabelloides	cf. Lexingtonia dolabelloides
	cf. Plethobasus cooperianus	Plethobasus cooperianus	Plethobasus cooperianus
		Plethobasus cyphyus	
		Pleurobema cf. clava	
		Pleurobema coccineum	
Pleurobema cordatum	Pleurobema cordatum	Pleurobema cordatum	Pleurobema cordatum
Pleurobema oviforme		Pleurobema oviforme	
		Pleurobema plenum	Pleurobema cf. plenum
Pleurobema pyramidatum		Pleurobema pyramidatum	
Alasmidonta marginata			
Anodonta grandis		Anodonta grandis	
Strophitus undulatus			
	Actinonaias ligamentina	Actinonaias ligamentina	Actinonaias ligamentina
	Epioblasma arcaeformis	Epioblasma arcaeformis	
		E. arcaeformis/triquetra	
		Epioblasma brevidens	
Epioblasma capsaeformis		Epioblasma cf. capsaeformis	
Epioblasma florentina			
Epioblasma haysiana		Epioblasma haysiana	Epioblasma haysiana
		Epioblasma propinqua	
	Epioblasma stewardsoni	Epioblasma stewardsoni	
		Epioblasma torulosa	
Lampsilis fasciola		Lampsilis fasciola	
Lampsilis ovata		Lampsilis ovata	Lampsilis ovata
		Lemiox rimosa	
Leptodea laevissima			
		Ligumia recta	
Medionidus conradicus		cf. Medionidus conradicus	
		Obovaria retusa	
		Obovaria subrotunda	
Potamilus alata		Potamilus alata	Potamilus alata
Villosa iris			
Villosa vanuxemi		Villosa vanuxemi	
		Cyprogenia irrorata	
	Dromus dromas	Dromus dromas	Dromus dromas
	Ptychobranchus fasciolare	Ptychobranchus fasciolare	Ptychobranchus fasciolare
	Ptychobranchus subtentum	Ptychobranchus subtentum	

Table 23 (Continued)

T.V.A. (1972)	Tomotely(40MR5) (Robison 1978)	Toqua(40MR6)	Citico(40MR7) (Bogan 1980)
Aquatic Gastropods	Aquatic Gastropods	Aquatic Gastropods	Aquatic Gastropods
Viviparidae	Viviparidae	Viviparidae	
Campeloma rufum	Campeloma sp.	Campeloma sp.	
Pleuroceridae	Pleuroceridae	Pleuroceridae	Pleuroceridae
Athearnia anthonyi	Athearnia anthonyi	Athearnia cf. anthonyi	
	Io fluvialis	Io fluvialis	Io fluvialis
		Athearnia/Leptoxis	
		Leptoxis praerosa	
Leptoxis subglobosa	Leptoxis subglobosa		Leptoxis cf. subglobosa
Lithasia verrucosa	Lithasia verrucosa	Lithasia verrucosa	
Goniobasis archnoidea		Goniobasis cf. archnoidea	
Goniobasis claviformis			
Pleurocera canaliculatum	Pleurocera canaliculatum	Pleurocera canaliculatum	Pleurocera canaliculatum
Pleurocera curtum roanense			Pleurocera cf. curtum
Pleurocera unciale			
		Pleurocera curtum/unciale	

The molluscan remains recovered from the village excavations at Toqua are tabulated in Table 24. Table 24 includes those shells found in features, structures and general midden deposits and are tabulated by village area, disturbed area and Cherokee occupation. Many of the species listed (Tables 23, 24) are endemic to the Tennessee and Cumberland River systems (Ortmann 1924), inhabiting the shoals and riffles, areas with sand and gravel substrates. Most species of naiads listed in Table 22 inhabit sand and gravel substrates in water from about six inches to three feet in depth, usually in or adjacent to areas with current. Animals such as Lampsilis ovata and Potamilis alata may also be found in soft mud and sand bottoms. Anodonta grandis inhabits areas of quiet water with a mud or sand substrate. Ortmann (1918:559) noted only one lake in the upper Tennessee drainage above Chattanooga that contained A. grandis.

