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Who Went to Market?: An Urban and Rural, Late Eighteenth-Century Perspective Based on Faunal Assemblages from Curles Neck Plantation and the Everard Site

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WHO WENT TO MARKET?:
AN URBAN AND RURAL, LATE EIGHTEENTH-CENTURY PERSPECTIVE BASED ON FAUNAL ASSEMBLAGES FROM CURLES NECK PLANTATION AND THE EVERARD SITE

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Susan Trevarthen

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APPROVAL SHEET

This thesis is submitted in partial fullfillment of the requirements for the degree of

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DEDICATION

To my father, who inspired my interests in archaeology, and to my mother, who patiently read and encouraged me through many preliminary copies of my thesis, I dedicate this thesis to them. Their continual support in all of my endeavors will always be appreciated.

I also want to dedicate this thesis to Jim, who patiently listened to my thesis dilemmas even when he had heard them all before and encouraged me through the months of research and writing.

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I am also indebted to Greg Brown in the Department of Archaeological Research in the Colonial Williamsburg Foundation. His knowledge of faunal analysis and computers provided the Foxpro program for the faunal data and the graphs for this thesis.

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ABSTRACT

Animal bones are found on almost every prehistoric and historical archaelogical site. Prehistorians have analyzed faunal material to provide information on early settlement patterns and the domestication of animals, while historical archaeologists and historians have commonly studied bones to better understand the past processes of food preparation and consumption. Besides giving details about past diets, faunal assemblages have more recently been recognized for the data they can provide on the patterns of animal husbandry and the role of the market system on historical sites.

This thesis will investigate the faunal assemblages of the Randolph family at Curles Neck Plantation and the Everard family of Williamsburg. The sites, both dating to the late eighteenth century, will be examined in terms of their archaeological data, historical material, and faunal remains. By examining a rural and urban assemblage, differences and similarities in subsistence strategies can be concluded from the diversity of species and the relative importance of meat cuts. Laws pertaining to the practice of animal husbandry and references to animal rearing in early nineteenth-century farmers' journals will also be used to help define strategies of herd management and the development of the market in the rural and urban atmosphere.

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CHAPTER I

INTRODUCTION

As Marvin Harris points out, "We must know more about food as nourishment, and we must know more about food as profit. Only then we will really be able to know food as thought" (Harris 1985:248). What people eat, when and how often, and with whom are all choices that are not always governed by physiological influences. In order to determine other factors that can affect the patterns of food consumption, faunal analysis, or zooarchaeology, has emerged as an informative subdiscipline of archaeology.

The role of food in society has been studied by many types of scholars. Anthropologists, historians, archaeologists, nutritionists, and sociologists have all examined how the consumption of food can be recognized as a form of patterned behavior. Commonly termed the study of foodways, zooarchaeology has focused on aspects relating to the production, distribution, and disposal of food items. Anthropological approaches to the study of foodways have included the symbolic significance attributed to food preferences and avoidances, as well as the manner of preparation and cooking (Douglas 1966, 1984; Harris 1974,

1985; Levi-Strauss 1969, 1973). The production and distribution of food has served a place in public policy and the political and agricultural economies of the world. Since there is a diversity of food traditions all over the world, there have been numerous ethnographic field studies that have concentrated on reasons why people choose the food they eat.

As part of historical archaeology, faunal analysis has only recently been used to examine the patterns of urban and rural life in colonial Chesapeake. By studying the faunal assemblages of rural and urban households, similarities and differences in the provisioning system, subsistence strategies, and diet can be concluded. Particularly, the diversity of the species, the age profiles of the animals, and the type of meat cuts for each assemblage can provide clues to subsistence methods and patterns of animal husbandry.

In her study of the urban provisioning process, Melinda Zeder examined the production, distribution, and availability of foods in an urban environment. She discovered that there was a direct connection between the type of bones left at a site and the economy that existed between rural and urban communities. In unspecialized economies, the urban inhabitants had direct access to foods being produced in the rural neighborhoods. Due to the small market demand, farmers did not have to follow a specialized form of animal husbandry, which would serve to supply the urban demand. Consequently, the faunal material from urban and rural sites would be

similar to each other, with all elements of the animal being represented (1988).

When urban dwellers no longer have direct contact with the rural farmers, they begin to depend upon the market for their food products. It is in this situation that the economy becomes specialized, as the farmer applies specific forms of animal husbandry to supply the urban demand. Younger animals are sold to the market, while the farmer tends to keep an older and more diverse age group for his own consumption. The bones from an urban site reflect a specialized economy by having a high percentage of "meaty" bones and a low number of "waste parts" (Zeder 1988).

As part of understanding the evolution of human culture, Zeder pointed out that "zooarchaeology goes beyond environmental and dietary reconstruction to approach broader problems pertaining to the operation of complex economies" (1988). One of the most informative investigations concerning the development of complex economies in the Chesapeake is by Henry Miller of the St. Mary's City Commission. In his Ph.D. dissertation, Miller reconstructed the colonization process of the seventeenth-century by examining several faunal assemblages (1984). Using Miller's zooarchaeological perspective combined with other historical sources, researchers have come to a better understanding of how the early foodway patterns developed into the later plantation economies.

The landscape of seventeenth-century Chesapeake was dotted with planters exploiting the land in the production of tobacco and food crops. Tobacco served as a highly lucrative cash crop, while corn was usually raised to fill the requirements of self-sufficiency. These first farms were typically small and were worked by European indentured servants. It was not until the last quarter of the seventeenth century that the importation of slaves gave way to the larger plantations of the eighteenth-century (Walsh 1989).

Throughout the seventeenth-century, planters were also raising livestock in large wooded areas and cultivated land that had already become exhausted of nutrients. Because the raising of livestock was considered a secondary subsistence activity, little care was given for the survival of the domestic animals (Bowen 1991). Although the animals typically flourished in their woodland conditions, the last quarter of the seventeenth century brought a series of severe winters that caused the heavy loss of cattle and pigs in the Chesapeake. This experience led some of the wealthier planters to provide more care and specialized forms of animal husbandry (Gray 1933).

In the early eighteenth-century, the prices of tobacco in Europe had dropped and much of the soils of the Chesapeake had been worn out from the intensive production of this crop. Corn and wheat were added as major cash crops for Chesapeake planters and efforts were made to raise more livestock in

order to produce more manure to fertilize the land (Walsh 1989). This change in agricultural practices also brought changes in the focus of animal husbandry. Some plantation owners began to enclose their fields within fences, thereby developing a more protected pasture system for the raising of cattle, sheep, and pigs (Bowen 1991).

Although the colonial period remained predominantly rural, the establishment of towns in the Chesapeake provided an outlet for planters to vent their surplus crops and stock. The Chesapeake town provisioning systems were complex and the development of their markets was related to the agricultural economy of the local farmers (Walsh 1989). Williamsburg, which was founded in 1699, was no exception as it quickly grew into a cosmopolitan town in the eighteenth-century. Within the town, local merchants were mainly involved in the selling of imported goods such as coffee, tea, wine, spices, and sugar. Other merchants, such as bakers, butchers, and millers served as middlemen by purchasing local food products from the farmers and processing them into items that were sold to the urban buyer. Market days and the marketplace were established early in the history of Williamsburg in an attempt for the merchants, local farmers, and consumers to participate in a market system. Despite the early efforts, many references to the Williamsburg market in the eighteenth-century reveal concerns and complaints about the produce and goods that were offered there. For these reasons, many inhabitants in

eighteenth-century Williamsburg grew their own gardens or raised their own livestock within the city limits. Other urban dwellers had their own plantations or had relatives and friends who owned farms outside of Williamsburg from which they could obtain much of their food necessities (Lounsbury 1986). The close relationship between the rural producer and the urban consumer of Williamsburg suggests that there was a small-scale procurement system that emerged within the context of the countryside.

Within this historical context, the faunal remains from urban and rural archaeological sites can provide insights into how the urban demand affected the production, distribution, and availability of foods in the urban environment. As pointed out in Melinda Zeder's investigation, the choice of meats and types of cuts are clues to the type of provisioning system that existed between urban and rural communities. Other studies concerning the frequency of wild animal bones have revealed another set of differences between urban and rural sites. Elizabeth Reitz's study of southeastern sites has demonstrated that urban sites often yield a wider variety of domestic species while also producing more wild bird species than rural assemblages. The size of the city and the influence of the market system are both factors that can affect not only age profiles but the diversity of wild and domestic animals available to the consumer (1986).

With these ideas in mind, this study will examine an

urban and a rural faunal assemblage from the late eighteenth-century to better understand the role of the market system and the changing practices of animal husbandry. Chapter 2 will provide a synopsis on the procedures and the goals of faunal analysis interpretation, while also demonstrating the biases that can affect a sample. Chapter 3 will introduce Curles Neck Plantation and the Everard site by providing a documentary background and summarizing the archaeological findings that were uncovered at each site. Specifically, the archaeological features from which the faunal material was removed will be described in detail. Chapter 4 will discuss the findings from the analysis of both faunal assemblages, including a description of the animals represented, their dietary importance, the bone element distribution, and the patterns of animal husbandry that were revealed in the kill-off patterns. In Chapter 5, background information on the American Farmer and its editor John Stuart Skinner will be addressed. This chapter will also provide a critical discussion on the use of farmers' journals and the information they can provide in the study of foodways. Early laws, diary accounts, and the American Farmer will be used to discuss the changing animal husbandry patterns of the rural countryside between the seventeenth- and eighteenth-centuries. Chapter 6 will examine the history and the role of the market system in urban Williamsburg. Finally, Chapter 7 will provide concluding remarks by summarizing the role of the urban and

rural community in the late eighteenth-century provisioning system. Specifically, what did the faunal material from Curles Neck and the Everard site add to the interpretation of the Williamsburg market system and what questions still need to be answered?

Chapter II

TECHNIQUES OF ZOOARCHAEOLOGY

The study of animal bones from archaeological sites has become a burgeoning field that is still developing new analytical techniques that will influence how faunal assemblages are interpreted. Initially, the pioneers of zooarchaeology concentrated on producing "species lists" or simply, naming the various species that were represented on an archaeological site. By counting the bone fragments from each specific species, zooarchaeologists attempted to estimate the importance of some animals over others. Fortunately, relying on such qualitative data has come to be recognized as being ineffective and having a high margin of error (Chaplin 1971; Davis 1987).

There are many factors that can influence the condition, the location, and interpretation of faunal remains on an archaeological site. Cultural and environmental variables should be critically studied before conclusions are drawn on the role of animals on a site (Grayson 1979). A well-known example that demonstrates the extreme effects that modifying factors can have on faunal interpretation is the analysis of faunal remains from Fort Ligonier, located between Carlisle

and Pittsburgh. A British relay station during the French and Indian War, Fort Ligonier housed approximately 4,000 men between 1758 and 1766. Historical documents have shown that each man was allotted a daily ration of one pound of meat, but the faunal material uncovered by John Guilday suggests that only 4000 pounds of meat was consumed during the entire period of the fort's use. This would imply that there was either enough meat to feed all the men in the fort for one day or enough meat to feed two men for eight years. These calculations suggest that natural processes affected which bones survived on the site or that the majority of bones and other garbage may have been deposited some distance away from the station (Guilday 1970).

There are many physical, chemical, and biological processes that can modify the appearance of bones and affect the faunal interpretation of an archaeological site. The study of these mechanisms is known as "taphonomy," or the study of environmental phenomena and processes that affect organic remains after death (Efremov 1940). Included in taphonomy studies are seven principle conditions that zooarchaeologists need to consider before interpreting a site; these include biotic, thanatic, perthotaxic, taphic, anataxic, sullegic, and trephic processes (Clark and Kietzke 1967; Gilbert and Singer 1982; Hesse and Wapnish 1985).

Biotic processes refer to the biological conditions of the environment when the site was formed. Specifically,

biotic factors establish the nature and magnitude of the past environment and estimate the availability and seasonality of species that inhabited the site when it was formed (Hesse and Wapnish 1985). While biotic processes concentrate on how living organisms assemble in their environment, thanatic processes focus on how living organisms become deposited in the archaeological context. Basically, thanatic processes examine how the animals were killed and how the bones were accumulated on the site. Although it is common to consider the presence of animal bones as the result of killing by humans, there are numerous other variables that can affect the deposition of faunal material. Non-human predators, disease, starvation, and old age are all examples of thanatic processes that can influence the faunal samples recovered from an archaeological site (Gilbert and Singer 1982; Davis 1987).

Once an animal is dead, there are influencing factors that move and destroy the bone fragments before they are buried. The disarticulation and the differential preservation of skeletal parts are the subjects of perthotaxic processes, which can include butchering and tool use (Gilbert and Singer 1982). Butchering can be performed in a number of ways, depending on the type of bone being butchered, the size of the animal, and the cooking methods being applied. By observing the placement of cut marks, the distribution of the bone elements, and by referring to ethnographic models, archaeologists are coming to a better understanding of the

strategies of meat distribution and consumption (Maltby 1979, 1985). Other perthotaxic processes that can influence the condition of the bones include the gnawing and trampling by other animals, and the selective results of weathering.

Freeze-thaw cycles and the actual chemistry of the soil make up the mechanical and chemical actions of the taphic processes. Determining the taphic processes are helpful to the archaeologist because they can give clues to how the chemical environment of the soil may have affected the preservation of the faunal material (Hesse and Wapnish 1985).

There are also recycling processes that bring the bones from their buried state and expose them to the surface. These conditions, both natural and cultural, are referred to as the anataxic processes. Erosion and the activities of burrowing animals are the most prevalent of the anataxic processes. Humans are also active redepositors, particularly archaeologists, whose very job is to expose the remains of human activity (Gilbert and Singer 1982).

Finally, the procedures of the archaeologists and the zooarchaeologists that can bias the faunal sample are called the sullegic processes and trephic processes. The sullegic processes are influenced by the extent of the study area, the chosen sampling designs, and the methods of actual excavation and removal. The trephic processes are concerned with the curatorial factors associated with the sorting, recording, and reporting of faunal material. Particularly, the identifi-

cation of bones and the presentation of the findings can collectively determine the direction and interpretation of the faunal study (Hesse and Wapnish 1985).

Given the number and the complexity of the varying processes, zooarchaeologists have devised several methods of quantification to help adjust for the differential preservation problems. Each method has its own strengths and weaknesses and its own critics and supporters. Unfortunately, some zooarchaeologists do not consider all the possible approaches to measuring the diversity of a faunal assemblage. This has led to a lack of comparability between sites with faunal material. Singly, each method examines the faunal assemblage on a different level, but when used together, they help to establish a check-and-balance system to faunal interpretations of a site.

At the simplest level, the number of identified specimens (NISP) is used to calculate the relative abundance of any species within a faunal assemblage. After identification, all the bones within each species are added together to determine the frequency of fragments for each animal. The disadvantages of using NISP far outweigh the advantages. The NISP method ignores the fact that some species have more skeletal parts than others, so it often overemphasizes the importance of one species to another. NISP is also very sensitive to bone fragmentation and assumes that all species are affected by fragmentation equally. It does not consider the possibility

that animals may have been butchered away from the site or that some bones do not survive as well as others (Klein and Cruz-Uribe 1984).

The drawbacks to using NISP make it unsuitable as a sole method for faunal interpretations. The most popular method for estimating category abundance has been attributed to T.E. White (1953) and is the statistic method called Minimum Number of Individuals (MNI). While NISP attempts to calculate the maximum number of individuals on a site, MNI most often establishes the minimum number of animals by examining the most common element for each taxon. It provides a conservative approach to estimating the smallest number of animals that are represented in the recovered faunal assemblage. The MNI calculations can be made even more effective if age and sex differences are also carefully considered.

The MNI approach is also not without disadvantages, which can affect analysis of a faunal sample. The method is often considered tedious to calculate and is subject to errors. MNI estimates may not be comparable between faunal samples, depending on the criteria zooarchaeologists use to sort left and right elements and how they treat fragmentary bones in an assemblage. Often, the least common species on a site will be overemphasized when using the MNI approach. Finally and most importantly, MNI values are dependent on the size and the quality of the bone samples, and they do not provide answers

to the specific dietary contributions of an animal. There are two methods involving meat weight that have been used to determine species abundance. The first method, developed by White (1953), is actually a modification of the MNI method. It involves multiplying the MNI figure by a constant meat weight that is assigned to each species. This method helps to correct some of the errors that may occur in the MNI estimates. For example, if only MNIs were considered, one cow may seem less significant than five pigs. When the meat weight calculations are added in, the cow becomes more significant in its dietary contributions.

As with the other methods, White's approach is not without its drawbacks. Taking into consideration that it is based on MNI figures, it is subject to the same margin of error that the MNI method includes. Typically, it assumes that the given meat weight characterizes all members of the species, without considering the seasonality, sex, and age differences (Klein and Cruz-Uribe 1984). Using the previous example in this chapter, one cow might not outweigh five pigs if it is the bones of a calf. The meat weight index is also questioned because it is usually based on the weights of modern animals and does not take into account the changes that have occurred over time. The margins of error are slowly being narrowed as zooarchaeologists, such as Henry Miller (1984), are considering differences in weight that are related to age as well as historical changes.

The second type of meat weight index has been described as the biomass method because it arrives at a percentage of meat weight based on the weight of the archaeological bone. Using the basic formula for allometry, it assumes that any two dimensions of an animal grow at an exponential rather than a linear rate. Body size and body weight can then be determined from the size of a bone element, since a specific quantity of bone represents a predictable amount of tissue. The biomass formulas are fairly new to the techniques of zooarchaeology, and its limitations, such as the varying degrees of bone preservation, are still being examined for their effects on the calculations (Reitz and Scarry 1985).

Another recent innovation in faunal studies--one of the most difficult to interpret--is the significance of element distributions. Since the bones from the same animal may be deposited and preserved in different manners, the distribution of the surviving elements can provide patterns that would otherwise be hidden. Particularly, the distribution of anatomical elements can reveal information on human subsistence, such as butchering methods and food preservation techniques (Maltby 1979; Crabtree 1990). For the purpose of this study, bone distributions are being used to monitor the intrasite and intersite exchange of animal products. If all bone elements are being found on a site, this suggests that the domestic animals were being raised on the site or that the consumers were obtaining whole animals from the producers. If

the consumers are being supplied with selected body parts, there would be a concentration of certain bones, such as the meat-bearing elements (Zeder 1988). By studying the bone distributions found on the Thomas Everard and Curles Neck sites, conclusions can be drawn concerning the subsistence relationship and the role of the market between the rural producer and the urban consumer.

Besides estimating species abundance and importance in faunal samples, age and sex data are also gathered to reveal more about the practices of animal husbandry. Sex differences in animals are often hard to determine unless certain diagnostic features survive. For example, the size and the shape of an animal's canines are typically related to sex differences. Due to the various agents that can affect which bones exist on a site, sexual dimorphic elements do not often exist in a faunal sample. In sum, establishing sex ratios for a sample is a problematic issue in zooarchaeology, an issue that will need to be the subject of future research.

Age at death information, on the other hand, is not as difficult to obtain. Commonly, teeth and the epiphyses of long bones are used to determine the age of an animal at the time of death. Long bones are usually composed of three areas: the shaft (diaphysis), the ends of the bone (epiphyses), and the areas between the shaft and the ends (metaphyses). During various stages of growth, the area between the diaphysis and the epiphyses begin to ossify and

eventually fuse together. The process of fusion has a fairly regular timetable, that varies according to the sex and species type (Chaplin 1971). Like epiphysial fusion, the development of teeth also has a similar timetable that is particular to each species (Grant 1982). Due to the complexity of trying to decipher age from a single tooth, most studies on teeth have only been able to provide broad age distributions.

By recording the condition of the epiphysial fusions and the dental eruption and wear of the teeth, "kill-off patterns," or the age at which an animal died, can be determined for the domestic species of a faunal sample. These patterns can then be interpreted to give clues on animal husbandry patterns and the role of the market system. Sebastian Payne, who has studied kill-off patterns of sheep and goats from Asvan Kale, has stated that there are factors that can affect the age at which an animal is slaughtered. The characteristics of the particular stock of animal and seasonal variations, such as the availability of grazing and feed, can influence the kill-off patterns on a site. Particularly, the purpose for which the animal is raised and the relative value placed upon it can also affect when an animal is slaughtered (1973).

During the late eighteenth-century the patterns of animal husbandry were changing as farmers placed an emphasis on raising animals for profit instead of raising animals for

their own subsistence. Along with the tobacco and wheat, rural producers began to raise domestic animals for wool, milk, and meat, which could have been sold to the local market (Bowen 1991).

As demonstrated by the varying methods of research, faunal analysis requires a great deal of quantifying data. Beginning with identification, the bones are subject to many avenues of inquiry, ranging from questions on age, sex, weight, and frequency of elements found on a given site. With all the diverse approaches also comes a range of biases that can affect each bone element differently. To gain more complete and accurate interpretations of a faunal sample, using a combination of methods would allow for a comparable study. Despite the range of techniques, they all strive to produce data that can be used to help answer questions related to animal husbandry, diet, cooking, butchering, and the environment. When used in conjunction with historic documents, such as probate records, diaries, inventories, and price lists, faunal research can provide additional information relating to topics such as market systems, trade routes, and ethnic studies.

CHAPTER III

AN URBAN AND RURAL PERSPECTIVE

In order to better understand the role of the market in the late eighteenth-century provisioning strategies, two properties were chosen in order to provide both an urban and a rural perspective. The families who owned each property are fairly comparable in terms of status and income. The Everard property, located in Williamsburg, and the Randolph plantation of Curles Neck are documented properties of Virginia that have been the subjects of recent archaeological excavations. For the purpose of reflecting on the similarities between the properties, this chapter will provide a brief synopsis on the background of each family, their social position in the late eighteenth-century, and the history of the property itself. Specifically, the archaeological excavations will be addressed and the type of features where the faunal material was uncovered will be discussed.

