WHAT LADIES AND GENTLEMEN ATE FOR DINNER: THE ANALYSIS OF FAUNAL MATERIALS RECOVERED FROM A SEVENTEENTH-CENTURY HIGH-STATUS ENGLISH HOUSEHOLD, FERRYLAND, NEWFOUNDLAND

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by

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Abstract

This thesis presents an analysis of the faunal remains recovered from various deposits associated with a complex of buildings known as the Mansion House from the seventeenth-century fishing settlement of Ferryland, Newfoundland. These buildings were built sometime between 1623 and 1625 by English settlers to serve as the residence of their colonial sponsor George Calvert (later the first Lord Baltimore). The complex included a two-storey main residence built of stone, an enclosed cobblestone courtyard and two auxiliary stone structures, one of which contained an 8 by 8 foot cellar. Calvert only resided in Ferryland for a little more than a year before leaving the colony. The Mansion House eventually came to serve as the residence of Newfoundland Governor Sir David Kirke and his family in 1638. Kirke built another house for himself sometime in the 1640s. The size, quality and location of the Mansion House meant that it would have been highly valued property even after the departure of the Governor and archaeological evidence suggests a high-status occupation during the second half of the seventeenth century. The discovery of the Mansion House, its well defined context and connection to high status individuals provides the opportunity to explore food consumption patterns of a high-status household of the early colonization period in seventeenth-century North America. The goal of this thesis is to describe the diet and foodways of the Mansion House's former inhabitants. The results are then compared to faunal analyses of other assemblages in Ferryland.

An abundance of faunal remains were recovered from the Mansion House in a fairly well preserved state relative to the low numbers and the poor condition of faunal remains normally recovered in Ferryland. This is believed to be a direct result of the limestone used in the construction of the stone buildings having an effect on the pH levels of the soil and allowing for better preservation. Information on the local natural environment and historical foodways of the English in the seventeenth century is used to guide the interpretations of the faunal remains. Results show that the residents of the Mansion House during the second half of the seventeenth century enjoyed meals primarily based on the consumption of mammals (both wild and domestic) and fish with a regular inclusion of birds. The Mansion House inhabitants appear to have consumed more beef than residents in other areas of the site as well as certain species of birds. These and various other differences found between the Mansion House assemblage and the other areas of the site are related to differential preservation conditions and to the limitations imposed onto the residents of the community by the seasonal cod fishery and the important role it played in the everyday lives of Ferryland residents.

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Chapter 1: Introduction

In the summer of 2005, after more than 13 years of excavations, archaeologists working at the seventeenth-century settlement of Ferryland, on the south-east coast of Newfoundland's Avalon Peninsula, uncovered a structure they had wanted to find for a long time. It was the Mansion House, a complex of buildings first built sometime between 1623 and 1625 to serve as the residence of Sir George Calvert (later the first Lord Baltimore), for what was his first attempt at establishing an English colony in North America. Ferryland's history is a fairly well documented one, both in the historical and archaeological records. The Mansion House, one of the most prominent structures in the community during the seventeenth century, played an important role in that history as a home to the region's most wealthy and powerful historical figures. Its discovery provides us with the opportunity to better understand what life was like for an elite household during the earliest years of permanent English settlement in Newfoundland. Many of the thousands of artefacts recovered from the various deposits associated with this structure reflect a high-status occupation. This research project interests itself with the animal bones recovered from the Mansion House deposits. Fortunately, the limestone plaster used to line the interior walls of the building is thought to have drastically altered the pH levels of the soil thus creating better preservation conditions for organic materials at a site where faunal remains are generally very poorly preserved. An unexpected and relatively large sample of faunal remains was recovered from the Mansion House.

The research goal for this project is to analyze the faunal remains recovered from the Mansion House in order to describe the diet and foodways of those who first deposited them. This study takes advantage of the opportunities presented by the large, well preserved sample of animal bones in relation to the well defined context of the Mansion House and the known socio-economic status of those who are most likely to have deposited the remains. This research also aims to further understand the general dietary patterns, foodways and animal husbandry practices of seventeenth-century Ferryland, thus building upon the work previously performed by Lisa Hodgetts (2006, 2009).