The aquatic gastropods identified in the archaeological assemblage correspond to those collected historically (Table 23), while the only addition is the spiny river snail, Io fluvialis. Campeloma sp. and Pleurocera canaliculatum both inhabit sand or mud substrates along the margins of rivers while Io fluvialis, Leptoxis sp. and Athearnia sp. are found on rocks in areas with moderate to strong current (Bogan and Parmalee n.d.). Lithasia verrucosa is often found on rocks in shallow water with some current (Bogan and Parmalee n.d.; Hickman 1937).

The composite ecological habitat that can be reconstructed from the archaeological molluscan remains is analogous to the former shoal areas of the Clinch and Tennessee rivers. These rivers had a rich molluscan fauna inhabiting the shoal and riffle areas with a variety of forms living in pools, ponds and backwaters. The freshwater bivalves from Toqua were probably collected from similar habitats. The shoal area at the head of

Table 24: Summary of Shell Remains by Village Area.

Pelecypods	Cherokee						Dallas												Plowzone/Disturbed								Total	
	Zone 8		Features		Total	%	W. Village		N. Village		Mound A		E. Village Midden		E. Village		Total	%	E. Village Midden		N. Village		Mound B					
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%			Total	%	Total	%	Total	%	Total	%	Total	%
Amblema plicata	1	1.11	4	1.06	5	1.07	1	4.00	3	.86	1	.7	6	.69			11	.80			3	1.75			3	1.41	19	.93
Fusconaia barnesiana			42	11.20	42	9.03	1	4.00	15	4.32	6	4.7	28	3.25			50	3.66	2	4.87	9	5.26			11	5.18	103	5.04
Fusconaia cf. barnesiana			3	.80	3	.64			1	.28			5	.58			6	.43									9	.44
Fusconaia subrotunda	34	37.77	113	30.13	147	31.61	8	32.00	75	21.61	30	23.8	258	29.96	2	33.33	373	27.32	4	9.75	57	33.33			61	28.77	581	28.45
Fusconaia cf. subrotunda											1	.7	3	.34			4	.29			1	.58			1	.47	5	.24
Quadrula cylindrica			1	.26	1	.21					1	.7					1	.07									2	.09
Quadrula cf. cylindrica													1	.11			1	.07									1	.04
Quadrula metanevra			1	.26	1	.21							3	.34			3	.21	1	2.43	1	.58			2	.94	6	.29
cf. Quadrula pustulosa			1	.26	1	.21																					1	.04
Cyclonaias tuberculata			4	1.06	4	.86			3	.86	1	.79	8	.92	1	16.66	13	.95	2	4.87	2	1.16			4	1.88	21	1.02
Elliptio crassidens	5	5.55	11	2.93	16	3.44			10	2.88	1	.79	7	.81			18	1.31			10	5.84			10	4.71	44	2.15
Elliptio dilatatus	5	5.55	13	3.46	18	3.87	12	48.00	36	10.37	47	37.30	209	24.27			304	22.27	12	29.26	21	12.28			33	15.56	355	17.38
Lexingtonia dolabelloides			10	2.66	10	2.15			8	2.30	2	1.58	15	1.74			25	1.83			3	1.75			3	1.41	38	1.86
cf. Lexingtonia dolabelloides									1	.28							1	.07									1	.04
Plethobasus cyphyus																					1	.58			1	.47	1	.04
Plethobasus cooperianus			3	.80	3	.64			1	.28			10	1.16			11	.80									14	.68
Pleurobema coccineum													1	.11			1	.07									1	.04
Pleurobema cordatum	1	1.11	3	.80	4	.86			3	.86			12	1.39			15	1.09	1	2.43	3	1.75			4	1.88	23	1.12
Pleurobema oviforme	1	1.11	11	2.93	12	2.58			4	1.15	1	.79	12	1.39			17	1.24			1	.58			1	.47	30	1.46
Pleurobema cf. oviforme									3	.86			1	.11			4	.29									4	.19
Pleurobema plenum	2	2.22	7	1.86	9	1.93			4	1.15			10	1.16			14	1.02	2	4.87	1	.58			3	1.41	26	1.27
Pleurobema pyramidatum			2	.53	2	.43			1	.28			3	.34			4	.29									6	.29
Pleurobema sp.			5	1.33	5	1.07																					5	.24
Actinonaias ligamentina	22	24.44	67	17.86	89	19.13			50	14.40	2	1.58	46	5.34	2	33.33	100	7.32	4	9.75	25	14.61			29	13.67	218	10.67
Epioblasma arcaeformis			2	.53	2	.43							1	.11			1	.07									3	.14
E. arcaeformis/triquetra													1	.11			1	.07									1	.04
Epioblasma brevidens													1	.11			1	.07									1	.04
Epioblasma cf. capsaeformis			2	.53	2	.43			1	.28	7	5.55	1	.11			9	.65			1	.58			1	.47	12	.58