THE HISTORY OF CURLES NECK

The faunal material from Curles Neck Plantation, the land of Richard Randolph II, was studied and compared with Williamsburg's Everard site. By studying a rural assemblage and comparing it to an urban site, differences in the

diversity of animals, age profiles, and skeletal parts should reveal differences in subsistence strategies that existed between rural producers and urban consumers.

Since 1984, archaeological work has been conducted by the Virginia Commonwealth University Archaeological Research Center to uncover clues that reveal the history of the Curles Neck property. Located on one of the peninsulas off the James River in Henrico County, the 750 acres of land are historically known to have held the sites of two plantations. The first plantation belonged to Nathaniel Bacon, Jr., who is best known for his personal civil war against British authority in 1676. The second plantation, which is the subject for this thesis, initially belonged to William Randolph in 1600 and was consecutively handed down to three generations of Richard Randolphs (Mouer 1990).

William Randolph, who came to Virginia in the mid seventeenth-century, had established a small farm by 1676. He acquired Turkey Island and purchased the Bremo patent, so that by the 1690's he owned most of the east portion of the Curles Neck tract. Due to his close friendship with Governor Nicholson, Randolph was appointed as the colony's escheator general, in charge of taking any land in which the owners had failed to pay their taxes or meet the conditions of their patent. Among one of the properties in question was the estate of Nathaniel Bacon, Jr. Randolph ordered a coroner's inquisition in 1698 to confirm that the Curles lands,

previously owned by Bacon, had become property of the crown. With back taxes to pay on the property, Randolph added the Curles Plantation and the Slashes Plantation to his expanding land holdings along the James River. He married Mary Isham of Bermuda Hundred in 1680 and fathered nine children before he died in 1711; and before his death, he ensured that his six sons would each receive fully stocked plantations on which to raise their families (Mouer 1988a).

Richard Randolph I, who acquired Curles in 1715, was the fifth son of William Randolph. Richard married the great-granddaughter of Pocahontas, Jane Bolling, in 1689 and became the commanding officer of the Henrico militia. He also served as the colony's treasurer, the church warden, and in time, he inherited his father's positions as trustee for the town of Bermuda Hundred and later, for the town of Richmond. Little is known about the personal lives of Richard and Jane Randolph, except that they seemed to have been great supporters of the church, as demonstrated by their donations of land, labor, and materials to build a parish chapel for Henrico called Curles Church. Richard also donated labor and materials to build a replica of Curles Church for a new parish in Richmond. Richard Randolph I died in Bath, England, but he left more than 80,000 acres of land to be divided among his male children. The fate of Curles plantation was left in the hands of Richard Randolph II, the eldest son, who also acquired his father's military, political, and religious

positions within the colony (Mouer 1988a).

Richard Randolph II married Anne Mead of Nansemond County and continued to play a large role in the Henrico vestry and the House of Burgesses as thoughts of a Revolution began to be discussed in the Virginia government (Weaver 1987). Although he served as a representative to the Virginia conventions, it is believed that his moderate views as an older established planter caused him to lose his seat in the House of Burgesses. When he died in 1786, he left his children all of his vast land holdings, as well as his vast debts (Mouer 1988a). The Curles Neck property was once again handed down to the eldest son, Richard Randolph III, who was the least known of all the Richards. He lived most of his adult life in Richmond, while the Curles land passed back and forth between different owners.

Although there are wills and historical accounts that have provided details for the history of the property, there is little information about the Randolphs' plantation strategies of the eighteenth-century. The wills that exist provide only general information, and the Randolphs did not produce any probate inventories or diaries that would provide clues to their animal husbandry techniques. For this reason, this study must rely on the animal husbandry patterns of other eighteenth-century plantation holders and the faunal assemblage itself to draw conclusions about the rural contributions to the market economy.

THE ARCHAEOLOGICAL EXCAVATIONS AT CURLES NECK

The Curles Neck site has been studied by the Archaeological Research Center of the Virginia Commonwealth University since 1984. Within the first five years of the Curles site investigations, thirty-four individual seventeenth- , eighteenth- , and nineteenth-century structures were identified (see figure 1). One of these structures was excavated in 1988 and is associated with two trash deposits that contained a large number of faunal material. The structure was a fifty-four foot by twenty-two foot brick building, which is believed to have been constructed around 1700. Between 1720 and 1740 it became a kitchen when the Randolph mansion was being built. A sixty foot collonade was also constructed to connect the kitchen to the mansion, a dairy, and a twenty foot square brick ice house. The kitchen and the terrace it was built on are shown on an early insurance plate. This building remained standing until the Civil War when it was dismantled by Federal troops (Mouer, personal communication 1992).

The faunal material associated with the kitchen was found in a well and within the walls of an eight to ten foot structure believed to have been either an ice house or a meat house. The ice/meat house was excavated into the fill of Bacon's house during the early to mid eighteenth-century and was abandoned by the end of the eighteenth-century and filled with kitchen trash. The well was uncovered in the northwest

Curles Plantation Site, Henrico Co., Virginia

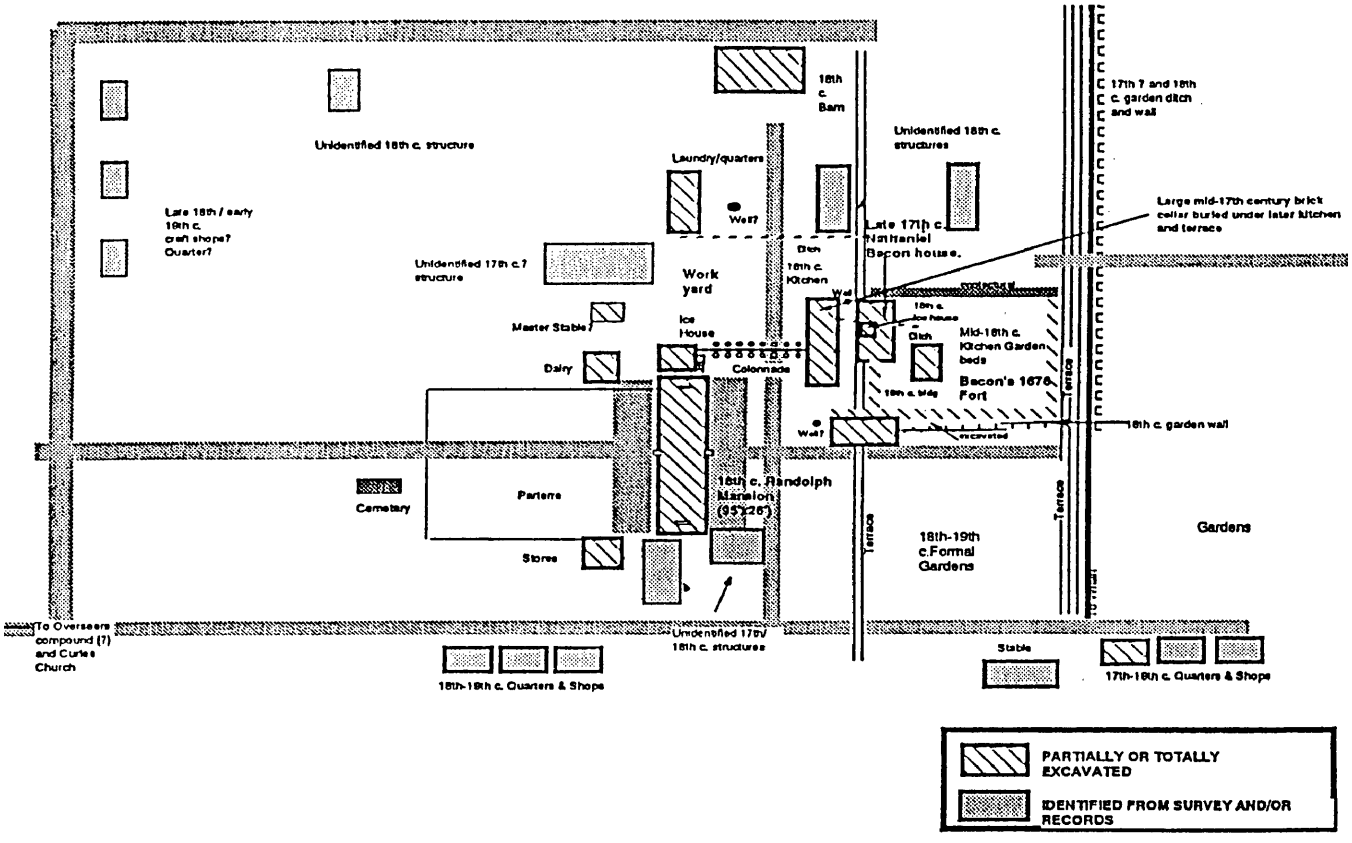


FIGURE 1

corner of Bacon's house and appears to be contemporary with the Randolph kitchen. Ceramic and bone crossmends between the ice/meat house and the well suggest that they were filled in at the same time. Evidence from the artifacts indicate that the fill from the features dates from the third and fourth quarters of the eighteenth-century and could possibly represent the refuse from middens that had accumulated around the kitchen throughout the 1700's (Mouer, personal communication 1992).

THE HISTORY OF THE EVERARD PROPERTY

The Brush-Everard property in Colonial Williamsburg was chosen in order to understand how the process of urbanism affected the production of animals in the rural areas, the availability of animals in the urban centers, and the strategies of the urban provisioning system. It was during the latter half of the 1700's that Thomas Everard became owner of the land known as Lots 165 and 166. Everard was not a native of Virginia, but came from England in 1734 to begin an apprenticeship in the Secretary's Office in Williamsburg. Everard's political and social prestige can be measured as he rose from local office positions, such as the Clerk of Elizabeth City County and the Clerk of York County, to positions that were on the county and colony level, such as Mayor of Williamsburg in 1766. While maintaining his position in politics, he also managed to retain his role as a planter

who farmed land both in James City County and in Brunswick County. His combined success as a politician and a planter must have played a large role in also ensuring his upper social status (Samford 1990).

With his increased success, Everard was able to move from his initial residence on Nicholson Street to a tract of land on the Palace Green. Surrounded by neighbors such as George Wythe, Robert Carter Nicholas, and the Governor of Virginia himself, Everard found himself among the colony's most influential residents.

Many renovations to the property seemed to have been accomplished during Everard's years of habitation on Lots 165 and 166. Additions to the main house, the laundry, and the kitchen have given clues that Everard needed increased living space for the large number of slaves that were living on his property (Samford 1990).

Other renovations that reflect his financial success included the elaborately carved staircase placed in the front hall, fine paneling in the stair hall, cornice moldings, carved chair rails, and fireplace surrounds. All of these features were part of the public space of the Everard household and were meant to be seen by visitors (Samford 1990).

In terms of Everard's subsistence strategies, there are clues to his practices of animal husbandry left in the documents and archaeological records. In 1773, Everard traded

one-and-a-half acres of land east of the Palace for a half acre lot that adjoined his own property. Archaeological investigations in 1947 revealed that an artificial pond had been constructed on this lot in the eighteenth-century. Due to the irregularity of its shape, the pond and surrounding land may have served as a pasture and water source for his livestock (Samford 1990). It is known that Everard kept livestock on his in-town property because he frequently advertised for missing horses and cattle in the Virginia Gazette (Virginia Gazette August 16, 1770, September 27, 1776, November 23, 1769). Since he kept cattle and horses at his home and he built an artificial pond, it is not inconceivable to think that he was also raising domestic fowl, including ducks, geese, and chickens.

In addition to his urban property, Everard was also taxed for 600 acres of land in James City County and for 1,136 acres in Brunswick County in 1768 (Samford 1990). It is likely that both plantations produced livestock and may have been the major food suppliers for Everard. Combined with his in-town property and his access to the market system, Everard had several sources that made up a complex provisioning system.

THE ARCHAEOLOGICAL EXCAVATIONS AT EVERARD

Archaeologically, the Everard ravine deposits have provided a great deal of information on the personal items related to the household. Excavations directed by Patricia

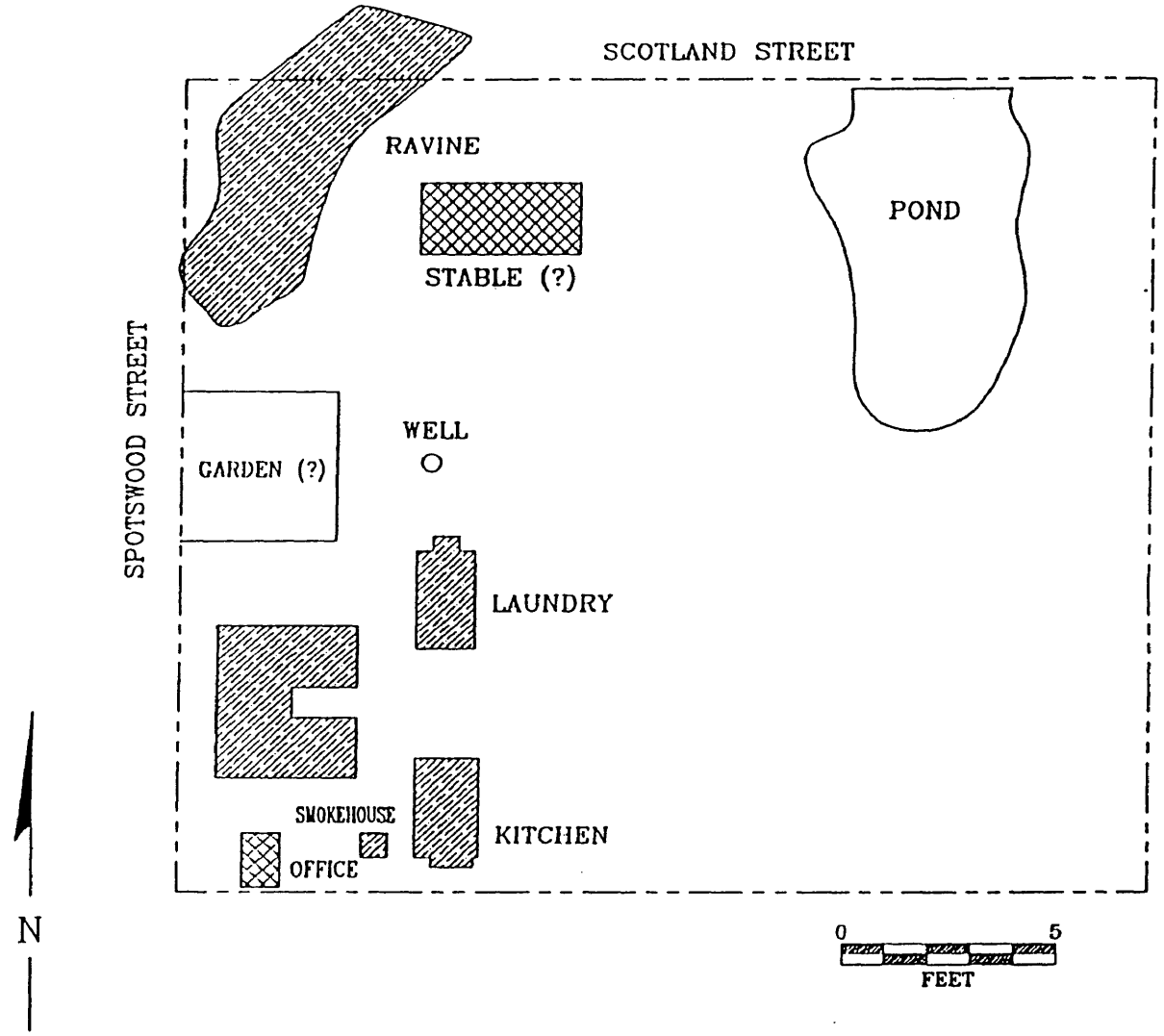
Samford in 1987 and 1988 have revealed that most of the ravine deposits were kitchen and food related debris, particularly animal bones, which were found in relation to deposits of ash (see figure 2).

Found in association with the faunal material and the ash layer were numerous other artifacts. It is important to consider these artifacts because archaeologists are able to date the deposition of archaeological assemblages by knowing the beginning manufacture dates for ceramics and glass. The major layer of ash that seems to have been deposited between 1750 and 1770, contained 288 vessels, another ash layer, containing 139 ceramic items was laid in the 1770's. There are few differences in the ceramic vessels of the two layers. As Patricia Samford points out, the only visible difference is a slightly higher concentration of teawares in the second deposit. There was also a decrease of pharmaceutical jars and pots in the later deposit, which may reflect the death of Everard's chronically ill daughter, Francis Everard, in 1773 (Samford 1990).

Predominate in the vessel counts for both ash layers were delft plates. Other tablewares included feather edged creamware plates and Chinese porcelain plates. Lacking in the Everard assemblage are any large amounts of white saltglaze stoneware tablewares. Although white saltglaze became common after 1740, Everard's white saltglaze vessels are mainly teawares and other drinking vessels (Samford 1990).

BRUSH–EVERARD PROPERTY circa 1775

Thomas Everard Period



Known locations of buildings

Locations of buildings probably standing in 1775

FIGURE 2

Archaeological evidence suggests that around 1770 Everard began to fill in his ravine so that the area could be leveled with the rest of his property and be used for other purposes. When he filled in the ravine, Everard sealed a time capsule that would not be opened for over two hundred years. By carefully examining the faunal remains of Everard's trash ravine, and knowing the personal level of the household and its available resources, it should be possible to see if the market system played a role in the changing times of the late eighteenth-century.

CHAPTER IV

THE FAUNAL ANALYSIS

All of the 6,383 bones that were excavated on the Everard property were taken to the Zooarchaeology Laboratory of the Department of Archaeological Research in Colonial Williamsburg, where they were processed and identified by Dr. Joanne Bowen and Elise Manning. This number also includes the 314 identifiable bones that were recovered during wet screening of soil samples from the Everard site. The Curles Neck faunal material was taken to the Virginia Commonwealth University Archaeology Laboratory, where they were washed and numbered. When Dan Mouer, Director of VCU's Archaeology Department, was contacted about the use of their faunal material, the 2,244 bones were collected and taken to Colonial Williamsburg's Zooarchaeology Laboratory, where they were analyzed by the author under the supervision of Dr. Joanne Bowen.

METHODS

The initial processing phase of analyzing the Curles Neck bones included sorting the faunal fragments into identifiable and unidentifiable components. The unidentifiable group was

then sorted further into broad taxon groupings such as bird, fish, small mammal, medium mammal, and large mammal. Finally, within their taxon groupings, the bones were sorted into broad element categories such as long bones, teeth, ribs, and skull fragments. All of the unidentifiable bones were then counted, weighed, and recorded on the computer. In total, there were 1,310 unidentified bones in the Curles Neck assemblage, which is 58.6% of the total bone count. In comparison, there were 4,433 unidentified bones from the Everard faunal material, which make up 69.5% of the total bone sample.

The computer program that supplies the total for the bone count and stores the faunal material was developed by Dr. Joanne Bowen and Greg Brown of Colonial Williamsburg's Department of Archaeological Research. Based on a custom Foxpro database program, the system allows for each bone to be entered according to its unique bone number along with additional information such as taxon, element, symmetry (side), location, weight, fusion state, tooth type and wear, relative age, butchering techniques, and evidence of burning, weathering, and chewing. Once the data are entered, the computer can then manipulate the information and provide calculations and percentages concerning bone size, bone frequency, and kill-off patterns.

Each of the identifiable bones was numbered with a "unique bone number," sorted into taxon groupings, and then identified with the use of the comparative collections found

in the Colonial Williamsburg Zooarchaeology Laboratory and the Smithsonian's Department of Birds and Herpetology. There was a total of 934 bones (41.4%) identified in the Curles Neck assemblage and 1,950 bones (30.5%) identified from the Everard property. Of the identified bones, it was determined that over twenty different taxa were represented in the Curles Neck faunal assemblage and over forty different species were found at the Everard site (Tables 1 and 2).

The next three sections of this chapter will cover the three main variables that zooarchaeologists have focused on when studying urban and rural assemblages. The first variable is concerned with the range of species for each assemblage and the relative subsistence importance of each animal. Second, the kill-off profiles are studied for information they can reveal about the animal husbandry patterns in the rural and urban communities. Third, the exchange of animal products between the urban and rural sites can be monitored by looking for differences in body part distributions for the main domestic species (Crabtree 1990).

IDENTIFIED TAXA

Variability in the diet can be partly measured by the overall range of animal species identified in an archaeological assemblage. Based on other faunal studies, observations have been made about the differences between urban and rural sites. In Reitz's investigations of eight-

CURLES NECK IDENTIFIED TAXA

Domestic Mammals
- Cow
- Pig
- Sheep/Goat
- Horse
- Dog
- Cat

Wild Mammals
- White-Tailed Deer
- Raccoon
- Eastern Cottontail
- Black Bear

Domestic Birds
- Chicken
- Turkey
- Domestic Duck/Mallard
- Domestic Goose

Wild Birds
- Common Merganser
- Common Goldeneye
- Grouse/Partridge
- Pheasant
- Bald Eagle
- Robin

Fish
- Bony Fish
- Sturgeon
- Gar
- Catfish

Reptiles/Amphibians
- Bullfrog
- Snapping Turtle
- Box/Water Turtle
- Slider/Cooter
- Red-Bellied Turtle

TABLE 1

EVERARD IDENTIFIED TAXA

Domestic Mammals
- Cow
- Pig
- Sheep/Goat
- Cat
- House Mouse
- Old World Rat

Wild Mammals
- White-Tailed Deer
- Eastern Gray Squirrel
- Opossum

Domestic Birds
- Chicken
- Turkey
- Domestic Duck/Mallard
- Domestic Goose

Wild Birds
- Canadian Goose
- Dabbling Duck
- Grouse/Partridge Pheasant
- Pochard
- Ruddy Turnstone
- Bobwhite

Fish
- Bony Crab
- Sturgeon
- Gar
- Catfish
- Bony Fish
- Atlantic Cod
- Perch
- White Perch
- Striped Bass
- Temperate Bass
- Porgy
- Sheepshead/Sea Bream
- Scup
- Croaker/Drum
- Black Drum
- Red Drum
- Sunfish

Reptiles/Amphibians
- True Frog
- Slider/Cooter

TABLE 2

eenth- and nineteenth-century faunal assemblages from the southeast, the urban sites reflected a more restricted range of wild mammals than their rural counterparts (1988).

Zeder concluded in her studies of Near Eastern communities that urbanites were provisioned with an increasingly limited range of animal species as the markets became more specialized and the consumer became more distant from the rural producers. The urban assemblage would reflect this by containing a high proportion of remains from a relatively small number of species (1988).

In light of Zeder's and Reitz's different observations from two distinct regional areas, the following sections of this chapter will briefly discuss the various species found on each site while also distinguishing the relative dietary importance of each animal through the kill-off patterns and element distributions. The differences between the Everard and Randolph sites will be compared to the differences between Zeder's and Reitz's examinations of urban and rural faunal assemblages, in an attempt to discern the position of the urban consumer and rural producer in eighteenth-century Chesapeake.

Domestic/Commensal Mammals

One of the major food sources found on both sites was the domestic pig (Sus scrofa). Previously believed to have been the primary food of the South during the seventeenth- and

eighteenth-centuries, recent archaeological data has suggested that beef may have been more important (Bowen 1986, 1991). Although the ranking of pork among colonial foods may be argued, it is known that pigs were animals that required little maintenance and an unspecialized diet. Typically, they were slaughtered during the late fall, and any extra meat was salted, pickled, or smoked. They proved to be a profitable income to farmers since 65-80% of their body weight could be utilized and sold at the town markets (Reitz 1979). Since many towns began passing laws in the early eighteenth-century that prevented pigs from being raised in the city limits, the animals were predominantly raised on plantations and farms.

The domestic cow (Bos taurus), on the other hand, was allowed to be kept in the city limits. Also found on both sites, they were mainly raised on nearby farms, although there were some urban dwellers in Williamsburg, including the Everards, who were known to have kept cows on their property (Samford 1990). These urban animals may have been used for obtaining fresh milk, meat, butter, and cheese, in addition to the products obtained from the local town market. Around 50-60% of a cow's body weight could be used for edible meat, which loosely translated, means that typically 400 pounds of meat could have been used from a mature cow in the eighteenth-century (Miller 1984). Butchers, who depended on selling their wares at the market, would often buy entire cows from nearby plantations and then slaughter them for their urban consumers

(Brown 1989).

Sheep (Ovis aries) and goats (Capra hircus), also found on both sites, are lumped together in zooarchaeological analysis since their skeletons are almost identical. Both animals were usually kept on farms and plantations and were not considered as profitable as the pig and cow, due to their inability to defend themselves and their low reproduction rate (Reitz 1979). Sheep were predominantly raised for their wool, but were also raised as a food source (Walsh 1989). As more detailed studies are performed on the Everard and Randolph assemblages, it may be possible to differentiate between the sheep and goats, ultimately indicating the dietary importance of the two.

Similar to the sheep/goat category, horses (Equus cabellus) and asses (Equus asimus) are lumped together in the same grouping. Found on both sites, they were probably used for draft purposes as opposed to food. It is known that horses were brought to the New World by the Spanish and became the major work animal of the colonies. Horses were commonly found in the vicinity of towns as well as plantations. In fact, on the Draper site of Williamsburg, a horse burial pit was discovered on the northern side of a pasture that included the articulated remains of two animals. These remains included an almost complete skeleton of an adult horse aged four to five years and the hindquarter of a younger horse about three-and-a-half years old. There were no signs that

the meat was removed from the bone or that the animals had been diseased; there are no answers to why the animals were deliberately buried (Brown 1989).

Both Curles Neck and the Everard sites contained bones belonging to domestic cats (Felis domesticus), but only at Curles were the bones belonging to a domestic dog (Canis familiaris) discovered. The bones of cats and dogs are frequently found in colonial assemblages, but they are typically not considered evidence of food remains.

Animals which live in close proximity of humans, but which are not necessarily considered domestic, are termed commensal animals. Usually inhabiting attics, cellars, and rubbish piles, commensal animals, such as mice and rats, were not typically used as a source of food. Bones from the Old World rat (Rattus spp.) and the House mouse (Mus musculus) were found in the wet screen material of the Thomas Everard assemblage, while none were found in the Curles Neck sample.

Wild Mammals

When the early settlers came to colonial Virginia, they wrote back to their families and friends that the new land was overflowing with various birds, fish, and wild game. Although there was much wildlife in early Virginia, within a few years the colonists were subsisting mainly on the domestic animals they had imported. Reasons for this switch in subsistence are still being researched, but it may relate to a change in

taste. By the eighteenth-century, individuals of wealth and status were not serving exotic dishes of wild animals, but preparing pork and beef in new and elaborate presentations (Bowen 1991). If anyone was still eating a large amount of wild species, it would seem reasonable that individuals in the rural communities would have more access to them; but as the Curles Neck assemblage will show in terms of pounds of usable meat, there is not an overwhelming concentration of wild mammals.

Faunal material from the native white-tailed deer (Odocoileus virginianus) represents the only wild animal that both assemblages had in common. Deer were plentiful in Virginia, as they are today, because they were able to exist in a variety of habitats, such as farmlands, woods, and swampy surroundings (Whitaker 1980). Venison was served in the taverns of Williamsburg and also may have been prepared in private homes, considering that Thomas Everard ordered a "Venison Pastry Pan" from London in February, 1773 (Noel Hume 1978). Although venison may have been available in the town markets, urban residents might have also acquired venison by hunting deer in the surrounding woodlands. In 1739, the botanist John Clayton described various Virginia field sports and included his account of deer hunting:

> Now the Gentlemen here that follow the sport place most of their diversion in Shooting Deer: w'ch they perform in this manner they go out early in the morning and being pritty certain of the place where the Deer frequent they send their servants w'th dogs to drive'em out and so shoot'em running.

(Virginia Historical Magazine vol. 7).

Other wild animals found on the Thomas Everard site include the Virginia opossum (Didelphis virginiana) and the eastern gray squirrel (Sciurus carolinensis). Opossums are known for their activity at night and for their frequenting swampy areas that are common along the shores of Virginia. William Hugh Grove described the meat of the opossum in 1732 as "resembling Hog flesh, exceeding fat and Lusious" (Virginia Magazine of History 1977).

Squirrel, on the other hand, was a dish that was prepared in a number of ways. Typically found in forests and urban environments, the meat from squirrels was often served boiled, in stew, or barbecued (Noel Hume 1978). Demonstrating the popularity of the dish, Francis Taylor wrote in 1787, "Cousin Zachary G. Taylor and myself rode to Courthouse, heard there was to be a Squirrel Barbecue at Capt. Woods Spring some of the party invited us and we went and dined ther..." (Barnett and Gilliam 1989).

At Curles Neck, it seems that the Randolph family were utilizing other types of wild species, including the raccoon (Procyon lotor) and the eastern cottontail (Sylvilagus floridanus). Like the opossum, the raccoon is also a member of the nocturnal family that prefers its habitat to be along wooded streams. "Coon hunting" is a popular sport today, as it may have been in the eighteenth-century, and the meat has been compared to that of lamb (Whitaker 1980).

The eastern cottontail is known to have been a common dish on the dinner tables of colonial Virginia. Although their bones are not frequently found in faunal assemblages, a mid eighteenth-century well deposit at Carter's Grove provided the remains of no fewer than forty-four cottontails (Noel Hume 1978). The cottontail is usually found in brushy areas, cultivated fields, and woods, so the area around Curles Neck plantation must have been a perfect habitat for them (Whitaker 1980).

The largest and most unique wild animal represented in the Curles Neck assemblage is the black bear (Ursus americanus). Identified by the fragments of a single femur bone, it is presently the only bear bone to have been found on a late eighteenth-century site in Virginia. Weighing up to 600 pounds, the black bear still prefers its habitat to be in thick forests and swamps. At the beginning of the eighteenth-century a European visitor to Virginia described that "Bears are found in large numbers. They are not vicious, hence they are shot without fear" (Virginia Historical Magazine, vol. 24). It has been commonly believed that by the late eighteenth-century, most of the black bear population had been pushed out of the lowlands towards the Blue Ridge mountains of Virginia. It is not certain whether the identified bear was killed near the swampy areas of Curles Neck plantation or killed on a mountain hunting expedition; but what is known, is that the bone shows definite evidence of butchering.

The meat of black bears was and still is considered quite tasty, and the hunt for them has been a sport for many years. It is interesting to note John Clayton's description of bear hunting and the advantage that the hunters had:

> Yet the Common Sort of People who live among the Mountains kill great Quantitys of Bears every year; but the greatest destruction of 'em is made in the beginning of the Winter when the bears lay themselves to sleep in the caves and holes among the rocks of the mountains at w'ch time the people go to the mouth of the Cave w'th their guns loaded and shoot'em as they lye in their dens (Virginia Historical Magazine, vol.7).

Domestic Birds

Besides mammals, there was also a vast assortment of both domestic and wild birds, which played a considerable role in the eighteenth-century diet. Representing the domestic fowl in both assemblages were chickens, turkeys, ducks, and geese.

Chickens (Gallus gallus) were probably found on most rural and urban properties in the colonial period. They were easy to raise and, though often kept in hen houses, they were also allowed to roam free. The chickens and their eggs were prepared in a number of ways: roasted, boiled, fried, broiled, and minced (Noel Hume 1978). Chickens of the late eighteenth-century weighed around two-and-a-half pounds (Miller 1984).

Turkeys (Meleagris gallopavo) are the largest gamebird found in the open forests of North America, but they have also been successfully raised in domestic surroundings (National Geographic Society 1983). Unfortunately, there are virtually

no skeletal differences between a wild and a domestic turkey, so for faunal analysis purposes, all turkey bones are grouped under the domestic bird category (Dr. Joanne Bowen, personal communication, 1991).

In 1770, John Norton commented on the "monsterous Goose Pye" that was to be served for dinner (Barnett and Gilliam 1989). Although it was not served as often as chicken, the domestic goose (Anser anser) was raised for its meat, eggs, and feathers (Noel Hume 1978). It was a large bird in comparison to the domestic duck (Anas platyrhynchos), which is very similar in appearance and skeletal form to the mallard. Domestic ducks were kept near ponds or streams and have been found on other sites dating to the late eighteenth-century. For example, on the John Custis property in Williamsburg, mallard skulls were found in a well deposit dating from the 1780's (Noel Hume 1978).

Wild Birds

Due to their proximity to the Chesapeake Bay region, both Thomas Everard and Richard Randolph had access to a wide range of wild fowl. The Chesapeake Bay area makes up a portion of the Atlantic Flyway, which serves as the migratory path for millions of birds each year. While some wild species use the marshy regions to rest during their migrations, other birds choose to spend the whole winter in the area. In fact, today the Chesapeake Bay is home to more than 380 species of bird,

some of which were discovered in the assemblages (Miller 1984).

Varieties of wild duck make up the largest amount of migratory birds in the Chesapeake area. Mainly surface feeders or dabblers, these ducks generally feed on material found twelve to eighteen inches below the surface of the water (Miller 1984). In the Curles Neck assemblage, two wild duck species were found. One, the common goldeneye (Bucephala clangula), is also referred to as the "whistler" because of the loud noise it produces when flying (Bull and Farrand 1977). The other duck, the common merganser (Mergus merganser), is frequently found along the lakes and rivers of the southern United States (National Geographic Society 1983). The Everard material had several wild duck bones that could only be identified to genus: dabbling duck (Anas spp.) and pochard (Aythya spp.). The dabbling ducks frequent shallow ponds and marshes, and feed from the surface by upending their bodies to grope for food on the pond bottom. The pochards, on the other hand, are diving ducks who swim for their food and typically live in deep lakes (Mitchell 1988).

The Everard assemblage also included bones from a Canada goose (Branta canadensis). Preferring open estuarine bays and marshes, the Canada goose is one of the largest migratory birds that spends most of the winter along the Chesapeake bay (Miller 1984).

Another wild bird, identified in the Everard group, is

the ruddy turnstone (Arenaria interpres), which prefers the habitat of the coastal beaches and rocky shores. Feeding on small marine animals and insects, the ruddy turnstone uses its short, pointed bill to turn rocks and other objects in search for hidden prey. Found along the coasts of America and Europe, it is not surprising to find it on a site so close to rivers that lead to the bay (Pope 1990).

Bobwhites (Colinus virginianus) and ruffed grouse (Bonasa umbellus), small game birds that were often hunted during the colonial period, were identified in the Everard assemblage. Bobwhites usually gather in coveys of roughly two dozen birds when it is not the breeding season. They are very territorial and often can be identified by their distinctive voice coming from pastures, farmlands, and grassy roadsides (Bull and Farrand 1977). The ruffed grouse, on the other hand, is a bird that usually travels as a single male or female with his or her young.

Finally, an American robin (Turdus migratorius) was uncovered at Curles Neck. Commonly found in both wooded areas and urban environments, the presence of this species probably presents an accidental death rather than evidence of a food source (National Geographic Society 1983).

Fish

Due to their fragility and size, the bones of fish sometimes do not survive on archaeological sites, or they are often easily overlooked. When comparing the two assemblages, there are a greater number and variety of fish species represented in the Everard material. Many of the fish bones on the Everard site were discovered during the wet screening process that was performed on some of the Everard soil. In either case, both sites were positioned near areas that were productive for catching fish. The Chesapeake and its adjoining waters make up one of the most resourceful estuarine systems in the world. The rivers and streams provide necessary nutrients that are needed to support the variety of flora and fauna in the Bay (Miller 1984).

One of the larger species of fish found on both sites is the sturgeon (Acipenser spp.). Identified by their bony plates and scutes, sturgeon are classified as anadromous fish because they spend most of their life in the Atlantic but must return to spawn in fresh waters such as the James River, the York River, and the Rappahannock River (Lippson and Lippson 1979). Due to intense commercial fishing, the sturgeon has become a rare sight in the Chesapeake Bay and its contributing rivers (Hildebrand and Schroeder 1972).

Sturgeons are considered slow-growing, long-living fish that mature between twelve and twenty-two years and may reach an age of seventy-five years. Although there are seven

species that are known to exist in the United States, only two can be found in the waters of Virginia. The Atlantic sturgeon (Acipencer oxyrhynchus) has been measured up to about twelve feet and has been known to weigh over 100 pounds, while the lighter shortnose sturgeon (Ancipenser brevirostrum) usually does not exceed three feet (McClane 1965).

The sturgeon is mentioned in early American history and throughout the eighteenth-century as a popular source of food and export products. Their black roe was made into caviar, their meat was smoked as a delicacy, and their bladders were used in the making of isinglass, a natural gelatin (Wharton 1957).

The gar (Lepisosteidae spp.) belongs to an ancient group of predatory fish that are distinguished by elongated, cylindrical bodies that are covered with diamond-shaped scales. Found on both sites, they are also noted for having long beaklike jaws that contain sharp teeth of various sizes (McClane 1965).

Only one species, the Longnose Gar (Lepisosteus osseus), is reported to still exist in the waters of the Chesapeake Bay. This gar can reach a length of six feet and may have once been a common sight in the waters of the James River. (Hildebrand and Schroeder 1972). Today, this fish is not considered a good fish to eat, although its remains are frequently found in prehistoric and colonial faunal assemblages.

The catfish (Ictaluridae spp.), on the other hand, was and still is praised as a fine fish for eating. A bottom dweller, the catfish is another member of the fish family uncovered at Curles Neck and the Everard property. There are many species of the catfish family, and they inhabit a variety of environments in both fresh and salt water (McClane 1965). They are still considered a fine fish to eat due to their lack of small bones (Noel Hume 1978).

The remaining fish species that will be discussed in this chapter were found only in the Everard assemblage. The largest percentage of these fish were the white perch (Morone americana) and the striped bass (Morone saxatilis) which both belong to the family of temperate basses (Family Percichthylidae). These fish are classified as semianadromous species because they are mainly estuarine, but they migrate from the Bay to spawn in fresh waters (Lippson and Lippson 1979). Both are considered popular sport fish with the white perch having a slightly heavier body than the striped bass (Herald 1972).

Representing another family in the fish faunal material were the croakers and drums, which include about 160 species. On the Everard property only the red drum (Sciaenops ocellatus) and the black drum (Pogonias cromis) were identified. The red drum, sometimes called the redfish or channel bass, has been caught at a record weight of eighty-three pounds, but typically averages about eighteen pounds.

They are found along the east coast from Massachusetts to Florida in surface schools (Herald 1972). The black drum prefers the habitat of bottom dwellers, living on worms, mollusks, and crustaceans (Miller 1984). During the colonial period these fish were valued not only for food, but also for their proposed medicinal purposes. It was believed by some that the "jelly-like" material found in the head could be dried, beaten, and then used in broths to help women in labor (Noel Hume 1978).

Species of the porgy family (Family Sparidae) found in the Everard bones include the scup (Stenotomus chrysops) and the sheepshead (Archosargus probatocephalus). Members of this family are deep-bodied fish, which are usually equipped with powerful incisor teeth and strong molars. American species are generally less than two feet long but are considered valuable as a food source (Herald 1972). Today, scup are common in the Bay, but the sheepshead which were once a frequent sight in the colonial period are a rare fish among the jetties and pilings (Hildebrand and Schroeder 1928).

The Atlantic cod (Gadus morhua) was, and still is, a popular fish to eat since they can be dried and salted. In 1791, Thomas Jefferson reported to Congress that cod fisheries had been in existence since 1517 off the banks of Newfoundland, but those established in New England in the beginning of the seventeenth century surpassed all other cod fisheries in the world. They accounted for well over 100

million pounds of cod each year (Wharton 1957).

The Atlantic cod is the largest species in the family and is predominantly found on the bottom of cold to temperate waters. They can reach a maximum weight of 211 pounds, but they are typically caught commercially at two to twenty-five pounds (Herald 1972). Since they are not native to the local waters around Williamsburg, it can be assumed that the Everards probably purchased the cod from a local merchant or the Williamsburg market.

Finally, the last family of fish identified was the sunfish (Family Centrarchidae). There are thirty variations of this species of fresh-water fish, but they are typically small fish that are known for their nest building during the spawning season (Herald 1972). The fish from this family could have been caught at any of the local fresh-water streams and lakes that surrounded the city of Williamsburg.

Crustaceans

In the Everard faunal material, several claw fragments indicate that the Chesapeake blue crab (Callinectus sapidus) was a part of the colonial diet. Found in shallow waters, the blue crab presently supports a large seafood industry in the Chesapeake Bay and along the southeastern coasts (Meinkoth 1981). During the colonial period, the blue crab was a popular shellfish along with oysters and clams (Noel Hume 1978).

Amphibians

Preferring large bodies of water, members of the bullfrog family (Rana catesbeiana) are a common sight along the waters of Virginia. Although bullfrogs are considered edible, the presence of a single bone in the Curles Neck assemblage does not suggest that this was a prime food source. Similarly, three bones belonging to the true frog family (Family Ranidae) were found on the Everard site. The frog bones found on both sites probably are the remains of natural deaths as opposed to the remains of a former meal.

Reptiles

Several varieties of turtle were found on both sites with the majority of them being found at Curles Neck plantation. Included in the Curles Neck bones were a single bone from a box turtle (Terrapene carolina) and several bones from a snapping turtle (Chelydra serpentina) and the red-bellied turtle (Chrysemys rubriventris). Bones from a slider or cooter turtle (Pseudemys spp.) are the sole turtle representatives from the Everard property. In all cases, the turtles represent a fresh-water habitat and were commonly served as a dish in the eighteenth-century.