Epioblasma haysiana	1	1.11	1	.26	2	.43			1	.28			5	.58			6	.43			1	.58			1	.47	9	.44
Epioblasma propinqua			3	.80	3	.64							5	.58			5	.36									8	.39
Epioblasma stewardsoni									1	.28			1	.11			2	.14									2	.09
Epioblasma torulosa													2	.23			2	.14									2	.09
Epioblasma sp.									1	.28							1	.07									1	.04
Lampsilis fasciola			2	.53	2	.43			1	.28	1	.79	4	.46			6	.43									8	.39
Lampsilis ovata	3	3.33	8	2.13	11	2.36	1	4.00	28	8.06	2	1.58	23	2.67			54	3.95			8	4.67			8	3.77	73	3.57
Lemiox rimosa	1	1.11			1	.21							1	.11			1	.07									2	.09
Ligumia recta									2	.57			3	.34			5	.36									5	.24
cf. Medionidus conradicus			1	.26	1	.21			1	.28	10	7.93					11	.80									12	.58
Obovaria retusa													1	.11			1	.07									1	.04
Obovaria subrotunda									1	.28			1	.11			2	.14									2	.09
Proptera alata			1	.26	1	.21			1	.28			1	.11			2	.14			1	.58			1	.47	4	.19
cf. Proptera alata																					1	.58			1	.47	1	.04
Villosa vaunxemi													1	.11			1	.07									1	.04
Villosa cf. vaunxemi											3	2.38	1	.11			4	.29									4	.19
Cyprogenia irrorata																					1	.58			1	.47	1	.04
Dromus dromas	11	12.22	38	10.13	49	10.53	1	4.00	21	6.05	1	.79	95	11.03	1	16.66	119	8.71	13	31.70	11	6.43			24	11.32	192	9.40
Ptychobranchus fasciolare	2	2.22	6	1.60	8	1.72			9	2.59	1	.79	11	1.27			21	1.53			4	2.33			4	1.88	33	1.61
Ptychobranchus subtentum	1	1.11	10	2.66	11	2.36	1	4.00	61	17.57	8	6.34	63	7.31			133	9.74			5	2.93			5	2.35	149	7.29
Ptychobranchus cf. subtentum													1	.11			1	.07									1	.04
Total Identified	90	99.96	375	99.88	465	99.90	25	100.00	347	99.81	126	99.91	861	99.80	6	99.98	1365	99.77	41	99.93	171	99.89			212	99.90	2042	99.70
Indeterminate Pelecypod	47		478		525		65		302		93		486		3		949		13		159				172		1646	
Total Pelecypod	137		853		990		90		649		219		1347		9		2314		54		330				384		3688	
Terrestrial Gastropod	3		24		27		-		158		6		4		-		168				4				4		199	
Aquatic Gastropod																												
Athearnia cf. anthonyi	2	1.01	8	.41	10	.47	3	.92	15	.31	1	1.16	29	.91			48	.57			2	.12			2	.12	60	
Athearnia/Leptoxis													2	.06			2	.02									2	
Campeloma sp.	2	1.01	5	.25	7	.32	1	.30	13	.27			11	.34			25	.29	1	2.00	7	.43			8	.48	40	
Io fluvialis	6	3.03	7	.36	13	.61			12	.25	1	1.16	11	.34			24	.28			78	4.84			78	4.70	102	
Leptoxis praerosa	7	3.53	383	19.87	390	18.35	58	17.84	680	14.17	15	17.44	696	21.85			1449	17.22	3	6.00	111	6.89			114	6.87	1953	
Oxytrema canaliculatum	178	89.89	1208	62.68	1386	65.22	182	56.00	2922	60.92	58	67.44	1970	61.85	21	95.45	5153	61.24	46	92.00	1326	82.41			1372	82.70	7911	
Oxytrema curtum/unciale			11	.57	11	.51	3	.92	52	1.08			28	.87			83	.98			2	.12			2	.12	96	
Pleurocera verrucosa			62	3.21	62	2.91	8	2.46	38	.79	3	3.48	70	2.19			119	1.41			16	.99			16	.96	197	
Goniobasis cf. archnoides									3	.06							3	.03									3	
Goniobasis sp.									1	.02	1	1.16					2	.02									2	
Indeterminate Pleurocerid	3	1.51	243	12.62	246	11.57	69	21.23	1060	22.10	7	8.13	368	11.55	1	4.54	1505	17.88			67	4.16			67	4.03	1818	
Helisoma sp.							1	.30									1	.01									1	
Total	198	99.99	1927	99.96	2125	99.96	325	99.97	4796	99.97	86	99.97	3185	99.96	22	99.99	8414	99.95	50	100.00	1609	99.96			1659	99.98	12,189	
Marine shell																												
Busycon																												
Disc											1		1				2										2	
Bead			7		7		6		7		103		21				137		1				2		3		147	
Columella			1		1						10		1				11										12	
Worked frag nt			2		2				1		7		1				9		2						2		13	
Marginella			1		1				7				2				9										10	
Olivella													1				1										1	
Cockle									1				1				2										2	
Total			11		11		6		16		121		28				171		3				2		5		187	
Total	338		2815		3153		421		5619		432		4564		31		11,067		107		1943		2		2052		16,272	