CURLES NECK
SUMMARY CHART

Taxon	No.	Pct.	MNI	Pct.	Meat Wt.	Pct.	Bio-mass	Pct.
FISH								
Class Osteichthyes	3	0.1	0/0	0.0	0.0	0.0	0.09	0.0
Acipenser spp.	35	1.6	1/0	1.8	100.0	1.9	0.94	0.4
Lepisosteus spp.	19	0.8	1/0	1.8	5.0	0.1	0.84	0.3
Family Icatluridae	4	0.2	1/0	1.8	2.0	0.0	0.04	0.0
Rana cates-eiana	1	0.0	1/0	1.8	0.1	0.0	0.00	0.0
REPTILES AND AMPHIBIANS								
Order Test-udines	1	0.0	0/0	0.0	0.0	0.0	0.06	0.0
Chelydry serpentina	4	0.2	1/0	1.8	10.0	0.0	0.27	0.1
Family Emy-didae	1	0.0	1/0	1.8	0.0	0.0	0.03	0.0
Terrapene carolina	1	0.0	1/0	1.8	0.3	0.0	0.29	0.1
BIRDS								
Class Aves	9	0.4	0/0	0.0	0.0	0.0	0.12	0.0
Anser spp.	2	0.1	1/0	1.8	7.0	0.1	0.09	0.0
Anas spp.	2	0.1	2/0	3.6	3.0	0.1	0.03	0.0
Bucephala clangula	1	0.0	1/0	1.8	1.6	0.0	0.01	0.0
Duck spp.	2	0.1	2/0	3.6	0.0	0.0	0.03	0.0
Family Phasianidae	1	0.0	1/0	1.8	0.0	0.0	0.01	0.0
Meleagris	11	0.5	4/0	7.1	30.3	0.6	0.42	0.2
Gallus gallus	7	0.3	2/0	3.6	5.0	0.1	0.10	0.0
Turdus migratorius	1	0.0	1/0	1.8	0.0	0.0	0.00	0.0
MAMMALS								
Class Mammalia	377	16.9	0/0	0.0	0.0	0.0	10.35	4.2
Class Mammalia I	271	12.1	0/0	0.0	0.0	0.0	27.67	11.1
Class Mammalia II	650	29.1	0/0	0.0	0.0	0.0	17.83	7.2

TABLE 3

CURLES NECK
SUMMARY CHART

Taxon	No.	Pct.	MNI	Pct.	Meat Wt.	Pct.	Bio-Mass	Pct.
MAMMALS (CONT.)								
Class Mammalia III	6	0.3	0/0	0.0	0.0	0.0	0.09	0.0
Sylvilagus foridanus	7	0.3	1/0	1.8	2.0	0.0	0.16	0.1
Order Carnivora	1	0.0	1/0	1.8	0.0	0.0	0.02	0.0
Family Ursidae	1	0.0	1/0	1.8	0.0	0.0	1.36	0.5
Procyon lotor	4	0.2	1/0	1.8	15.0	0.3	0.19	0.1
Family Felidae	1	0.0	1/0	1.8	0.0	0.0	0.04	0.0
Equus spp.	1	0.0	1/0	1.8	0.0	0.0	0.22	0.1
Order Artiodactyla	7	0.3	0/0	0.0	0.0	0.0	0.75	0.3
Order Artiodactyla I	3	0.1	0/0	0.0	0.0	0.0	0.28	0.1
Order Artiodactyla II	14	0.6	0/0	0.0	0.0	0.0	1.27	0.5
Sus scrofa	395	17.7	9/3	21.4	1050.0	20.3	35.94	14.5
cf. Sus scrofa	1	0.0	0/0	0.0	0.0	0.0	0.18	0.1
Odocoileus virginianus	10	0.4	1/0	1.8	100.0	1.9	4.08	1.6
Bos taurus	32	14.6	9/1	17.9	3650.0	70.6	132.91	53.6
Ovis aries Capra hircus	43	1.9	5/1	10.7	190.0	3.7	7.09	2.9
cf. Ovis aries/Capra hircus	3	0.1	0/0	0.0	0.0	0.0	0.45	0.2

TABLE 3

EVERARD
SUMMARY CHART

Taxon	No.	Pct.	MNI	Pct.	Meat Wt.	Pct.	Bio-Mass	Pct.
FISH								
Callinectus sapidus	8	0.1	0/0	0.0	6.8	0.0	0.00	0.0
Class Osteichthyes	45	0.7	0/0	0.0	18.7	0.1	0.32	0.1
Family Acipenseridae	2	0.0	0/0	0.0	0.8	0.0	0.03	0.0
Acipenser spp.	28	0.4	1/0	0.9	53.2	0.2	0.74	0.2
Gadus morhua	1	0.0	1/0	0.9	0.7	0.0	0.03	0.0
Family Percidae	4	0.1	0/0	0.0	0.8	0.0	0.01	0.0
Morone americana	17	0.3	4/0	3.7	2.6	0.0	0.04	0.0
Morone saxatilis	1	0.0	1/0	0.9	0.3	0.0	0.01	0.0
Morone spp.	2	0.0	0/0	0.0	0.5	0.0	0.01	0.0
Family Sparidae	1	0.0	0/0	0.0	0.3	0.0	0.01	0.0
Archosargus spp.	2	0.0	2/0	1.9	1.4	0.0	0.04	0.0
Stenotomus chrysops	1	0.0	1/0	0.9	0.2	0.0	0.01	0.0
cf.Stenotomus chrysops	1	0.0	0/0	0.0	0.3	0.0	0.01	0.0
Family Sciaenidae	7	0.1	0/0	0.0	9.5	0.0	0.18	0.1
cf. Family Sciaenidae	1	0.0	0/0	0.0	0.7	0.0	0.02	0.0
Pogonias cromis	11	0.2	1/0	0.9	29.5	0.1	0.46	0.1
Sciaenops ocellatus	12	0.2	2/0	1.9	10.8	0.0	0.20	0.1
cf.Scoaenops ocellatus	1	0.0	0/0	0.0	0.3	0.0	0.01	0.0
REPTILES/AMPHIBIANS								
Pseudemys spp.	2	0.0	1/0	0.9	8.6	0.0	0.13	0.0
BIRDS								
Class Aves	301	4.7	0/0	0.0	140.8	0.4	1.84	0.5
Anser spp.	7	0.1	2/0	1.9	10.8	0.0	0.18	0.1
cf.Anser spp.	6	0.1	0/0	0.0	4.1	0.0	0.07	0.0

TABLE 4

EVERARD
SUMMARY CHART

Taxon	No.	Pct.	MNI	Pct.	Meat Wt.	Pct.	Bio-Mass	Pct.
BIRDS (CONT.)								
Anser anser	5	0.1	1/0	0.9	17.4	0.1	0.28	0.1
cf.Anser anser	2	0.0	0/0	0.0	2.6	0.0	0.05	0.0
cf.Branta canadensis	1	0.0	1/0	0.9	5.0	0.0	0.09	0.0
Anas spp.	10	0.2	0/0	0.0	5.1	0.0	0.09	0.0
Anas platyrhynchos	39	0.6	5/0	4.6	37.7	0.1	0.56	0.2
Aythya spp.	2	0.0	1/0	0.9	0.6	0.0	0.01	0.0
Duck spp.	1	0.0	0/0	0.0	0.4	0.0	0.01	0.0
cf. Arenaria interpres	1	0.0	1/0	0.9	0.0	0.0	0.0	0.0
Family Phasianidae	90	1.4	0/0	0.0	47.6	0.2	0.69	0.2
cf.Family Phasianidae	3	0.0	0/0	0.0	1.3	0.0	0.03	0.0
Meleagris gallopavo	52	0.8	3/0	2.8	77.5	0.2	1.07	0.3
cf.Meleagris gallopavo	8	0.1	0/0	0.0	12.2	0.0	0.20	0.1
Gallus gallus	144	2.3	12/13	23.1	113.2	0.4	1.51	0.4
cf.Gallus gallus	20	0.3	0/0	0.0	15.2	0.0	0.25	0.1
Colinus virginianus	3	0.0	2/0	1.9	0.7	0.0	0.02	0.0
cf.Colinus virginianus	1	0.0	0/0	0.0	0.2	0.0	0.01	0.0
MAMMALS								
Class Mammalia	753	11.8	0/0	0.0	668.8	2.1	9.18	2.7
Class Mammalia I	991	15.5	0/0	0.0	3388.9	10.8	39.54	11.5
Class Mammalia II	1383	21.7	0/0	0.0	1999.9	6.4	24.60	7.2
Class Mammalia III	55	0.9	0/0	0.0	25.0	0.1	0.48	0.1
Didelphis virginiana	3	0.0	1/0	0.9	1.5	0.0	0.04	0.0
Sciurus carolinensis	2	0.0	1/0	0.9	1.5	0.0	0.04	0.0
Felis domesticus	20	0.3	2/0	1.9	46.6	0.1	0.84	0.2

TABLE 4

EVERARD
SUMMARY CHART

Taxon	No.	Pct.	MNI	Pct.	Meat Wt.	Pct.	Bio-Mass	Pct.
MAMMALS (CONT.)								
cf.Felis domesticus	1	0.0	0/0	0.0	0.3	0.0	0.01	0.0
Order Artiodactyla I	7	0.1	0/0	0.0	25.3	0.1	0.48	0.1
cf.Order Artiodactyla I	3	0.0	0/0	0.0	6.3	0.0	0.14	0.0
Order Artiodactyla II	44	0.7	0/0	0.0	223.6	0.7	3.42	1.0
cf.Order Artiodactyla II	6	0.1	0/0	0.0	18.2	0.1	0.36	0.1
Sus scrofa	608	9.5	20/3	21.3	5462.8	17.4	60.77	17.7
cf. Sus scrofa	22	0.3	0/0	0.0	86.2	0.3	1.45	0.4
Odocoileus virginianus	3	0.0	1/0	0.9	53.6	0.2	0.95	0.3
cf.Odocoileus virginianus	1	0.0	0/0	0.0	0.7	0.0	0.02	0.0
Bos taurus	486	7.6	9/5	13.0	16187.3	51.5	161.53	47.1
cf. Bos taurus	34	0.5	0/0	0.0	552.9	1.8	7.73	2.3
Ovis aries	185	2.9	10/1	10.2	1463.7	4.7	18.57	5.4
Capra hircus								
cf.Ovis aries/Capra hircus	19	0.3	0/0	0.0	76.8	0.2	0.31	0.4
Bos taurus/ Equus sp.	6	0.1	0/0	0.0	113.2	0.4	1.86	0.5

TABLE 4

MNI COUNT AND DIETARY IMPORTANCE

An individual mammal skeleton can have over 200 bones, which can easily become fragmented during the processes of deposition. In order to estimate taxon abundance, all the identifiable bones were laid on tables so that an MNI (Minimum Number of Individuals) count could be taken. Basically, this involves deciding which bones could be from the same animal based on the similarities and differences in the sex, size, bone fusion, and the degree of tooth eruption and wear. Bone elements were separated into rights and lefts and then paired together based on the basic guidelines given in Chaplin (1971). For example, all the right adult cow femurs were matched up with any left adult femurs that had similar characteristics. When recording how many individuals were represented and the differences between them, general size categories were also calculated: immature, small adult, medium adult, and large adult. To reach the final MNI count for each species, the most numerous element or paired element is counted for each taxon and then given as the number of adults plus the number of immatures.

An examination of the faunal material from Curles Neck revealed that twenty-four adult and five immature domestic mammals represented the largest category of the MNI count. The bird and fish MNI count included six domestic bird species, three wild bird species, and three species of fish. Finally, four wild mammals and four reptiles/amphibians were

also found at Curles Neck (Figure 3).

In total, thirty-nine adults and nine immatures made up the MNI count for the domestic mammals included in the Everard assemblage. The domestic bird count, which more than doubled those found at Curles Neck, consisted of sixteen adults and thirteen immature birds. The wild taxons included three adult mammals, ten adult birds, thirteen fish, and one turtle (Figure 3).

Although the MNI count can provide an estimate on the number of animals represented in the assemblage, it cannot present an accurate model on the dietary importance for each animal. To reach the dietary contribution figures, the MNI numbers were multiplied by a constant meat weight for each specific taxon. Using the pounds of usable meat method (White 1953), the relative value of the taxons was established for each site.

On both sites, the major food contributors as seen through the meat weight calculations, were the domestic mammals. The cattle were the most dominant making up 70.6% of the total meat weight at Curles Neck and 57.0% of the total Everard meat weight. The pigs were the next highest contributors with the percentage of Everard pig meat weight being slightly higher at 31.8% than the 20.3% of Curles Neck. Finally, the sheep/goat category revealed their importance as being 3.7% of Curles Neck's total meat weight and 5.4% of the Everard property. These percentages demonstrate that although

there were more pig skeletal elements on both sites, cattle were a more important food source due to their greater weight. Similarly, the high MNI numbers for the sheep/goat category, do not reflect a high dietary importance for mutton (Figure 4).

The dietary contributions of beef over pork at Curles Neck and the Thomas Everard property reflect the findings of scholars (Miller 1984; Bowen 1989) who have studied the development of cattle husbandry during the colonial period. The studies of other faunal assemblages across the Chesapeake have revealed that by the late seventeenth- and early eighteenth-century a pattern of cattle husbandry had emerged that allowed beef to surpass pork for dietary importance (Huelsbeck 1991).

Comparatively, the high MNI numbers of chicken in the Everard assemblage do not produce a high meat weight calculation. Even when all the domestic birds are added together, they only make up 1.1% of the total Everard meat weight. The domestic birds at Curles Neck also make up an insignificant portion of the diet with less than 1% of the total meat weight. Not surprisingly, the percentage of wild birds in the diet was also less than 1% for both sites (Figure 4).

The only wild animals to make any significant contribution to the diet on both sites were the white-tailed deer and fish. At Curles Neck 1.2% of the pounds of usable

meat was attributed to deer, while the Everard property was slightly higher with 1.5%. Due to their proximity to fresh and salt water sources, it is surprising that the combined fish species contributed to a low 2.1% of usable meat at Curles Neck and 2.6% of the Everard faunal sample. The low numbers may reflect the small size and fragility of fish bones, taphonomic factors, or the faunal sampling methods used in the field. Finally, the black bear found at Curles Neck presents unique questions concerning its dietary contributions to the provisioning systems of the Randolph family (Figure 4).

MNI CALCULATIONS
EVERARD AND CURLES NECK

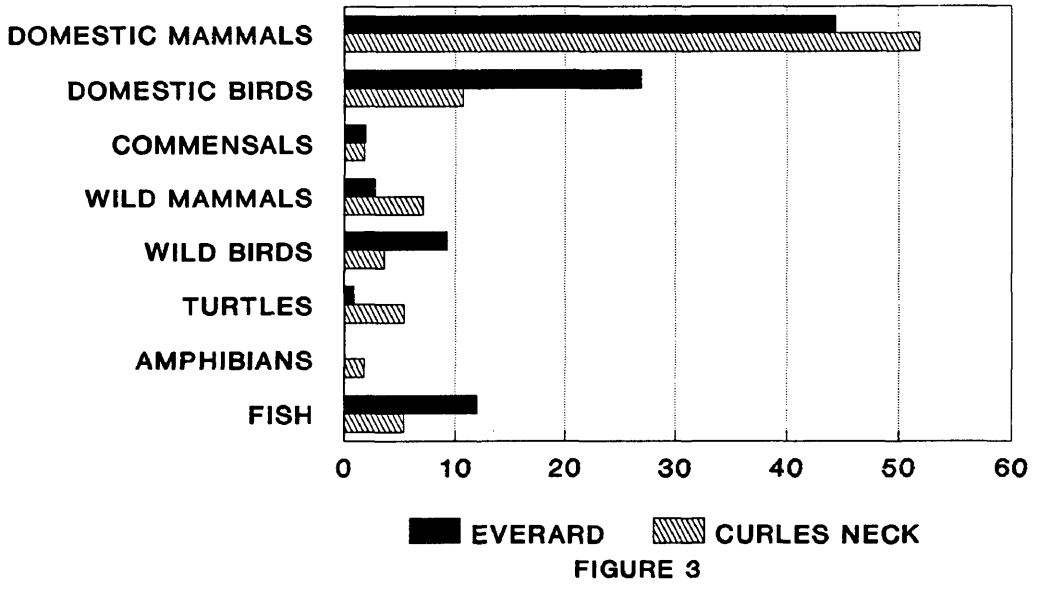


FIGURE 3

POUNDS OF USABLE MEAT
EVERARD AND CURLES NECK

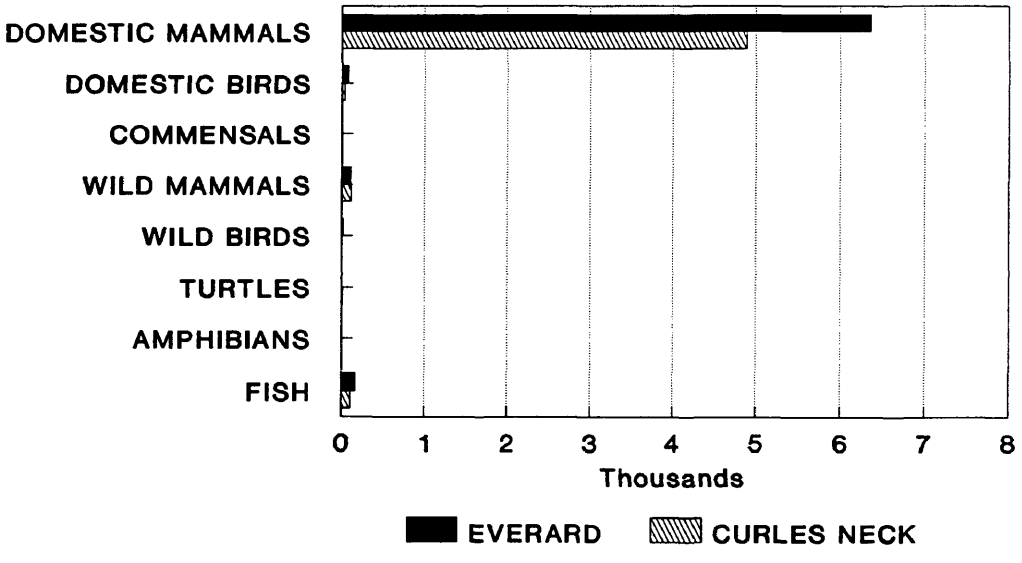


FIGURE 4

KILL-OFF PATTERNS

The age at which an animal dies is useful when trying to establish husbandry patterns and the relationship between the producer and the consumer of domestic mammals. Animals that are raised for a single commercial purpose tend to be killed at an age that corresponds to when the most profit can be made. Animals that are raised in a subsistence-based economy are killed after they have outlived their usefulness or have reached the optimum age for the purpose they served (Bowen 1975). Mortality distributions or kill-off patterns are based on the state of epiphysial fusion of long bones and the state of tooth eruption and wear. For this thesis, only the state of epiphysial fusion was evaluated to provide age profiles for the cows, pigs, and sheep/goats that were identified on both sites. The fusion ages for the bones were determined from the sources of Silver (1969) and Chaplin (1970).

Cattle

The kill-off patterns for cattle provide an interesting difference in the distribution of age groups on both sites. Based on the epiphysial fusion of cow bones at Curles Neck, the majority of cattle (68.2%) fell into the three to four years of age group. The other age categories broke down into 5.3% for the seven to eighteen month age group, 5.1% for the two to three year age group, and 21.4% for the over four years of age group (Figure 5).

The cattle for the Everard property show a notable difference from the mortality distributions calculated for Curles Neck plantation. The age profiles for cattle appear to be more uniform with 22.7% belonging to the seven to eighteen month group, 32.5% attributed to the two to three year olds, 17.2% for the three to four year age group, and 27.6% for cattle over four years of age (Figure 6). Overall, more young individuals were found in the Everard assemblage than in the Curles Neck assemblage.

Kill-off patterns have been useful in past studies of rural sites where the animals were actually being raised and consumed on the same site. Urban sites are more complex due to the variability and availability of products that were accessible to the urban consumer in the eighteenth-century. Many individuals who lived in the urban environment, including the Everard family, also owned plantations or had friends and relatives who had direct access to livestock from the rural areas. This situation combined with the selective processes that can determine what is available in the market place, may be the prime influences for the different kill-off patterns found in urban assemblages (Bowen 1991). Conversely, the lack of young cattle in the Curles Neck assemblage may suggest that Randolph was practicing a more specialized form of animal husbandry and was sending the younger animals to the butcher or to the market to be sold.

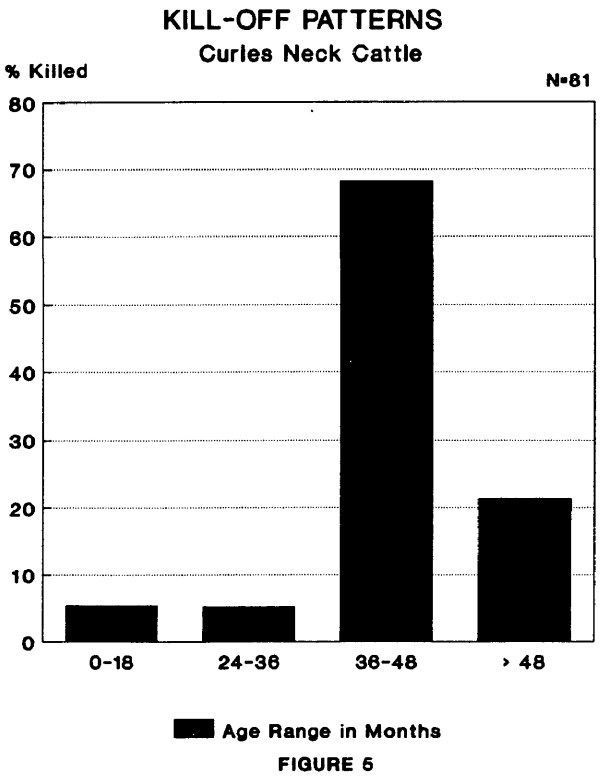


FIGURE 5

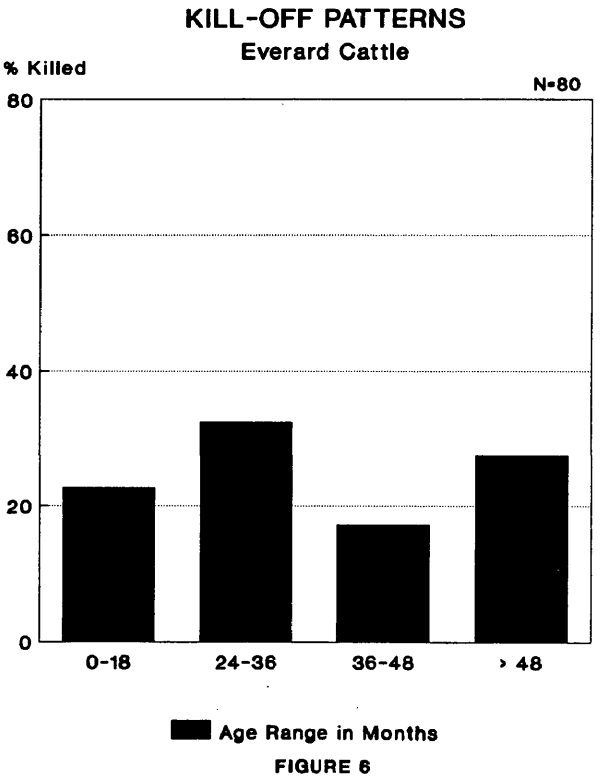


FIGURE 6

Pigs

The distribution of pigs showed that 60.8% at Curles Neck and 60.5% at the Everard site were killed between one and two-and-a-half years of age. This kill-off pattern is typical to other sites including early New England farming economies. Pigs are typically born in the spring and reach their optimum weight of 220-230 pounds before they are even six months old. For this reason they were commonly slaughtered during the fall or wintered over and butchered the following fall, which would have made them one-and-a-half years of age (Bowen 1986). The remaining pig distribution at Curles Neck revealed that the second highest category was pigs over three-and-a-half years of age at 28.6%, and third, 13.3% were less than one year old (Figure 7). There were no pigs represented in the two-and-a-half to three-and-a-half years of age group for the Curles Neck bones, while the Everard assemblage did represent a low 2.9% in this same category. The rest of the Everard pig material distributed 31.0% in the less than one year of age group and 5.6% in the over three-and-a-half years of age (Figure 8).

Sheep/Goat

For the sheep/goat kill-off profiles, the bones that could only be identified as Artiodactyla II (sheep, goat, or deer) were also included. The majority of sheep/goat faunal material on both sites was identified as being over three-and-

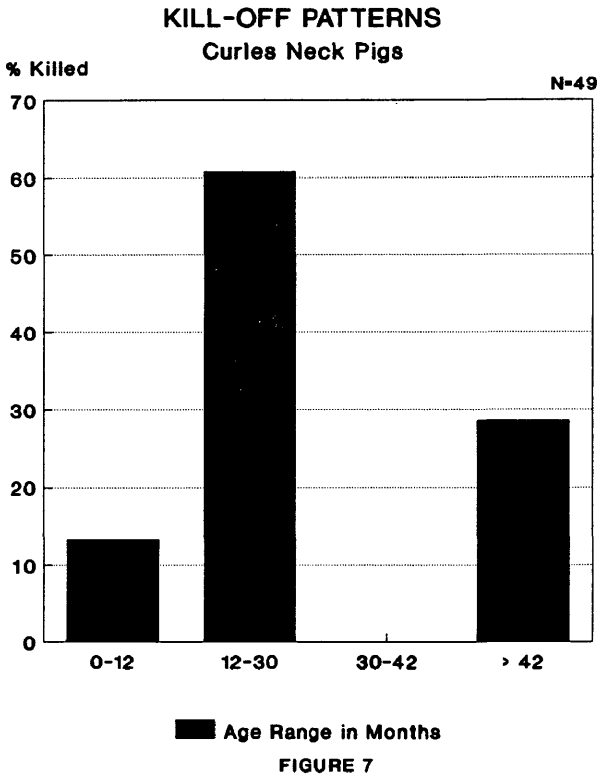


FIGURE 7

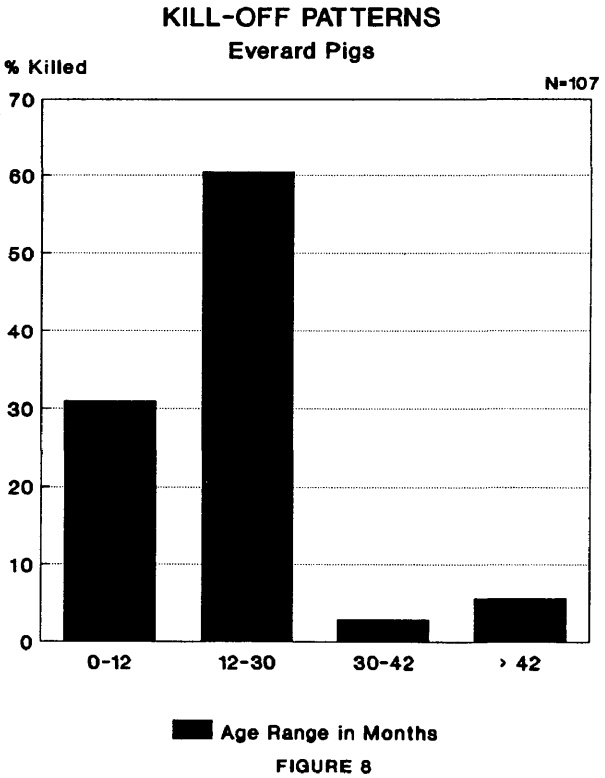


FIGURE 8

a-half years of age (Figures 9 and 10). This indicates that the sheep were probably being raised for their wool and then slaughtered when the wool quality decreased around six to seven years of age (Bowen 1986). Surprisingly, at Curles Neck there were no sheep/goat elements represented in the eighteen to thirty month group, which would have been the best time to slaughter them for their meat. Instead, the remaining Curles Neck sheep/goat kill-off profile includes 25% in the less than one year of age and 12.5% in the two-and-a-half to three-and-a-half years group. The under-one-year age group may indicate the specialized production of lamb. The Thomas Everard assemblage does include a 33.0% representative in the eighteen to thirty month sheep/goats. Finally, the remaining Everard sheep/goats make up 27% in the less-than-one year category and none in the two-and-a-half to three-and-a-half age group.

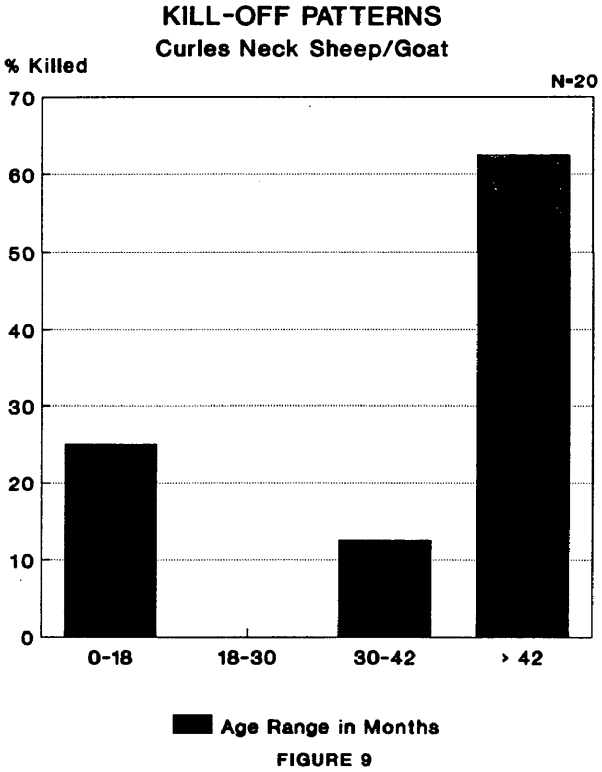


FIGURE 9

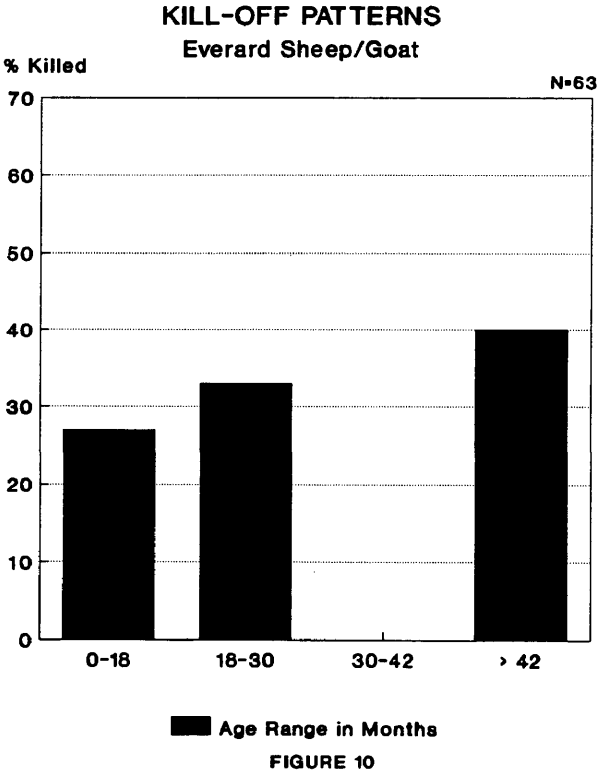


FIGURE 10

ELEMENT DISTRIBUTIONS

Another variable that can be used to evaluate the relationship between the producer and the consumer of domestic mammals is the distribution of body parts on a site. The presence or the absence of certain bones on archaeological assemblages has led to varying ideas on the availability of meat cuts on a site. For instance, it has been suggested that if all elements are represented in the assemblage, this may indicate that the animals were being raised and slaughtered at the same site. A high proportion of meat-bearing bones may indicate that the consumers were being supplied with selected elements, whereas a high concentration of butchering waste would indicate an area where specialized butchering may have taken place (Crabtree 1990). It must be kept in mind that those bone elements that we consider waste material, such as skull fragments and foot bones, may also represent delicacies such as calf's head, calf's foot jelly, or even boiled tongue of beef (Noel Hume 1978; Bowen 1991). Primarily, the element apportionments can represent which meat selections were being made to the consumers on that site through their own production or through the availability of a market system.

Figures 11 and 12 display the anatomical parts of cattle that were found on both sites. The Everard cattle bones are predominantly represented by the vertebrae with 24.5% of the total identified fragments. Parts from the skull, long bones, innominate, and shoulder provide the next most frequent cate-

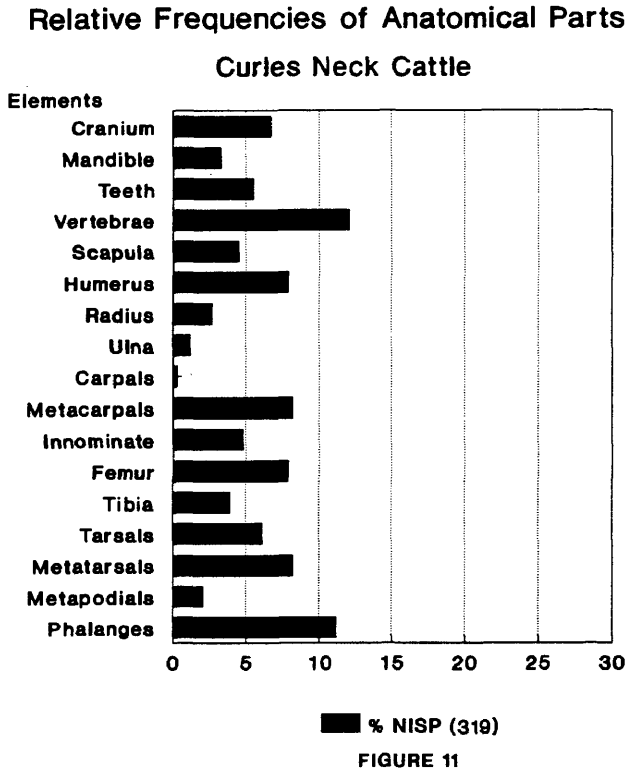


FIGURE 11

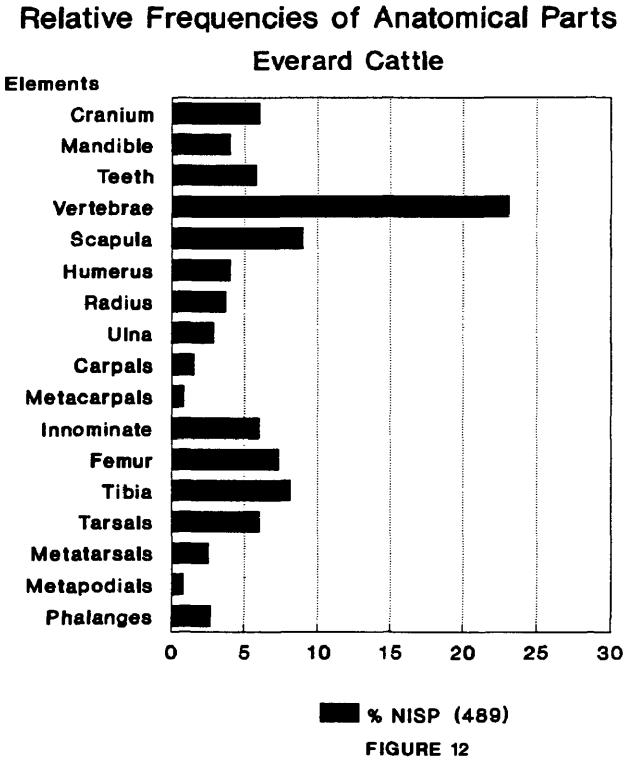


FIGURE 12

gories, which range between 5% to 10% of the total cattle elements. The smallest percentage of bone elements came from the foot bones, which are less than 5%.

The excavated cattle bones are predominantly meat-bearing elements with very little waste parts such as head and feet bones. This skewed distribution of elements may suggest that the Everards were being supplied with selected body parts from their own plantations, and that they purchased meat cuts from butchers or the market place.

The cattle bones from the Curles Neck plantation are represented in a more even distribution of element parts. Vertebrae and foot bones make up the largest percentages with 12.5% and 11.6% of the identified fragments. The majority of the categories fall in a general range between 4% and 9% and the smallest percentage, 1.2%, make up the ulna fragments. The even distribution of all anatomical parts at Curles Neck seem to suggest that cattle were being slaughtered at the site.

Teeth made up the largest identifiable element of pigs on both sites due to the distinctive characteristics that make them easy to identify (Figures 13 and 14). The remaining pig elements were all represented in each assemblage, with the majority of them being under 5%. There was also a fairly even distribution of elements belonging to the sheep/goat categories for the Everard site (Figure 16). Surprisingly, not all sheep/goat elements were represented in the Curles

Neck assemblage (Figure 15). There were no foot bones identified for the sheep/goat category, which may suggest that these animals were not being raised and butchered at this site, but obtained elsewhere.

As with the MNI counts and the kill-off patterns, body part distributions can be affected by many influencing variables. Besides the natural influences, there are also human associated conditions related to animal husbandry patterns and the market system that must be kept in mind during interpretation of the faunal material (Crabtree 1990). The next two chapters will examine these human influences and how they may have influenced the Everard and Randolph assemblages. Specifically, diary accounts, eighteenth-century Virginia laws, and an early nineteenth-century farm journal will be examined for information they can provide on animal husbandry practices of the late eighteenth-century rural Chesapeake provisioning systems. The urban influences will be discussed in Chapter VI by examining the history and the impact that the Williamsburg market had on its urban consumers.

Relative Frequencies of Anatomical Parts

Curles Neck Pigs

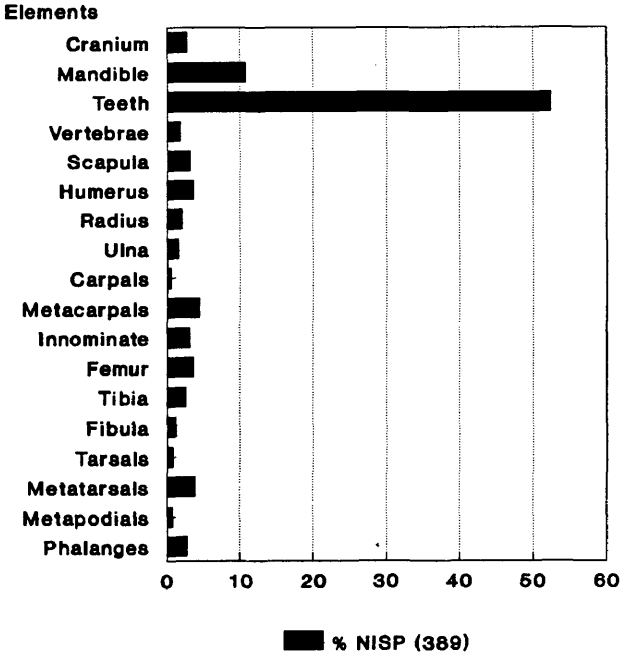


FIGURE 13

Relative Frequencies of Anatomical Parts

Everard Pigs

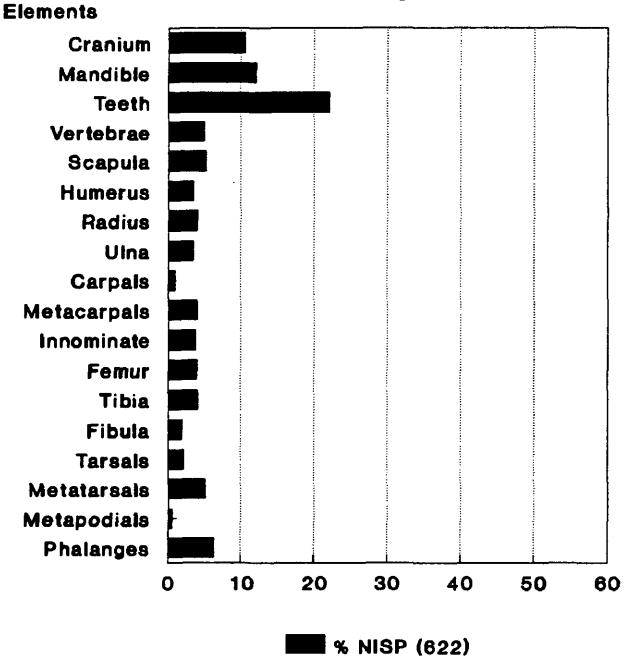


FIGURE 14

Relative Frequencies of Anatomical Parts

Curles Neck Sheep

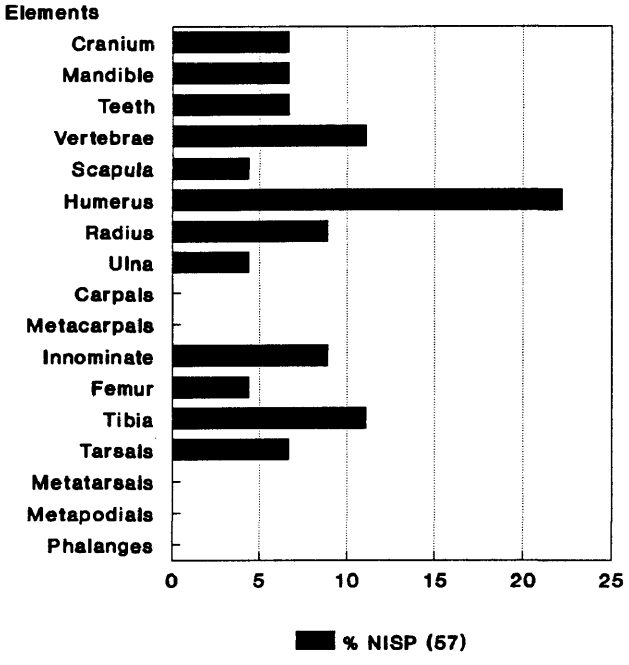


FIGURE 15

Relative Frequencies of Anatomical Parts

Everard Sheep

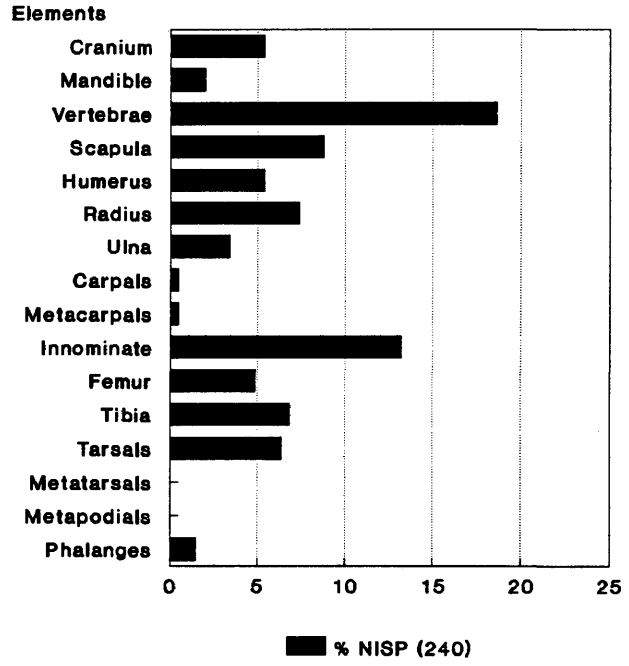


FIGURE 16

CHAPTER V

PATTERNS OF ANIMAL HUSBANDRY

Understanding the animal husbandry practices of late eighteenth-century Chesapeake provisioning systems is crucial in determining how the herd management strategies evolved to accommodate the growth of urban communities. As the procedures of animal rearing changed, the availability of certain foodstuffs and the availability of particular cuts of meat were also affected. Due to the lack of any existing written documents concerning the animal husbandry patterns of the Randolph family, this thesis will examine other historical records to provide some insights into the practices of animal rearing at Curles Neck plantation. Specifically, information from Landon Carter's diary, early Virginia laws, and the farm journal, American Farmer, will combine to present a base line for what animal husbandry techniques were being performed by the elite planters of the late eighteenth-century.

It is known that the eighteenth-century was a time of changing subsistence strategies and a growing market system. Gone were the days of the seventeenth-century when tobacco was the main source of income and animals were raised strictly for personal subsistence use. Farmers of the eighteenth-century

began to see the necessity of raising new cash crops and raising their animals for profit. New techniques of animal rearing began to emerge so farmers could adjust their husbandry techniques from being subsistence-oriented to profit-oriented. This was a gradual transformation, which was not firmly established until the early nineteenth-century.

THE AMERICAN FARMER

To discover how the early practices of farming, stock raising, and horticulture evolved, agricultural historians have long relied upon nineteenth-century farm journals for information. Farm journals have also proven to be informative to the zooarchaeologist by revealing some of the techniques that were being practiced, or at least considered, for both subsistence and commercially oriented animal husbandry. Specifically, articles in the farm journals discussed the care, feeding, and selective breeding practices for domestic animals. Old and new advice was given on the subject of animal diseases, the specific measurements for a proper livestock shelter, and the rotation of animals in the fields (Farrell 1977).