Calloway Island above the Toqua site and at the toe of the island would have been ideal collecting areas as would the mouth of Toqua Creek, downriver from the site. These are only the closest potential collecting locales, probably numerous other sites were also used.

Identification of Freshwater Mollusks in Mississippian Sites

Analysis of freshwater molluscan assemblages from Mississippian archaeological site have been relatively few in number. Baker (1932) examined a sample of mollusks from the Etowah site, Georgia, and later van der Schalie and Parmalee (1960) identified another sample of mollusks from this large Mississippian village and mound complex. They documented the use of 25 species of freshwater unionids and five species of freshwater aquatic gastropods (van der Schalie and Parmalee 1960:41, 43). Parmalee (1962:9) reported the use of 25 species of pelecypods by the Mississippian inhabitants of the Kingston Lake site, Illinois. Another major paper on Mississippian shell utilization concerned unionids recovered from the Angel site, Indiana (Parmalee 1960). These papers document the widespread harvesting and utilization of freshwater mollusks by Mississippian groups either for shell tempering in pottery or as a supplemental food resource. Lewis and Kneberg (1946:46) commented on the quantities of bivalve shells, as well as the abundant remains of aquatic gastropods, especially the periwinkle (*Pleurocera canaliculatum*), in Dallas refuse pits and midden at Hiwassee Island.

Dallas Mollusk Utilization

The quantities and species of aquatic mollusks gathered by the Dallas occupants at Toqua suggests several uses other than the collecting of shell for pottery temper (Table 24). The wide range of species and lack of emphasis on or selection for larger species such as Lampsilis ovata and Actinonaias ligamentina suggests that the bivalves were collected in relation to availability. The occurrence of 78 valves of Lampsilis ovata with burials was the only observed selection of freshwater shells. The single valve of Anodonta grandis encountered was apparently used as a spoon. Only 11 right valves of L. ovata from burials were modified into spoons. The pseudocardinal and lateral teeth on these spoons had been cut or ground off and the ventral margin modified into a handle. The occurrence of more left that right valves associated with burials suggests that those individuals buried with spoons made from left valves were right-handed, if it is assumed the individual buried had used the spoons. Thruston observed that all of the shell spoons in his collection "were made for use in the 'right-hand', showing that the mound builder like his white successor was 'Right-handed'." (1973:312-313).

Slightly over 20% of the bivalves associated with burials were elongate slender shell (E. dilatatus and both species of Ptychobranchus). These shells approach the form of freshwater shells Stern (1951: pl. I, fig. k) described as having been used in pottery manufacture by the historic Pamunkey of Tidewater Virginia. These elongate bivalves may have been placed in the graves representing pottery tools.

The freshwater pelecypods would have provided a source of pearls, although this does not imply that the 63 freshwater pearl beads from Toqua burials came from the Little Tennessee River. Pearls were widely used as beads in the Southeast as recorded by the DeSoto chroniclers.