Farm journals have often been regarded as a controversial source for giving the "true" picture of agricultural life. It has been believed that farm journals were mainly concerned with experimental agriculture and scientific advice, which farmers were hesitant to apply to their traditional methods of

farming (Abbott 1968). Although some journals may have been more popular than others, the information they can provide should not be discarded. Farm journals are a relatively untapped source of material for the student investigating any phase of American life before the Civil War. The development of the annual agricultural fair, the evolution of architecture for the period, the expansion of school programs, the condition of the household economy, the rearing of children, the woman's rights crusade, the current political affairs, and the progress of internal improvements are just some of the many topics covered in the articles, advertisements, and letters of the farm journals. The editors of the journals wrote their publications in an attempt to educate farmers on husbandry techniques that reflected commercial goals, rather than the subsistence-oriented husbandry strategies they had practiced for generations. Although some journals provided more scientific approaches than others, there were journals that also focused on the practical methods of agricultural and how they benefited the farmer. As Edmund Ruffin, the agricultural authority, wrote in 1851:

> The progress of American agriculture is mainly due to the diffusion of agricultural papers. In the actual absence of all other means, these publication, almost alone, have rendered good service in making known discoveries in the science, and spreading knowledge of improvements in the art of agriculture (Demaree 1941b).

Before the start of the Civil War there were over four hundred journals that reflected many of the agricultural practices being observed in varying parts of the country

(Demaree 1941b). For this thesis, the American Farmer was analyzed for the information it might provide on the profit-oriented husbandry practices related to sheep, pigs, and cattle in Virginia and Maryland.

The American Farmer is considered to be the pioneer and model for all other agricultural journals that followed. It was first established in Baltimore by John Stuart Skinner in 1819 and continued to be published and read by farmers for over fifteen years (Drake 1872). Like hundreds of journals that followed it, the American Farmer reflected the personality, interests, and experiences of its editor. John Skinner was born in 1788 in Calvert County, Maryland, where he spent his early years on the family plantation. Following a series of positions in the courts of Annapolis, Skinner was admitted to the bar at the age of twenty-one; but with the outbreak of the War of 1812, he was appointed as the inspector of European mail and as an agent for prisoners of war. These governmental positions, as well as his appointment as a purser in the Navy, enabled Skinner to make many friends in both the British and American governments (Drake 1872). From 1816 to 1837, Skinner was assigned as the postmaster of Baltimore, and it was while he was holding this position that Skinner became inspired both by the works of John Taylor of Caroline and by the poor condition of soil in Maryland (Demaree 1941a). On April 2, 1819, Skinner presented to the public the first edition of the American Farmer, in which he outlined the

purpose of his journal:

> The great aim, and the chief pride, of the American Farmer, will be, to collect information from every source, on every branch of Husbandry, thus enable the reader to study the various systems which experience has proved to be the best, under given circumstances (1819-1830:I:5).

With a devotion to farming, Skinner's American Farmer became a weekly journal of eight pages with an annual subscription rate of four dollars. The journal quickly became the principal source of expression for all those who took an active role in the improvement of agricultural methods. Subscribers to the journal were urged to use the American Farmer as an agricultural resource, not just as a weekly magazine. Back issues were always on sale in the Baltimore office and 90% of its readers agreed to have their issues bound annually (Demaree 1941a). Many well-known agriculturalists, at home and abroad, used the journal to discuss and communicate information on every aspect of farming. Men such as John Taylor, Thomas Jefferson, James Madison, John Calhoun, Henry Clay, Timothy Pickering, Sir John Sinclair, Thomas Coke, and General Lafayette made frequent suggestions to the improvement of agriculture through the pages of the American Farmer. A surprising number of subscribers to the journal came from officers in the United States Navy. Due to friendships and correspondents he made as a purser, naval officers frequently sent Skinner agricultural information, seeds, books, and poultry from all corners of the world. As members of the Navy they might not have been

directly using the agricultural knowledge found in his journals, but the officers did help to filter the American Farmer to other foreign countries (Demaree 1941a).

Although practical contributions from the "dirt farmer" were often difficult to obtain and many subscribers represented the elite of "gentlemen farmers," Skinner did stress that "our first wish is to communicate the experience of the sun-browned practical Farmer" (American Farmer 1819-1830:IV:47). It has been assumed that many late eighteenth- and nineteenth-century farmers resisted the idea of book farming and the use of agricultural journals. Based on the number of readers, letters to the editor, and the wide distribution of the American Farmer, it appears that Skinner's journal was not read solely by the wealthy farmers. Studies on agricultural journals, such as the Cultivator (1839-1865), have tried to present a profile of the type of subscribers to agricultural journals. Based on local histories, census data, directories, and manuscript papers, subscribers to the Cultivator were primarily farmers and secondly, local professionals. They were individuals of comfortable existence but by no means extremely wealthy. They shared the information in the journal with their family and neighbors and tried to reach a medium between technical methods and tradition (McMurry 1989).

The average farmer benefited from Skinner's attempts to keep the reader aware of the latest developments, while also

struggling to break down the popular superstitions and fallacies that often plagued the traditional farmer (Demaree 1941a). He warned his subscribers that the science of agriculture was to be endured and tested throughout the whole year and was not always easily understood. Essays on a single subject "will often be long and tedious," therefore he recommended that farmers have the journal read aloud to them so they may ponder on the content of the articles (American Farmer 1819-1830:I:265). Readers did listen and often applied the information they read to their own agricultural practices. Letters recounting experiences demonstrate the effectiveness the journal had on protecting readers from radical farming techniques that often caused more harm than good (McMurry 1989).

As previously mentioned, the American Farmer and journals that followed, often campaigned against the traditional plantation styles of agriculture that were used in the seventeenth- and eighteenth-centuries. They strived to provide informative data on the useful scientific and technical advances in agriculture that would be useful not only to the practical farmers but also to the "gentlemen farmers" as they attempted to produce crops and animals for sale, rather than for their own consumption (McMurry 1989). To attract the general farmer, a wide range of topics was addressed concerning many aspects of rural life. Seasonally included in the American Farmer were articles on crop

rotation, new fertilizers, hedging, grasses, and plowing. Travel accounts, based on visits to other farms across the country, provided practical examples on the techniques that other farmers were applying.

Skinner reported on his own findings that dealt with the systematic improvement of various breeds of domestic animals. With the cooperation of the Maryland Agricultural Society, he established the "Maryland Tavern," a stock farm, in 1821 (Malone 1935). The American Farmer was the first of many journals that encouraged the improvement of cattle breeds in the United States (Demaree 1941a). With these personal achievements and his extensive and varied agricultural experiments, Skinner helped to prove to his skeptical subscribers that he was proficient in handling not only the pen but also the plow.

As part of his interest in encouraging farmers to accept "improved" husbandry techniques, Skinner emphasized the need for the establishment of agricultural schools and the appointment of agricultural professors to colleges, as Columbia College had done in 1792 (Demaree 1941a). Like many journals that followed, the American Farmer was written in a manner that praised the role of the agricultural profession in society and the virtues of farming. Farmers were encouraged to join agricultural societies and use the journal as a means to publish their papers and meeting notes (Abbott 1968).

Through the years as editor, Skinner appeared to have

established a friendly and intimate relationship with his readers. One of his most effective measures for obtaining a rapport with the farmers was the adoption of a "question and answer" section. Requests and inquiries of all sorts were printed in the journal and then answered by Skinner and other farmers from all over the United States, including Thomas Jefferson and Henry Clay (Demaree 1941a). In the course of his career, Skinner's contributions to the progress of agriculture were recognized by many agricultural organizations at home and abroad. He became an honorary member of many societies related to agriculture and won many medals for his work. Not limited to his work in the American Farmer, Skinner contributed many agricultural articles to leading newspapers such as the Albion and the Philadelphia Courier. He also edited and wrote introductions for more than eight books on various aspects of agriculture (Malone 1935).

It is difficult to estimate the exact influence of his journal, but it is known that after three years of circulation, there were at least 1,500 subscribers who could be found in every state and territory in the Union. When Skinner sold the American Farmer to I. Irvine Hitchcock & Co. in 1830, it was valued at the vast sum of $20,000. The journal survived for another four years, but the loss of its renowned editor and the competition from other agricultural periodicals made it necessary to discontinue its publication (Demaree 1941a).

Agricultural journals and their editors diffused information that was thought to be useful and serious knowledge. As with all magazines and newspapers, it is the discretion of the reader to choose what is worthy and applicable to his or her own life and situation. The large number of subscribers and the popularity of the American Farmer may indicate that farmers were beginning to incorporate new techniques as they shifted their animal husbandry patterns from raising livestock for consumption to raising animals for sale to urban communities.

In historical retrospect, farm journals have been a much neglected source of informative economic and social data. In an attempt to examine one of these sources, the American Farmer was chosen based on Skinner's emphasis on animal husbandry, its wide circulation, its high subscription rate, its ties to the Virginia and Maryland area, and its early nineteenth-century beginnings. The American Farmer was surveyed as a cross-section of the life of the times, as well as a reflection of the times gone by since there were no widely distributed agricultural journals like the American Farmer in the late eighteenth-century.

For the study of animal husbandry patterns in the eighteenth-century, this author read every issue of the weekly American Farmer for the first seven years of its publication. Although there were many references to animal husbandry, only those that directly pertained to the practices of Virginia or

Maryland were noted. Particularly, only recommendations concerning cattle, pigs, and sheep/goats were considered for interpretation. As will be discussed in the second part of this chapter, the data from The American Farmer was combined with documentary data from Landon Carter's diary and Hening's Laws of Virginia, to discern animal husbandry practices in the late eighteenth-century and how they may have influenced the Randolph and Everard households.

ANIMAL HUSBANDRY PATTERNS OF THE EIGHTEENTH-CENTURY

To gain a better understanding of the urban provisioning system of the eighteenth-century, traditional husbandry practices and the laws that pertained to them need to be examined. Also, changes in the agricultural economy and the demands of the urban consumer need to be considered for their roles in the transformation of the seventeenth-century methods of animal rearing into the eighteenth-century practices of animal husbandry.

As discussed in Chapter 1, tobacco was the main cash crop in the early colonial Chesapeake economy. Due to its importance, the whole agricultural system centered around its production and distribution. Cultivating corn became important as the main subsistence crop, but little attention and labor was directed towards the raising of cattle and pigs. Typically throughout the seventeenth-century, planters would have allowed their cattle and pigs to wander freely throughout

their own property and that of their neighbors. Some planters maintained large wooded areas that served as reserve land for when their cultivated fields became depleted of the natural minerals. The woodland reserves were commonly used as grazing areas for the large herds of cattle, which would multiply on their own so the planter could focus his attention on the tobacco economy (Gray 1933; Lang 1954; Bowen 1991).

Although not much care was provided for cattle in the early agricultural systems of seventeenth-century Chesapeake, cattle thrived in the open woodlands and fields. In faunal assemblages from the late seventeenth-century, the kill-off patterns reveal that the majority of cattle were slaughtered at four years of age and older. This trend began to change in the early eighteenth-century when more cattle between the ages of two and four began to be killed for food (Miller 1984).

At this time the role and practices of agriculture were also changing. Tobacco was not the influential product it once was due to the low prices of tobacco in Europe and exhausted soil in the colonies. Agriculture shifted to a more intense method of farming with the production of grain products such as wheat and the raising of large flocks of sheep. As more fields were prepared for the cultivation of wheat, more fields began to be enclosed with fences. Likewise, sheep were not able to defend themselves and survive in the wooded areas like the cattle, hogs, and goats had done in the past. An enclosed pasture system developed that

provided a protected range for the grazing of sheep (Gray 1933; Walsh 1989).

Cattle could have also benefited from the improved protected pasture systems, although Virginia laws from the eighteenth-century reveal that animals wandered freely. A question of ownership seemed to have been a frequent problem when animals wandered on to the property of others. A law that was first written in 1705 and rewritten in 1748, proclaimed that any person who "takes up any stray horse, mare or cattle," is obligated to find the rightful owner of the animal. Only after sufficient advertising at church and through the country court would a person be allowed to declare the animal as their own property (Hening 1819-1823:VI:133). There were also the problems concerning the theft of wandering cattle and the transferring of contagious diseases between herds. In 1748 an act was passed that was directed towards preventing the unlawful taking of cattle:

> Whereas divers vagrant people who travel through this colony, from the northern provinces, to the southern, pedling, and selling horses, and either buy, or steal, great numbers of nett cattle, which in their return back, they drive through the frontier counties, and often take away with them, the cattle of the inhabitants, of the said counties, under pretence that they cannot separate them from their own droves, to the great damage of the said inhabitants (Hening 1819-1823:VI:124).

Drivers of cattle who passed through the colony of Virginia had to present a detailed inventory of the sexes, ages, marks, and colors of all the cattle that were included in their herd. This account would be written by the

magistrate of the last province they visited and immediately given to the justice of the county they were passing through, who in turn would add any descriptions of cattle bought in their own jurisdiction. Failure to follow the policies of the act forfeited the driver's right to ownership of the herd, which automatically became the property of the court (Hening, 1819-1823:VI:125).

Wandering cattle also promoted the passing of contagious diseases that would have quickly destroyed the population of a herd. Landon Carter commented on one of these diseases which infected his own cattle in 1770; "And the plaguy distemper broke out amongst my cattle again. Ball [overseer] perhaps the occasion of this by turning them out to pasture to wean the Calves; for I heard the infection was in the neigbourhood" (Greene 1965:491). An act for the "preservation of the breed of cattle" was passed in November of 1766 to prevent the further loss of stocks of cattle. Any cattle driven through the colony were required to have a bill of health which declared that the animals were free of any contagious diseases such as distemper. Similarly, any infected cattle that lived within the colony limits were not allowed to go at large. The animals were to be kept separated from the herd until they were completely recovered. If they did not recover, the owner was obligated to destroy the animals and burn the carcasses before other cattle could be infected. Failing to properly dispose of the animal or

allowing sick cattle to wander freely brought strict fines to the owner of the beast (Hening 1819-1823:VIII:249).

Finally, the owners of "unruly" animals were warned against the act of trespassing in 1748:

> That if any horses, mares, cattle, hogs, sheep or goats shall break into any grounds being enclosed with a strong and sound fence, five feet high, and so close that the beasts breaking into the same could not creep through...the owner shall, for the first trespass so committed, make reparation to the party injured, for the true value of the damage he shall sustain; and for every trespass afterwards, double damages, to be recovered, with costs (Hening 1819-1823:VI:36).

The trespassing of animals, both his own and his neighbors, was a frequent subject of Landon Carter's daily journal entries. In particular, pigs proved to be the most common trespassing offenders by breaking out of their stalls and rooting in the tobacco and corn fields. In 1774 Landon Carter decided to increase his interests in the raising of hogs for food, while also attempting to change some of his animal husbandry practices. Due to the increase of inhabitants around his plantation, Carter chose to prohibit his hogs from wandering freely in the woodlands as they had previously done. Despite his efforts to try and keep his hogs within the confines of a fence, they would frequently root under the fence and trespass onto his neighbors' land. Having tried every possible method suggested to him, Landon Carter devised his own method of restraining his animals to avoid the costly charges of trespassing. "Plyable cloggs," approximately six inches in length were tied to the hind

quarters of the hogs to prevent them from jumping over ditches and rooting under fences (Greene 1965:898).

The trespassing act of 1748 also warned individuals on the condition of fences that enclosed their fields. To be considered a lawful fence it had to have been a five-foot-high, close rail fence or a two-foot-high hedge fence with a three-foot ditch on one side. In trespassing cases, the condition of the plaintiff's fence for keeping animals out would be inspected by an impartial jury. If a fence was judged to be unlawful, the owner would not receive any compensation for injury done to his field (Hening 1819-1823:VI:36). In 1821 this law still applied in several eastern states, including Virginia, and became the subject of several articles that were published in the American Farmer. As with the eighteenth-century law, landowners were obligated in the early nineteenth-century to keep their fences in prime condition to prevent the trespassing of neighbors' animals and to prevent their own animals from trespassing. Some individuals wrote that the fence requirements for securing agricultural fields were too strict and were unfair to the farmer by costing him time and money, when the law should concentrate on the fences that enclosed animals. Some farmers suggested that if fences were needed to protect crops, hedges should be planted to replace the rail fence since they were considered more durable while also being ornamental (Skinner 1819-1830:III).

Diary accounts by Landon Carter reveal some of the unforeseen situations that occurred between plantation owners and their practices of animal husbandry:

> Wm. Tutt, it seems now Colonel Tayloe's Overseer at the fork, came last night to order George to keep my Cattle out of Colonel Tayloe's old fields. I am always ready to do this...but Tom Reynolds, Colonel Tayloe's previous overseer would always be pulling my fence down to let his or the plantation horses into my pasture and take them out when he pleased so that through those gaps my Cattle got into Colonel Tayloe's grounds. It is the very same thing now...I have ordered George to put the fences up immediately and bid him to tell Tutt I was willing to keep my Cattle out as he knew and he must keep his horses out (Green 1965:360).

As owners developed new husbandry practices designed to restrict the movement of their animals, trespassing still remained a common problem throughout the eighteenth-century. To help enforce charges of trespassing, lawmakers designed new laws even within the boundaries of the urban environment. As early as 1714, pigs were prohibited from roaming at large within the city of Williamsburg. The damage they were doing by rooting in the streets and under the buildings, prompted the act which stated that any pigs over two months of age, which were not ringed to prevent rooting, were to be kept in an area located one mile from the church. Individuals were fined for not following the act's orders but were rewarded for catching any pigs that were not properly ringed (Winfree 1971:134). The presence of wandering animals either on rural or urban sites could have been costly to both the owner and their neighbors.

By examining articles written in the American Farmer and

Landon Carter's diary, a better understanding can be reached on how methods of animal rearing were changing. In 1819, Mr. Madison, president of the Agricultural Society of Albemarle, Virginia, addressed the society on the maintenance of cattle on a farm. He commented that one of the greatest errors commonly committed by farmers was in trying to raise more cattle than the resources allowed. He believed this fallacy was the "effect of inattention to the change of circumstances through which our country has passed." Initially, the open woodlands served as the habitat for the cattle, which naturally provided food and protected them through the summers and winters without much expense to the farmer. As more fields began to be enclosed, raising cattle and providing food for them began to present problems to the farmers. Mr. Madison believed that the declining quality of Virginia cattle was due to farmers who were still trying to raise the same number of cattle as when the forests housed the animals. Stressing the importance of profitable cattle husbandry, he recommended that if the food sources could not be increased, then the number of cattle raised should be reduced for better results (Skinner 1819-1830:I:178).

Even in the late eighteenth-century, the problem of having too many cattle was recognized by farmers, such as Landon Carter. In 1772, Carter was faced with a late, wet, cold spring that was endangering the survival of his herd. The food sources for the cattle were all depleted and the

cattle were not producing enough dung to properly fertilize his newly turned fields for the summer crops. He commented, "I know some argue much for fewer cattle - In the winter time they may be right, as we are situated, but our best manure is made in the Summer, when every creature goes about to bring its load of grass to the Cowpen in large droppings of dung" (Greene 1965:670).

Skinner produced a series of articles on the husbandry practices of Virginia that were based on personal interviews he conducted on "both sides of the Blue ridge" in 1821. Depending on the size of the farm and the time of the season, he recorded that the number of cattle on a farm ranged from 100 to 1,000 head. They were typically bought during the months of September or October and fattened during the winter months on rough foods such as straw and corn fodder and through the following summer on grasses. The large amounts of dung they produced were spread over the fields and ploughed in as fertilizer. In late fall they were ready for slaughtering on the farm, or more generally for sale at a cost almost double the amount at which they were bought (Skinner 1819-1830:III).

To help protect the cattle and efficiently raise them for market, the American Farmer reported that some individuals in the early nineteenth century believed that shelters were a necessity in cattle husbandry (Skinner 1819-1830:III). Landon Carter built cowstalls on his plantation in 1757 with the

purpose of protecting his cattle from the rain, snow, and wind. In his diary he goes into great detail describing the construction of the stalls:

> These stalls shall be raised with earth a foot above the level of the yard and a causeway much like the hacks of a brick yard shall be carryed all round. These stalls shall be Constantly littered and cleaned out every monday and the litter thrown into the spaces between the stalls of the Raised hacks which shall be also strewed with straw after every rain and every morning after the Cattle are turned out of their stalls. They shall be drove Gently about in these spaces and then turn out to browse about for the Conveniency of making these to all my yards as some of them will be moveable (Greene 1965:150).

Carter also found the stalls to be of service for the housing of calves, who were separated from the cows at an early age. The calves were allowed to suckle only three times a day, since it was believed that a constant draw on the cow's teat would not allow the bag to stretch to its fullest capacity. Besides preventing excessive exercise or exposure to the wet grounds, Carter also believed that the separation allowed the cow to freely hunt for food while knowing that the calf was safe (Greene 1965:195).

These new methods in cattle husbandry, which were expressed in the American Farmer and practiced by Landon Carter, demonstrate the new direction that farmers were taking towards animal rearing. By protecting the animals, monitoring their feeding habits, and supervising the raising of the young, farmers were able to produce marketable cattle more efficiently and at a younger age than the traditional methods

had been able to do.

Besides cattle, hogs were another animal raised on plantations for the large profits they could produce. Methods of pig husbandry in Virginia and Maryland that were outlined in 1821 in the American Farmer probably reflected the late eighteenth-century practices. Unlike the earlier practice of letting hogs run free, hogs were kept in confinement, so that they could kept clean, well-nourished, and warm during the cold months. Optimum food included several ears of corn interspersed with boiled rutabagas and other vegetables. During the fattening season, turnips and pumpkins were suggested as a supplement to the occasional grazing of grasses in the fields. As with the cattle careful supervision of the feeding and penning of hogs, helped to improve a farmers' efficiency in producing more marketable animals.

Hogs are, by their nature, difficult to pen. To keep them contained, Landon Carter did not ring the snouts of his hogs but had young slave girls, referred to as "hog wenches," supervise their movements. He tried to keep his hogs within the confines of selected fields and pens, but even with supervision the hogs were still able to root in his fields and destroy some of his crops. There are numerous references in his diary to the "sleepiness" of the slave girl, who was ordered a whipping each time the hogs were found in the corn fields (Greene 1965:521).

Evidence that planters raised hogs for sale can be found

in Landon Carter's diary. He raised hogs, which he fattened on trash corn, to feed not only his plantation, but also to sell to his neighbors. Besides maintaining around thirty of his own hogs, he raised some of his friends' and neighbors' hogs. One English boar in particular, who belonged to a Mr. Parker, was constantly escaping and roaming the corn fields. Carter found the boar to be too mischievous to keep and told Mr. Parker during court days that he would be returning the hog to him. Unfortunately, the boar died during the return trip and Mr. Parker wrote a joking letter to Landon Carter that he found the animal to be the gentlest creature in the world and was not obliged to have him penned (Green 1965:486).

Sheep, too, were raised for profit. Landon Carter, for example, raised approximately 100 sheep for meat and wool. During the warm months, Carter seemed to have kept his sheep in the open fields so that they could graze on wheat, rye, and clover. In the winter and wet months, however, they were often brought into a covered building where they were fed corn and protected from the elements. Despite Carter's attempts, lambs and ewes were frequently dying from the cold, drought, disease, and lack of food. He also wrote that dog attacks caused the death of 34 of his sheep in 1763 (Greene 1965:258).

The rearing of sheep was described in the American Farmer as "an object well worthy of the attention" for the quality of wool and meat that could be produced. In one article it described the practices of sheep rearing in Maryland and

Virginia in the eighteenth-century:

> Sheep have been considered as a stock able to shift for itself, to do without care, and without food, except what it picks from the fields, as well in winter as in summer; hence, every year poverty, and diseases arising from poverty, occasion a loss of lambs and furnish a miserable pittance of dry wool, half fallen off (Skinner 1819-1830:I:332).

To help preserve the flocks of sheep, the article suggested that lambs be nursed carefully during the first several months, that the sheep be supported in all seasons, and that they be killed when they could no longer readily feed in the fields. It also specified feeding instructions and shelter, which resembled Landon Carter's husbandry patterns. Grass, clover, rye, and other grains were to be supplied throughout the year and a form of shelter was recommended to keep them from the rain, cold, and dogs which often attacked them during the night (Skinner 1819-1830:I:332).

Discovering the patterns of animal husbandry in the eighteenth-century can offer insights into the role of the market and how they were being supplied by the rural producers. Since there are no accounts of how the Randolphs and the Everards specifically raised animals on their own farms, Landon Carter's diary and Skinner's American Farmer have provided clues to the restrictions and the conditions of animal rearing. Keeping in mind that Landon Carter probably represents one of the more wealthy and progressive plantation owners of the late eighteenth-century and that animal husbandry practices were becoming more specialized on some

farms, it seems apparent that the goals of wealthier farmers, such as Richard Randolph II, were shifting from a subsistence-based approach to a more commercial strategy directed towards supplying the urban market.

CHAPTER VI

THE WILLIAMSBURG MARKET

When the Curles Neck and the Everard assemblages are compared, obvious differences and similarities emerge. In order to address these issues and interpret the availability of foods in the rural and urban environments, all aspects of foodways must be considered. This thesis has already examined the histories of the Everard and the Randolph families, the changes that were occurring in animal husbandry patterns during the eighteenth-century, and the age and element distributions of the species identified on each site. This chapter will elaborate on these findings by discussing the history of the Williamsburg market and the role it played between the rural producer and the urban consumer.

Based on historical records, it is known that there was a market in Williamsburg when Thomas Everard lived there, yet he could have also obtained his foodstuffs from several other sources. From one of his own or one of his neighbors' plantations, Everard could have acquired livestock and grain, while within the city limits he may have raised some of his own livestock and food products (Samford 1990). With all of the sources available to him, it can be difficult to determine how much Thomas Everard depended on the market without also

examining the history and the influence of the marketplace in Williamsburg.

The marketing of goods is one of the basic characteristics of any reasonably sized town with wide-ranging economic diversity and influence. Eighteenth-century England and America were no exceptions to this theory, as markets were held on a weekly basis to serve as centers of exchange. Unfortunately, due to the destruction of many of Williamsburg's court and administrative records, there is a lack of detailed accounts and descriptions of the market building and its inner workings (Lounsbury 1986). To gain a better understanding of the market's position in Williamsburg, it is also necessary to examine what is known about other market systems that existed at the same time in towns such as Fredericksburg and Norfolk.

In most towns, market day was a time when the local farmers, tradesmen, and craftsmen came to peddle their wares. Often included among the sellers were "hucksters," individuals who traveled from town to town buying farmers' produce and then reselling the goods in the market at inflated prices. This was known as "forestalling," and many authorities in towns established laws to try and curb the huckster's business. Despite the ordinances that were designed to keep them from buying goods on the way to market, before the market began, or even after the market was open, the hucksters persisted through the history of the early market systems

(Bridenbaugh 1938).

Initially, impermanent stalls and booths were often raised on the open areas set aside for the market. As towns grew, so did their markets, which eventually developed into permanent buildings and shops that were often divided into separate sections to handle the increased trading. Among the goods that were displayed were many perishable foodstuffs such as meat, poultry, fish, vegetables, fruit, cheese, and eggs (Lounsbury 1986).

One of the most common merchants at the market would have been the butchers, who preferred the covered stalls of the market house to the carts and wagons used by the other vendors. Hooks and spikes, which hung from the overhanging eaves of the market building, were used to display the wares and help prevent rapid spoiling. Depending on the season and availability, meat products would have commonly included beef, veal, pork, mutton, and lamb. Farmers may have sold the animals directly to the public, or they may have sold them to butchers for cash or credit. Large sections of meat would probably have been displayed, and an additional fee would have been charged by the butcher to cut the portions into smaller pieces (Lounsbury 1986).

The earliest market that existed and served as the forerunner for Williamsburg was in the capital town of Jamestown. An act had been passed in 1649 that allowed for a market to be held twice a week between the hours of eight in

the morning and six in the afternoon (Hening 1819-1823:I:362). In 1699, the capital of the colony was moved from Jamestown to Williamsburg, which was then a small rural town. Hoping to turn Williamsburg into a thriving political arena and center of trade, the governor was again granted the right to hold a market. Despite this act and the act of 1705, which allowed the marketplace to be enlarged when needed, the popularity of a Williamsburg market did not easily take root. The small resident population and the availability of nearby farmlands were obstacles in Governor Spotswood's plan to establish a regular market.

Many of Williamsburg's residents preferred to produce their own produce on their own farmland. Robert Carter bought a farm in 1764 so that he too could have "the articles to be obtained in good markets" (Rowland 1893). Despite these obstacles, Governor Spotswood persisted in his endeavor by soliciting the House of Burgesses to provide support in the building of a permanent market house. Although this request was proposed in 1713, there was still no permanent market house by 1720 (Lounsbury 1986).

It is believed that on market square in Williamsburg there may have been several wooden structures that could have served as a market house before the 1750's. However, it was not until 1757 that a building was erected which served as the first recognized market house permitted to hold market six days a week. Located across from the court house and halfway

between the College and the Capital, the building was probably built on a brick foundation with overhanging eaves stemming from a hipped roof. By January 1764, the assembly had passed an act that was to provide funds for the market house and other public buildings that were in need of repair (Lounsbury 1986).

Although there seems to have been an effort to establish a stable marketplace, complaints about its produce in the late eighteenth-century raises questions about its popularity with the town's inhabitants. One vivid and famous description of the Williamsburg market system was provided by "Timothy Telltruth" in a Virginia Gazette editorial of 1768:

> In all well regulated cities and towns the utmost regard is paid to the health and circumstances of the inhabitants, by those in power enacting such laws as deter butchers, bakers, &c. from exposing any thing to sale but what is good in quality, and at a certain fixed rate. We of the good town of Williamsburg, metropolis of Virginia! have but too much reason to complain of being neglected in those particulars; for here meat for poverty not fit to eat, and sometimes almost spoiled, may hang in our market for hours, without any notice being taken of the vendors of it; and any person may ask what price for his commodity that his conscience will allow him, which is generally exorbitant enough, especially on publick times, or when little meat is at market. And if a man has not got money enough to purchase a whole quarter of meat, the butcher generally demands a penny a pound extraordinary to cut it. In the same manner we are treated about all other provisions, the feller always taking advantage when in his power. In Norfolk, I have heard that the markets are so regulated there that good meat must only bear such a price as the Magistrates think reasonable; and the butcher is obliged to cut his meat upon a farthing a pound being paid more than he demands the quarter. An example worthy of imitation. --And the bakers are suffered to make their bread of what weight they think proper, and to put such unwholesome ingredients into it, and bake it of such bad flower, as

> must be very prejudicial to the health of those who eat it. At this very juncture the bread they bake daily, and sell to the inhabitants, justly entitles them to the pillory, if they had their desserts. A good heavy fine, in all likelihood, would put a stop to their inquitous practices, so detrimental to the inhabitants...(Virginia Gazette, Purdie and Dixon, September 7, 1768).

Two years after "Timothy Telltruth's" descriptive complaints, several citizens of Williamsburg presented a petition to the House of Burgesses that would convert the abandoned guard house located near the powder magazine into a market house. It is not certain as to whether this request was presented due to the need for more market space or the need to replace the original market house, which may have been no longer standing. Advertisements that were published in the Virginia Gazette suggest that the market system was still active after the Revolution. There is not much known about the final phases of the market house except that by 1797, the brick powder magazine served as the principal market house until the 1830's, when a new structure on market square was built to house the produce.

The history of the market house and the accounts in the Virginia Gazette together suggest that the Williamsburg market was slowly beginning to take shape in the late eighteenth-century. In the concluding chapter, a comparison of the faunal material from the Everard and Randolph assemblages will show that there is an overall difference in the age of the animals consumed and that the urban elite were eating more young animals than the rural elite. This difference in the

rural and urban diet may be a reflection of the Williamsburg market economy becoming more specialized during the late eighteenth-century. Young animals may have been sent to market or were being sold by the town butchers in response to an urban demand. As was mentioned in Chapter V, the patterns of animal husbandry in the rural communities were also changing with the enforcement of laws regarding fences and trespassing of animals.

CHAPTER VII

CONCLUSIONS

To understand the consumer behavior of the market economy, the factors that can affect a consumer's decision must also be considered. There are numerous elements that affect an individual's choice, but the predominate one concerns the availability of the product (Bowen 1991; Huelsbeck 1991). As stated in the introduction to this thesis, the purpose of this study was to compare urban and rural faunal assemblages to determine factors that affected the availability of food products for the Everard and Randolph households. Particularly, how did the provisioning systems and herd management strategies evolve to accommodate the growth of urban communities. Since there are no surviving accounts on how the Everards and Randolphs were raising their cattle, pigs, and sheep, the faunal material was supplemented with diary accounts, farmers' articles, and laws that pertain to animal rearing in the late eighteenth-century and the early nineteenth-century. By combining the findings from all of the above sources, a clearer picture of the Chesapeake provisioning system and its relationship with the Williamsburg market has been drawn.

Comparison of these two assemblages shows that the diets

of urban consumers such as Thomas Everard did differ from their rural counterparts, such as Richard Randolph II. Based on the faunal material, it is evident that the Randolph family had direct access to food products that they were raising on their own plantation. The element distributions reveal both "waste" parts and "meaty" parts of cow and pigs, which suggests that the animals were being killed and consumed on the same site. The lack of some "waste" parts, such as the foot bones, in the sheep distributions may imply that the Randolphs were also acquiring or buying these animals from their neighbors or from family who had farms close by. Finally, the faunal material does reveal that the Randolphs had access to wild game and fish that they could have acquired in the surrounding woodlands and James river.

The Everards, who lived in Williamsburg, had an even greater range of possibilities from which to acquire food products. Like Richard Randolph II, Thomas Everard could have obtained domestic foodstuffs from one of his plantations or one of his friend's farms outside of town. Additional food sources included his property in town where he raised some animals and vegetables, and the local market, which offered a variety of food products. The element distributions, which revealed a disproportionate number of "meaty" cuts from domestic mammals, suggest that he purchased some of his animal products either from the market place or from local merchants. Additional testimony for Everard's participation in the urban

market comes from the evidence of cod and deep-water fish, which indicates that he acquired some of his fish products from the market. The evidence of wild mammals and the high percentage of wild birds could also indicate that Everard had access to wildlife either through the market place, through friends, or even hunting by himself in the surrounding woodland areas.

When studying historic faunal assemblages, the availability of certain foodstuffs and the availability of particular cuts of meat are affected by the type of animals being raised and the method of animal husbandry being applied. Since there are no other rural faunal assemblages to serve as a comparison, the Randolph material, combined with Landon Carter's diary accounts and the American Farmer, will serve as a data base line for determining what the elite planters of the late eighteenth-century were doing in regards to animal husbandry.

The late eighteenth-century represents a time of changing animal husbandry practices, as animals were being raised by some farmers for profit rather than for personal subsistence purposes. On some farms, the animals were no longer allowed to roam free but were confined by fences. Landon Carter, like other plantation holders of the time, was raising animals for food, both for his plantation and the market. Based on the kill-off patterns from the Curles Neck plantation, it appears that the Randolphs were also raising animals for food and

profit. The high percentage of older animals suggests that they were sending their younger animals to be sold to the butchers or to the market, while they consumed the older animals. Conversely, the kill-off patterns from the Everard site suggest that they had access to younger animals that they could have purchased at the market or butcher. Based on the combined faunal data, it is evident that as the animal husbandry techniques were becoming more specialized, the market was also beginning to become more specialized.

The distribution of the bone elements on the Everard site suggests that the Everards were acquiring some of their foodstuffs from a market-oriented procurement system. Although laws controlling butchering had not been passed in Williamsburg by the late eighteenth-century, the bones do suggest that a differential slaughter pattern was emerging as the market was becoming more standardized. The urban demands influenced not only the market system but also the patterns of rural animal husbandry. Farmers were beginning to change their practices in the production of livestock, so that they could send the most marketable animals to town to be sold.

Diversity of species and diversity of bone elements among an urban faunal assemblage are also strong indicators as to how the market economy was becoming specialized and utilized by the community. As the consumer became increasingly reliant on the market, the faunal sample was affected by having a decrease in the diversity of species and diversity of certain

anatomical elements (Rothschild 1989). The similarity of species between the two studied assemblages suggests that the Williamsburg market was still part of an open system, where urban dwellers could obtain both domestic and wild animals from the rural countryside.

Although there were some similarities between the assemblages, there were also differences that need to be addressed. In correlation with Elizabeth Reitz's study of urban and rural sites on the Southern Atlantic coast, the urban Everard site utilized a higher number of domestic species than its rural counterpart. The number of cattle remained consistent for each site, but pigs and sheep/goat's were more abundant on the Everard site than at Curles Neck. A higher consumption of domestic birds, particularly chicken, was seen in the Everard faunal material. This may suggest that they had easy access to poultry in the market or from their own urban property, since the laws did not restrict the animal husbandry of domestic fowl in urban areas.

The Everard material does differ from Reitz's findings in the utilization of fish on urban sites. From her findings, she discusses that fish were apparently not used in urban sites as extensively as they were in rural areas. She offers an explanation for this by pointing out that even though fish may not be visible in the faunal record, it does not always imply that fish did not make significant contributions to the urban or rural diet (1988). Salting or other methods of

preserving fish, which required filleting, often leave little or no faunal remains to be found archaeologically. On the Everard site though, thirteen fish were found as compared to the three at Curles Neck. Considering the preservation qualities of the ash layers and the location of Williamsburg between the James and York Rivers and its proximity to the Chesapeake Bay, it is not surprising that a variety of fish were discovered. It is unusual that such a small number of fish were identified at Curles Neck, since the Randolphs would have had access to the James River. This number may be a reflection of the preservation qualities of the site. It is interesting to note that one of the fish species identified in the Everard assemblage was a member of the cod family. Since cod are not native to the local waters, it can be assumed that the Randolphs probably purchased the fish from a local merchant or the Williamsburg market. Account records from the Governor's Palace show that fish, such as anchovies, catfish, drum, sheepshead, sturgeon, saltfish, shad, and rockfish were available for purchase in 1770 (Palace Account Books 1770).

Another finding that corresponds with Reitz's study is the distribution of wild mammals in the urban and rural diet. Neither site seems to have depended heavily on wild mammals, but the wild species on the Everard site did have less of a dietary contribution than on the rural site. This difference could be due to the identification of a butchered black bear femur at Curles Neck. The meat weight associated with the

bear raises the dietary contributions of wild mammals at Curles Neck site. If the bear is removed from the wild mammal category, the two sites become more equated in their meat contributions for wild mammals.

In summarizing all of the findings in the faunal and documentary research, it is apparent that in the late eighteenth-century the Williamsburg inhabitants were involved in a procurement system that was beginning to change from what had existed in the seventeenth-century. Farmers were beginning to shift the focus of animal husbandry techniques from subsistence to profit oriented. Reflecting this change, the market began to become more specialized to meet the urban demands.

From the studied faunal assemblages, it is apparent that the Everards acquired both domestic and wild animals from a variety of sources including their plantations, their neighbors farms, their property in town, and the market. The primary food resources for the Randolphs were the domestic animals that they probably acquired from their own plantation, although the remoteness of the Curles Neck site would suggest that they would have also utilized the environment around them and acquire wild animals for food. Whereas there was a small percentage of wild species, the unusual presence of the butchered black bear bone has incited new thoughts on the proximity of black bears to the tidewater region in the late eighteenth-century.

There are many complexities and variables involved in the interpretation of faunal material. The assemblages can not always measure the changes that occur in a family's composition, size, age categories, and economic influence. The personal cooking preferences of a cook or the use of a refuse pit by both the slaves and the main family can often affect how the zooarchaeologist translates the foodway patterns. As these biases and variables are defined with more research, zooarchaeology will be able to provide better insights into the study of economic patterns. Particularly, as more assemblages are studied the relationship of the Williamsburg consumer to its rural producers will be reconstructed in the context of the market system.

APPENDIX A.

OSTEOLOGICAL MEASUREMENTS

During the identification process, all possible skeletally-adult bones were measured from the Curles Neck assemblage. The Study of Animal Bones from Archaeological Site (von den Dreisch 1976) was used as the reference text and source for terminology.

TAXON	ELEMENT	DIMENSION	MEASUREMENT
Bos taurus	Mandible	3	123.6
		9	49.4
		12	154.1
		13	156.3
		15B	44.7
		15C	33.4
	Cervical vertebra	BPacd	66.0
		BPacr	69.5
		GLPa	78.1
		GLPa	69.5
		GLPa	65.8
		HFcr	26.8
		PL	54.9
		PL	43.1
	Thoracic vertebra	GLPa	26.0
		PL	26.3
	Lumbar vertebra	BFcd	63.9
		BFcr	41.7
		Bfcr	48.9
		BPacd	54.9
		BPacd	45.3
		BPacr	61.5
		BPacr	75.4
		BPacr	57.4
		GLPa	86.3
		GLPa	78.7
		HFcd	34.4
		HFcd	35.0
		HFcr	32.4
		HFcr	36.8
		HFcr	32.6
		PL	56.4
		PL	57.7
	Sacral vertebra	BFcr	42.1
		BFcr	43.4
		HFcr	19.8
	Sacrum	HFcr	12.8
	Innominate	HFcf	24.4
		GBA	44.4
		GBA	50.3
		LA	69.4
		LA	73.3
		LFO	91.6
		SB	26.5

TAXON	ELEMENT	DIMENSION	MEASUREMENT
	Innominate	SH	52.3
		SH	45.5
	Scapula	BG	48.4
		BG	52.4
		BG	47.8
		BG	43.8
		GL	66.0
		GLP	69.7
		GLP	77.3
		GLP	71.6
		GLP	61.4
		LG	58.2
		LG	67.9
		LG	64.3
		LG	58.5
		SLC	54.9
		SLC	59.7
		SLC	55.2
	Humerus	BT	78.9
		Bd	81.8
		Bd	14.6
		Bp	11.3
		GB	45.7
		GL	111.4
		GL	23.6
		SD	35.9
		SD	34.8
		SD	13.8
	Ulna	BPC	40.5
		DPA	73.2
		LO	100.2
		SDD	59.0
	Radius	Bp	69.1
		Bp	94.9
		SD	44.2
		SD	41.5
		SD	47.3
	Main metacarpal	Bd	62.4
		Bd	59.4
		Bd	61.8
		Bd	51.4
		Bd	63.0
		Bd	53.7
		Bp	53.5
		Bp	50.3
		Bp	48.7
		Bp	60.1
		Bp	57.2
		Bp	61.0

TAXON	ELEMENT	DIMENSION	MEASUREMENT
	Main metacarpal	Bp	52.0
		Bp	50.4
		Bp	51.3
		Bp	57.6
		Bp	50.7
		DD	22.6
		DD	20.8
		DD	23.5
		DD	22.4
		DD	22.0
		DD	21.4
		DD	20.8
		GL	192.7
		SD	32.2
		SD	29.0
		SD	37.0
		SD	33.6
		SD	28.1
		SD	31.5
		SD	29.7
	Metacarpal III	GB	46.0
		L	37.6
	Femur	BP	83.1
		BP	85.8
		Bd	89.O
		DC	48.6
		SD	40.8
		SD	44.0
		SD	34.7
		SD	42.7
		SD	31.5
	Tibia	Bd	67.0
		Bd	56.0
		SD	41.2
		SD	40.0
		SD	40.7
		SD	37.7
	Calcaneus	GB	53.3
		GB	56.2
		GB	53.2
		GB	51.8
		GB	51.1
		GL	120.3
		GL	143.1
		GL	142.9
		GL	126.0
	Astragalus	Bd	42.4
		Bd	43.3
		Bd	38.3