Shell scattered in the midden and features may be interpreted as possibly food refuse, but discrete piles of shill on the floor of living structures suggests other functions (i.e. storage of pottery temper, pottery tools or a childs shell collection); The role of the numerous aquatic gastropods is ambiguous since most of the shells are not broken and very few are burned. This unmodified condition might suggest the boiling of the gastropods for extraction of the meat. Aquatic snails probably provided only a minor dietary supplement.

At Toqua, the distribution of the bivalves was lowest in the West Village and Mound A structures, midden and features compared with the larger numbers from North Village (Table 24). The highest concentration of bivalves occurred in the East Village Midden. The gastropods follow a distribution pattern similar to the bivalves, but show a slightly higher concentration in the North Village than in the East Village Midden (Table 24). The most numerous of the gastropods were the periwinkle, *Pleurocera canaliculatum*, followed by *Leptoxis subglobosa*, together constituting more than 70% of the sample from each village area. North Village had the highest concentration of gastropods and the highest total of all mollusc shells. The majority of the shell in North Village, including the terrestrial molluscs, was derived from Structure 3. East Village Midden Area had the highest concentration of bivalves.

The most common burial items were the shell beads of various shapes and sizes made from the columella and whorl of the marine conch *Busycon*. These bead forms were often accompanied by those made of olive and *Marginella* shells. It is interesting to note that of all of the shell beads recovered at Toqua, none were fashioned from *Leptoxis* (=*Anculosa*) as was the case in sites along the Illinois and lower Ohio rivers. These shells were locally very abundant in the Little Tennessee River. Shell masks, gorgets, "button" beads, discs and pendants were manufactured from sections of the body whorl of whelks. The conch shell with the columella removed was used as a cup, while one small conch, drilled at one end, was apparently used as a pendant. The columella was used in the manufacture of earpins and beads. All of the finished products are evident in the burials and in some of the midden at Toqua, but there were no unmodified marine shell or shell fragments which would support the idea that the whole shells were brought to Toqua and worked into the various end products. It would appear that the various artifacts were manufactured elsewhere and traded to the richer inhabitants of Toqua. Three unmodified cockles and a scotch bonnet were also recovered at the site. The only comparable assemblage of marine shells include a cache of cockles reported from the Citico site (Myers 1964); no other scotch bonnets have been reported from archaeological sites in Tennessee.

Cherokee Shell Remains

The 3115 freshwater molluscs from Zone B and the Cherokee features document another aspect of Cherokee subsistence and animal resource utilization (Table 24). Some shell was used in ceramic tempering, but most of the shell represents food residue. The role of the molluscs was only supplementary. The variety of species in the Cherokee midden sample included a series similar to that in the Dallas sample, but with some important species frequency differences. The relative percentage of *Fusconaia subrotunda* remained high, but the incidence of *Elliptio dilatatus* and *Ptychobranchus* declined. The abundance of *L. ovata* was about the same although the frequency of *A. ligamentina* nearly tripled. This suggests the Cherokee exercised a degree of selection for the "meatier" species over the lanceolate species or that for some reason the Dallas occupants favored the lanceolate forms. Other alternative explanations for this change in frequencies might be a factor of exploitation methods, fluctuation in the local populations or a change in the habitat exploited. Ethnographically, the use of shell in the Southeast for food was not widely documented, thus supporting the inferred role of molluscs in the Cherokee diet as a supplementary one.

CHAPTER V

DISCUSSION

Summary and Comparison

The major objectives of this study were to determine possible patterns of faunal utilization for the late prehistoric Dallas occupation at Toqua and to compare the Dallas pattern with that of the historic Overhill Cherokee in the Little Tennessee River Valley. The Dallas evidence is based on the large faunal sample recovered from excavations in the six village areas at Toqua (40MR6), while the Overhill Cherokee subsistence information is drawn from the Cherokee occupations at Toqua (40MR6: Table 13, pp. 143), Chota (40MR2; Bogan 1976) and Citico (40MR7; Bogan 1980).

The generalized prehistoric meat diet at Toqua was dominated by white-tailed deer followed in importance by bear and turkey. These animals were occasionally supplemented by elk, bison, small mammals, waterfowl, passenger pigeon, turtles, fish and to a lesser extent by aquatic molluscs.

Status areas for the Dallas occupation at Toqua were defined by their location in the village and their proximity to Mound A and the plaza. High status areas included mounds A and B and the occupation zone immediately adjacent to the plaza, East Village Midden. The low status habitations included West Village and East Village. These determinations were based on the location of West Village, west of Mound A and East Village located some distance from the plaza area. North Village (principally Structure 3) was situated on a small raised lobe of the north side of Mound A. Polhemus (1980, Pers. Comm.) considers this building to have been a special function structure, possibly a men's house. North Village was considered a high status area.

The pattern for butchering and skinning of the deer in the historic and prehistoric samples is essentially the same, although there was a higher frequency of skinning cuts on the metapodials in the prehistoric bone sample. After Euro-American contact, iron knives and axes replaced the stone tools and domestic stock supplemented and eventually replaced wild animals, but the manner in which these animals were processed remained essentially unchanged.

The occurrence of certain pathologies (e.g. porotic hyperostosis) in the late Mississippian human skeletons, coupled with the possible association of these pathologies with a high corn diet, points to an uneven distribution of the necessary amounts of animal protein in the Dallas diet (Parham and Scott 1980). Evidence for differential access to protein along status lines should be represented in the archaeological record by preferred cuts of meat (corresponding bones). The occurrence of certain food species may have been restricted for use by the high status individuals. The evidence for this restriction of the use of a species might include the occurrence of the remains of that species only in a high status area and not in other areas of the site. This proposition was confirmed. The high status groups had access to preferred cuts of meat, such as the front leg of the deer, while the low status people received the skull, shanks and ribcage of the deer. The faunal evidence suggests that the mound inhabitants also had food preferences:

the box turtle and suckers. Waterfowl and passenger pigeon remains were also restricted to high status areas (North Village and East Village Midden). The use of animals such as raptors, mustelids and swans were reserved for the use of high status individuals as probable symbols of their station in the society. Mustelid remains consisted primarily of skull fragments, jaws and metapodials, elements that suggest the use of skins for personal bundles. Mink and weasel remains occurred as burial associations in Mound A and mink and river otter bones were found in North Village and East Village Midden; skunk remains were recovered only from East Village Midden. The raptor remains were found primarily in North Village and East Village Midden; only the remains of a screech owl were reported from Mound A.

The Overhill Cherokee subsistence strategy during the Colonial Period (1746-1775) was based on the white-tailed deer and supplemented by turkey, bear and a variety of other vertebrates and freshwater mollusks (Newman 1977:8; Bogan 1976; 1980). The deer provided a basic meat staple, but the Cherokee also used a wide variety of animals as supplements. The Cherokee had accepted the domestic hog, chicken, horse and possibly the cow by this time (Colonial Period). The chicken would have provided a regular source of protein in the form of eggs and occasionally as a meat item. The hog would have served as a replacement for the deer and bear in the Cherokee diet. The horse was apparently only eaten during times of extreme meat shortage. The cow, although possibly raised by the Cherokee, does not appear in any quantity in the faunal record for this period. The use of Euro-American domesticates would have provided a reliable, easily accessable meat supplement to the white-tailed deer, bear and turkey.

The occurrence of bear, white-tailed deer, pig and raccoon elements from the Colonial Period Overhill Cherokee at Toqua, Chota and Citico were compared and were not found to be significantly different. The faunal samples from the Cherokee features at Toqua and the Citico Colonial Period were extremely similar. However, when the deer and pig remains of these three Colonial Period Overhill Cherokee samples were compared with the Federal Period faunal remains from Citico, all of the Colonial samples were significantly different (p .001) from the Federal Period. Domestic stock played a minor role among the Overhill Cherokee during the Colonial Period, but by the Federal Period they had become very important. The decimation of the local deer and bear populations by the Cherokee for the skin trade and the depredations of the wars with the white colonists forced the Cherokee to accept the domestic stock. The domestic stock had replaced the deer and bear as the Cherokee meat staple by the Federal Period.

The Dallas and Overhill Cherokee inhabitants of Toqua utilized the locally available freshwater mollusks and the prehistoric and historic exploitation of this resource was quite similar. However, the Cherokee appear to have been more selective in the gathering of the meatier species such as the mucket. The aquatic gastropods and bivalves would have provided either a dietary supplement, a source of temper for pottery or lime for preparing corn.