TAXON	ELEMENT	DIMENSION	MEASUREMENT
	Astragalus	DM	37.0
		DM	34.8
		Dl	36.7
		Dl	39.4
		Dl	36.8
		GLl	65.6
		GL1	67.4
		GLm	61.6
		GLm	62.2
		GLm	56.9
	Fused tarsal c+4	GB	55.8
		GB	67.8
		GB	55.5
		GB	55.3
	Fused tarsal 2+3	GB	44.6
		GB	38.2
		GB	41.0
	Main metatarsal	Bd	58.4
		Bd	52.2
		Bd	49.9
		Bd	47.7
		Bd	48.8
		Bd	54.7
		Bp	55.0
		Bp	42.1
		Bp	44.7
		Bp	41.4
		Bp	41.4
		Bp	49.4
		Bp	45.2
		Bp	49.4
		DD	30.1
		DD	26.5
		DD	25.5
		DD	31.2
		DD	24.4
		DD	29.6
		DD	24.2
		DD	25.0
		DD	29.8
		DD	29.2
		DD	25.3
		DD	29.9
		DD	22.6
		GL	194.9
		SD	32.2
		SD	25.4
		SD	32.4
		SD	30.7

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Main metatarsal	SD	23.5
		SD	26.7
		SD	28.4
		SD	27.0
		SD	28.9
		SD	32.2
		SD	25.7
		SD	28.6
		SD	29.1
		Bd	27.8
	First phalanx	Bd	25.2
		Bd	26.6
		Bd	39.3
		Bd	23.5
		Bd	25.8
		Bp	33.4
		Bp	26.9
		Bp	29.8
		Bp	37.6
		Bp	26.2
		GL	56.5
		GLpe	65.5
		GLpe	51.1
		GLpe	65.0
		GLpe	71.5
		GLpe	61.2
		SD	29.7
		SD	21.5
		SD	25.0
		SD	24.6
		SD	34.8
		SD	21.7
		SD	21.8
	Second phalanx	Bd	20.7
		Bd	27.9
		Bd	24.4
		Bd	22.9
		Bd	28.4
		Bd	23.5
		Bd	22.8
		Bd	21.6
		Bd	24.4
		Bp	30.3
		Bp	36.9
		Bp	33.8
		Bp	27.0
		Bp	31.9
		Bp	34.1
		Bp	29.3

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Second phalanx	Bp	28.3
		Bp	27.5
		GL	41.0
		GL	44.0
		GL	42.6
		GL	41.6
		GL	45.5
		GL	49.4
		GL	34.2
		GL	39.6
		GL	45.9
		SD	22.8
		SD	29.8
		SD	27.5
		SD	21.7
		SD	25.7
		SD	26.9
		SD	21.0
		SD	22.3
		SD	23.3
	Third phalanx	Bd	22.9
		Bd	28.4
		Bp	25.1
		Bp	28.4
		DLS	72.2
		DLS	65.4
		DLS	76.5
		DLS	71.1
		GLpe	61.1
		GLpe	57.8
		Ld	55.0
		Ld	55.6
		Ld	53.0
		Ld	53.7
		Ld	56.5
		MBS	26.9
		MBS	28.3
		MBS	21.3
		MBS	20.9
		MBS	21.1
		MBS	28.6
		MBS	25.5
		MBS	29.5
		SD	22.4
		SD	27.7
Sus scrofa	Mandible	10B	13.9
		10B	14.0
		10B	34.6
		10B	13.9

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Mandible	10L	30.0
		10L	31.1
		10L	14.5
		10L	33.2
		13	99.6
		14	90.0
		16A	45.1
		16A	49.9
		16B	38.2
		16B	39.0
		16C	35.1
		16C	42.1
		21	13.4
		21	15.5
		21	11.4
		3	71.8
		5	161.0
		6	115.0
		7	111.6
		8	60.4
		8	62.7
		9	47.7
		9A	42.0
		9A	33.4
	Lower incisor 1	SD	12.7
	Canine	10B	17.2
	Lower canine	21	14.9
		21	19.7
		21	17.0
		21	13.4
		21	15.6
		21	15.8
		21	16.3
		21	15.6
		21	16.3
		21	11.6
		21	17.1
		21	21.5
		21	19.4
		21	15.2
		21	14.5
		21	15.2
	Molar	10B	15.3
		10B	14.2
		10L	32.2
	Upper molar 3	10B	14.1
		10B	14.2
	Lower molar 3	10B	16.0
		10B	14.9

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Scapula	10B	13.9
		10L	24.6
		10L	29.9
	Atlas	BFer	57.0
		H	49.7
		LAD	21.8
		BG	17.9
		BG	22.6
		BG	23.8
		GLP	26.6
		GLP	31.8
		GLP	37.0
		LG	26.8
		LG	31.4
		SLC	22.4
	Scapula	SLC	18.0
	Humerus	10B	15.I
		10L	31.7
		16A	51.8
		16B	44.4
		16C	47.2
		7A	103.2
		8	66.4
		9A	35.0
		BT	30.4
		Bd	43.0
		Bd	32.6
		Bd	37.2
		Bd	34.7
		Bp	34.1
		SD	14.3
		SD	15.5
		SD	23.4
		SD	13.3
		SD	15.3
		SD	12.5
		SD	15.4
	Ulna	BPC	20.6
		BPC	20.0
		DPA	36.7
		DPA	29.5
		LO	40.2
		SDO	24.7
	Radius	BP	29.2
		SD	19.0
	Metacarpal III	B	14.0
		B	12.7
		B	12.8
		B	11.5

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Metacarpal III	B	11.4
		B	13.4
		Bd	12.6
		Bd	15.7
		Bd	10.4
		Bd	12.8
		Bp	15.6
		Bp	15.6
		Bp	19.9
		Bp	13.6
		Bp	40.7
		Bp	18.1
		Bp	15.0
		GL	64.6
		GL	59.7
		GL	62.2
		LeP	55.1
		LeP	60.5
		SD	22.0
	Metacarpal IV	B	15.1
		B	11.1
		Bd	15.5
		Bp	17.7
		Bp	23.5
		GL	54.8
		LeP	52.4
	Metacarpal V	B	6.9
		Bd	12.4
		Bp	11.1
		GL	51.9
		LeP	49.9
	Femur	SD	20.0
		SD	19.9
		SD	20.2
		SD	18.8
		SD	21.4
		SD	32.9
		SD	22.8
		SD	19.5
	Tibia	Bd	28.5
		Bp	41.2
		GL	96.6
		SD	21.5
		SD	22.6
		SD	20.0
		SD	21.7
	Metatarsal III	B	14.0
		B	14.3
		B	15.0

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Metatarsal	Bd	12.4
		Bp	12.1
		Bp	12.9
		Bp	15.8
		Bp	17.4
		LeP	66.6
	Metatarsal IV	B	12.5
		B	14.6
		B	9.0
		B	13.8
	Metatarsal IV	Bd	15.3
		Bd	19.9
		Bd	12.9
		Bp	14.8
		Bp	14.7
		Bp	6.1
		Bp	17.2
		GL	61.4
		GL	74.8
	Metatarsal	GL	52.3
		LeP	60.3
		LeP	72.0
		LeP	50.1
	First phalanx	Bd	14.9
		GL	29.4
		GLpe	29.9
		SD	13.5
	Second phalanx	Bd	12.6
		Bp	11.7
		GLpe	26.0
		SD	15.3
	Third phalanx	DLS	32.3
		Ld	29.3
		MBS	14.4
Ovis aries/ Capra hircus	Mandible	10B	8.6
		10L	23.9
		15b	21.9
		15c	12.1
		7	79.4
		8	51.6
		9	22.6
	Lumbar vertebra	BFcd	25.4
		BFcd	23.4
		BFcr	23.0
		BFcr	21.3
		BPacd	11.6
		BPacd	10.9
		BPacd	13.4
		BPacr	24.5

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Lumbar vertebra	BPacr	23.0
		BPacr	22.2
		GLPa	51.2
		GLPa	51.3
		GLPa	54.9
		H	66.4
		H	65.0
		HFcd	12.8
		HFcd	13.0
		HFcr	20.0
		HFcr	12.3
		PL	32.0
		PL	31.9
		PL	23.3
	Humerus	BT	31.2
		BT	32.4
		BT	30.3
		Bd	32.6
		Bd	33.1
		Bd	31.0
		Bd	32.2
		SD	11.3
		SD	13.8
	Calcaneus	GB	15.7
		GB	11.6
		GL	98.6
		GL	66.4
Odocoileus virginia	Axis	BFcd	26.7
		BFcr	49.3
		BPacd	39.9
		H	64.9
		LAPe	70.2
		LCDe	65.7
		SBY	31.5
	Cervical Vertebra	BFcd	19.5
		BFcd	25.9
		BFcr	12.4
		BFcr	13.2
		BPacd	52.5
		BPacd	46.6
		BPacr	50.6
		BPacr	49.4
		BPtr	67.0
		GLPa	61.3
		GLPa	61.6
		GLPa	53.6
		H	45.5
		H	43.4
		HFcd	22.4

TAXON	ELEMENT	DIMENSIONS	MEASUREMENT
	Cervical Vertebra	HFcd	24.6
		HFcr	23.9
		HFcr	19.4
		PL	40.4
		PL	46.4
		PL	40.6
	Scapula	BG	22.6
		GLP	28.4
		HS	159.4
		LG	22.6
		SLC	21.8
	Humerus	SD	11.8
		SD	27.5
	Tibia	Bd	31.4
		Bd	28.5
		Bd	26.5
		Dd	27.0
		Dd	21.4
		Dd	21.7
		SD	20.6
		SD	11.4
		SD	14.5
	First phalanx	Bd	11.3
		Bd	11.7
		Bp	14.5
		Bp	14.6
		GL	43.9
		GLpe	42.1
		SD	11.3
		SD	10.7

APPENDIX B.

AGE GROUPS FOR DOMESTIC ANIMALS

AGE GROUPS
CURLES NECK

Bos taurus (Domestic Cow)

Age of Fusion - 7 to 18 Months		
Bone and Epiphysis	Fused	Not Fused
Scapula	4	1
Humerus - distal	3	0
Radius - proximal	4	0
First Phalange - proximal	0	0
Second Phalange - proximal	7	0
	18	1
Percent of Age Range	94.7%	5.3%

Age of Fusion - 24 to 36 Months		
Bone and Epiphysis	Fused	Not Fused
Metacarpal - distal	20	1
Tibia - distal	2	0
Metatarsal - distal	13	1
Calcaneus	5	2
Metapodial - distal	3	1
	43	5
Percent of Age Range	89.6%	10.4%

Age of Fusion - 36 to 48 Months		
Bone and Epiphysis	Fused	Not Fused
Radius - distal	0	0
Ulna - proximal and distal	2	0
Femur - proximal	1	3
Femur - distal	0	5
Tibia - proximal	0	1
Humerus - proximal	0	2
	3	11
Percent of Age Range	21.4%	78.6%

Source of Fusion Ages: Silver 1969: 285-286; Chaplin 1970: 128-133.

AGE GROUPS
THOMAS EVERARD

Bos taurus (Domestic Cow)

Age of Fusion - 7 to 18 Months		
Bone and Epiphysis	Fused	Not Fused
Scapula	5	1
Humerus - distal	3	3
Radius - proximal	5	0
First Phalange - proximal	0	0
Second Phalange - proximal	4	1
	17	5
Percent of Age Range	77.3%	22.7%

Age of Fusion - 24 to 36 Months		
Bone and Epiphysis	Fused	Not Fused
Metacarpal - distal	1	1
Tibia - distal	5	7
Metatarsal - distal	4	0
Calcaneus	3	8
Metapodial - distal	0	0
	13	16
Percent of Age Range	44.8%	55.2%

Age of Fusion - 36 to 48 Months		
Bone and Epiphysis	Fused	Not Fused
Radius - distal	1	1
Ulna - proximal and distal	1	4
Femur - proximal	2	5
Femur - distal	3	4
Tibia - proximal	0	1
	8	21
Percent of Age Range	27.6%	72.4%

Source of Fusion Ages: Silver 1969:285-286; Chaplin 1970: 128- 133.

AGE GROUPS
THOMAS EVERARD

Sus scrofa (Domestic Pig)

Age of Fusion - 0 to 12 Months		
Bone and Epiphysis	Fused	Not Fused
Radius - proximal	5	6
Humerus - distal	2	2
Second phalange - proximal	10	0
Scapula	12	5
	29	13
Percent of Age Range	69.0%	31.0%

Age of Fusion - 12 to 30 Months		
Bone and Epiphysis	Fused	Not Fused
Metacarpal - distal	0	11
First phalange - proximal	0	0
Tibia - distal	1	9
Metatarsal - distal	1	14
Calcaneus	2	5
Fibula - distal	0	0
Metapodial - distal	0	4
	4	43
Percent of Age Range	8.5%	91.5%

Age of Fusion - 30 to 42 Months		
Bone and Epiphysis	Fused	Not Fused
Ulna - proximal and distal	1	10
Humerus - proximal	0	1
Radius - distal	0	1
Femur - proximal and distal	0	5
	1	17
Percent of Age Range	5.6%	94.4%

Source of Fusion Ages: Silver 1969:285-286; Chaplin 1970: 128- 133.

AGE GROUPS
CURLES NECK

Sus scrofa (Domestic Pig)

Age of Fusion - 0 to 12 Months		
Bone and Epiphysis	Fused	Not Fused
Radius - proximal	2	0
Humerus - distal	3	1
Second phalange - proximal	1	1
Scapula	7	0
	13	2
Percent of Age Range	86.7%	13.3%

Age of Fusion - 12 to 30 Months		
Bone and Epiphysis	Fused	Not Fused
Metacarpal - distal	4	9
First phalange - proximal	0	0
Tibia - distal	0	1
Metatarsal - distal	2	8
Calcaneus	1	0
Fibula - distal	0	0
Metapodial - distal	0	2
	7	20
Percent of Age Range	25.9%	74.1%

Age of Fusion - 30 to 42 Months		
Bone and Epiphysis	Fused	Not Fused
Ulna - proximal and distal	0	3
Humerus - proximal	0	1
Radius - distal	1	0
Femur - proximal and distal	1	1
	2	5
Percent of Age Range	28.6%	71.4%

Source of Fusion Ages: Silver 1969:285-286; Chaplin 1970: 128- 133.

AGE GROUPS
THOMAS EVERARD

Ovis aries/Capra hircus (Domestic Sheep or Goat)

Age of Fusion - 6 to 18 Months

Bone and Epiphysis	Fused	Not Fused
Scapula	11	0
Humerus - distal	6	2
Radius - proximal	5	1
First Phalange - proximal and distal	0	0
Second Phalange - distal	0	0
	22	3
Percent of Age Range	88.0%	12.0%

Age of Fusion - 18 to 30 Months

Bone and Epiphysis	Fused	Not Fused
Ulna - proximal and distal	1	2
Metacarpal - distal	0	0
Metatarsal - distal	0	0
Metapodial - distal	0	0
Tibia - distal	3	2
	4	4
Percent of Age Range	50.0%	50.0%

Age of Fusion - 30 to 42 Months

Bone and Epiphysis	Fused	Not Fused
Humerus - proximal	0	0
Radius - distal	4	2
Calcaneus	4	2
Femur - proximal and distal	2	3
Tibia - proximal	1	5
	11	12
Percent of Age Range	47.8%	52.2%

Source of Fusion Ages: Silver 1969:285-286; Chaplin 1970: 128- 133.

AGE GROUPS
CURLES NECK

Ovis aries/Capra hircus (Domestic Sheep or Goat)

Age of Fusion - 6 to 18 Months

Bone and Epiphysis	Fused	Not Fused
Scapula	0	0
Humerus - distal	6	0
Radius - proximal	0	1
First Phalange - proximal and distal	0	0
Second Phalange - distal	0	0
	6	1
Percent of Age Range	85.7%	14.3%

Age of Fusion - 18 to 30 Months

Bone and Epiphysis	Fused	Not Fused
Ulna - proximal and distal	0	0
Metacarpal - distal	0	0
Metatarsal - distal	0	0
Metapodial - distal	0	0
Tibia - distal	3	0
	3	1
Percent of Age Range	75.0%	25.0%

Age of Fusion - 30 to 42 Months

Bone and Epiphysis	Fused	Not Fused
Humerus - proximal	0	0
Radius - distal	1	0
Calcaneus	3	0
Femur - proximal and distal	0	0
Tibia - proximal	1	1
	5	3
Percent of Age Range	62.5%	37.5%

Source of Fusion Ages: Silver 1969:285-286; Chaplin 1970: 128- 133.

APPENDIX C.

ELEMENT DISTRIBUTION FOR DOMESTIC ANIMALS

ELEMENT DISTRIBUTION
CURLES NECK

Bos taurus (Domestic Cow)

Element Type	No.	Percentage
Skull	22	6.7%
Antler	0	0.0%
Mandible	11	3.3%
Tooth	18	5.5%
Vertebra	40	12.1%
Rib	7	2.1%
Innominate	16	4.8%
Scapula	15	4.5%
Humerus	26	7.9%
Ulna	4	1.2%
Radius	9	2.7%
Carpal	1	0.3%
Metacarpal	27	8.2%
Femur	26	7.9%
Tibia	13	3.9%
Fibula	0	0.0%
Tarsal	20	6.1%
Metatarsal	27	8.2%
Metapodial	7	2.1%
Phalange	37	11.2%
Sesamoid	0	0.0%
Other	4	1.2%
TOTAL	330	100.0%

ELEMENT DISTRIBUTION
THOMAS EVERARD

Bos taurus (Domestic Cow)

Element Type	No.	Percentage
Skull	31	6.0%
Antler	1	0.2%
Mandible	21	4.0%
Tooth	30	5.8%
Vertebra	120	23.1%
Rib	18	3.5%
Innominate	31	6.0%
Scapula	47	9.0%
Humerus	21	4.0%
Ulna	15	2.9%
Radius	19	3.7%
Carpal	8	1.5%
Metacarpal	4	0.8%
Femur	38	7.3%
Tibia	42	8.1%
Fibula	0	0.0%
Tarsal	31	6.0%
Metatarsal	13	2.5%
Metapodial	4	0.8%
Phalange	14	2.7%
Sesamoid	1	0.2%
Other	11	2.1%
TOTAL	520	100.0%

ELEMENT DISTRIBUTION
CURLES NECK

Sus scrofa (Domestic Pig)

Element Type	No.	Percentage
Skull	11	2.8%
Antler	0	0.0%
Mandible	42	10.8%
Tooth	204	52.4%
Vertebra	7	1.8%
Rib	0	0.0%
Innominate	12	3.1%
Scapula	12	3.1%
Humerus	14	3.6%
Ulna	6	1.5%
Radius	8	2.1%
Carpal	2	0.5%
Metacarpal	17	4.4%
Femur	14	3.6%
Tibia	10	2.6%
Fibula	5	1.3%
Tarsal	3	0.8%
Metatarsal	15	3.9%
Metapodial	3	0.8%
Phalange	11	2.8%
Sesamoid	0	0.0%
Other	0	0.0%
TOTAL	389	100.0%

ELEMENT DISTRIBUTION
THOMAS EVERARD

Sus scrofa (Domestic Pig)

Element Type	No.	Percentage
Skull	66	10.5%
Antler	0	0.0%
Mandible	76	12.1%
Tooth	139	22.1%
Vertebra	31	4.9%
Rib	6	1.0%
Innominate	24	3.8%
Scapula	33	5.2%
Humerus	22	3.5%
Ulna	22	3.5%
Radius	25	4.0%
Carpal	6	1.0%
Metacarpal	25	4.0%
Femur	25	4.0%
Tibia	26	4.1%
Fibula	12	1.9%
Tarsal	14	2.2%
Metatarsal	32	5.1%
Metapodial	4	0.6%
Phalange	40	6.3%
Sesamoid	1	0.2%
Other	1	0.2%
TOTAL	630	100.0%

ELEMENT DISTRIBUTION
CURLES NECK

Ovis aries/*Capra hircus* (Domestic Sheep or Goat)

Element Type	No.	Percentage
Skull	3	6.7%
Antler	0	0.0%
Mandible	3	6.7%
Tooth	3	6.7%
Vertebra	5	11.1%
Rib	0	0.0%
Innominate	4	8.9%
Scapula	2	4.4%
Humerus	10	22.2%
Ulna	2	4.4%
Radius	4	8.9%
Carpal	0	0.0%
Metacarpal	0	0.0%
Femur	2	4.4%
Tibia	5	11.1%
Fibula	0	0.0%
Tarsal	3	6.7%
Metatarsal	0	0.0%
Metapodial	0	0.0%
Phalange	0	0.0%
Sesamoid	0	0.0%
Other	0	0.0%
TOTAL	45	100.0%

ELEMENT DISTRIBUTION
THOMAS EVERARD

Ovis aries/*Capra hircus* (Domestic Sheep or Goat)

Element Type	No.	Percentage
Skull	11	5.4%
Antler	0	0.0%
Mandible	4	2.0%
Tooth	21	10.3%
Vertebra	38	18.6%
Rib	9	4.4%
Innominate	27	13.2%
Scapula	18	8.8%
Humerus	11	5.4%
Ulna	7	3.4%
Radius	15	7.4%
Carpal	1	0.5%
Metacarpal	1	0.5%
Femur	10	4.9%
Tibia	14	6.9%
Fibula	0	0.0%
Tarsal	13	6.4%
Metatarsal	0	0.0%
Metapodial	0	0.0%
Phalange	3	1.5%
Sesamoid	0	0.0%
Other	1	0.5%
TOTAL	240	100.0%

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