The late Mississippian Dallas pattern of faunal utilization can be contrasted with the generalized historic Overhill Cherokee subsistence strategy. Both groups utilized the same set of physiographic provinces in east Tennessee, so the ecology and endemic faunal assemblages may be considered as constant. The Dallas probably represent a stratified society while the historic Cherokee were an egalitarian society. For the primary meat resources both groups relied upon the white-tailed deer, bear and turkey, supplemented by a variety of other species. The Dallas strategy restricted the individual's access to animal species and cuts of meat, creating in the low status groups a protein deficiency. This is in contrast to the generalized Overhill Cherokee strategy. In the egalitarian society, there were probably cultural patterns requiring meat sharing but principally along immediate family or clan lines. Although uninvestigated, the incidence of protein and iron related deficiencies and bone pathologies should be lower among the historic Cherokee than among the prehistoric Dallas. The introduction of the Euro-American domestic animals, development of the egalitarian society (see Hudson 1976:202-206), introduction of firearms, the pressures of the skin trade and lure of the Euro-American trade items would have had direct and indirect effects on the diet of the Cherokee. The main effect of the introduced domestics would have been the increased availability of meat to all families.

There are some very strong similarities between the Dallas and Overhill Cherokee subsistence strategies, even though the two groups were at different socio-political levels with one, the Cherokee, strongly influenced by Euro-American contact. Both groups relied on basically the same species in similar frequencies as food items. This may be attributed to exploitation of the same territory. Also, the two societies appear to have had similar feelings toward such animals as the mustelids, raptors and vultures. The ethnohistoric and ethnographic literature records the mythological, ceremonial and medicinal roles of these animals.

Prehistorically, among the Dallas, the raptors and mustelids appear to have been utilized by only high status individuals.

Recommendations for Future Research

Faunal samples from the two major cultural groups who occupied Toqua have provided insights into the late prehistoric Dallas faunal utilization and have broadened the understanding of the Overhill Cherokee pattern of faunal exploitation. The patterns of faunal utilization observed in the Dallas deposits at Toqua need to be compared and supplemented with comparable age samples from other Dallas farmsteads and centers. The faunal samples from a continium of sites from the small farmstead, hamlet, secondary and major centers would provide an opportunity to document the differences in the role of animal species within the Dallas culture and possibly document the level at which redistribution of food resources had an effect on the diet and health of the population. This series of sites should also provide an opportunity to compare refuse accumulation patterns in domestic structures.

The Overhill Cherokee subsistence strategy can be further expanded with the completion of the analysis of the excavated faunal samples from Tomotley and Miloquo, although these sites tend to concentrate in the Colonial Period. Faunal samples from several contact period (1710-1745) sites need to be examined as well as those from the Revolutionary Period (1776-1793) and from a Federal Period settlement. Contact and Revolutionary Period occupations are probably present at some of the excavated Overhill Cherokee towns, but have not yet been identified. Federal Period occupations are most likely isolated farmsteads and many should still exist above the pool level of the Tellico Reservoir. These proposed or suggested samples, combined with the excavated and analyzed Cherokee samples, could provide an unique opportunity to carefully examine the process of acculturation and the direction of culture change observable in the historic archaeological faunal record.

One other aspect of the archaeological record which needs to be carefully considered is the patterning of faunal remains in the floor fill of structures. This applies equally to the Cherokee and Dallas animal assemblages. It will be only through careful, controlled excavation of the floor fill of recognized structures in small units that some of the patterns discussed for the Dallas structures will be tested. One method not utilized in this analysis which would provide important information on refuse accumulation and distribution would be the measuring of all faunal remains from the floor deposit. Use of these measurements could document breakage patterns, and the areas toward which refuse was directed. Also, plotting of the anatomical elements of the major food species may be especially informative: providing possible evidence for different treatment of the remains of different food species.

Two other important aspects of the faunal samples discussed here need to be pursued. The distribution of the major food species elements in the Toqua and Chota Overhill Cherokee faunal samples need to be examined for patterns of differential distribution of food items. Did the Dallas pattern of meat distribution persist into the Cherokee period. Also, when the various Dallas features, structures and midden samples are carefully dated, the patterns for Dallas materials documented in this dissertation should be re-evaluated. Do these observed patterns have any time depth or are the observed patterns an artifact of combining samples from different temporal periods?

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