The development of this research began within the theoretical framework of consumption theory and the idea that those of higher socio-economic status will possess greater quantities of more expensive material goods than households of lower socio-economic status. Such consumer behaviour is equally applicable towards the consumption of food as it is the consumption of material goods. Studies looking at the translation of wealth into the zooarchaeological record are popular for North American historic sites (e.g., (Lyman 1977, 1979; Milne and Crabtree 2001; Schulz and Gust 1983; Singer 1985, 1987), but few look at the early colonization period and none of them look at the colonial history of Newfoundland. The discovery of the Mansion House, its well defined context and connection to high status individuals provides the opportunity to explore the food consumption patterns of a single high-status household in the early colonization period of seventeenth-century North America.

1.1 Research Questions

The study of seventeenth-century European settlements in Newfoundland plays an important role in understanding the history of colonization in the region; however, little information is available on the diet and foodways of the settlers during this time period. Documentary records can only provide so much information and therefore we must turn to the archaeological record to fill in the gaps. A series of objective research questions were set up prior to the undertaking of this study in order to better guide the research. The organization of these research questions is intended to first describe the data and then allow for contrasts and comparisons to be made in order to best interpret the results. These questions are:

1. **What are the characteristics of the Mansion House's faunal assemblage?**

   A basic zooarchaeological analysis of the faunal material recovered from the Mansion House is required to answer this question whereby I will investigate which species are present, the nature of their distribution, preservation, taphonomic alterations and perform other analyses of a descriptive nature.

2. **What does the faunal data tell us about the diet and foodways of the Mansion House's inhabitants?**

   The answer to this question is based on the results of the faunal analyses described in the first research question. Answering this question will provide information on which identified species were primarily consumed by people. The importance of an animal's contribution to the diet depends on a number of factors such as the frequency of its presence in the assemblage and evidence for disarticulation and butchery by human beings.

3. **How does the Mansion House faunal assemblage compare to those from other areas of the site as described in Hodgetts (2006, 2009)?**

   This question asks if there is a difference between the diet and foodways of the residents of the Mansion House and what we know of the diet and foodways of other residents of the site based on faunal analyses conducted by Lisa Hodgetts on deposits from four other areas in Ferryland.

4. **Can any of the observed differences between the Mansion House assemblage and those from other areas of the site, if any, be a reflection of the higher socio-economic status of its residents? If not, how best can we explain these differences?**

   This question requires the interpretation of any observed differences between the Mansion House deposit and other areas of the site. The one thing known to differentiate the Mansion House deposit from the others is the higher socio-economic status of its occupants. Therefore any difference between the deposits may naturally be assumed to be the result of differential status. This is not necessarily the case and in order to properly address this research question, I need to consider the social, environmental, depositional, historical and economical contexts imposed onto the assemblage, make comparisons to other zooarchaeological studies that address similar issues and make proper use of theoretical paradigms.

1.2 Organization of the Thesis

The first three chapters following this introduction each present the relevant background information needed to properly understand and interpret the faunal remains. Chapter 2 describes the location, geological history and environment of the Ferryland area as well as the region's climate, flora and fauna. It also provides historical accounts from some of Ferryland's residents and visitors that detail historical perspectives on the land, its uses, opinions on the weather and reports of European exploits of the local resources.

Chapter 3 is all about history and theory. It provides the reader with pertinent historical information relating to Ferryland, the Newfoundland fishery, English social structure and seventeenth-century English diet and foodways. Included in this section are historical accounts of arable and animal agriculture in Ferryland and a discussion of the theoretical approach adopted in this thesis.

Archaeology is the main subject of Chapter 4 where I focus on the Mansion House, providing the reader with a history of the building followed by a discussion regarding its construction, design and excavation. Descriptions of the various deposits that make up the Mansion House assemblage are considered alongside dating information when available. Other research projects investigating diet or foodways at the site are also presented here.

Chapter 5 explains in detail the methods and procedures employed to analyze the faunal remains. The chapter begins with a description of the identification process followed by an account of how I went about ageing, sexing and quantifying the animal bones. Each discussion is accompanied by a brief literature review and reasoning as to why certain methods were applied to this particular research project.

The results of the faunal analyses described in Chapter 5 and, therefore, the answers to the first research question, are provided in the form of various tables and figures in Chapter 6. Results are clearly presented and objectively described according to the form of analysis that produced them. Included are measures of species abundance, body portion distributions, butchery analyses, age at death profiles and taphonomic analyses.

The penultimate chapter is an interpretation of those results. It begins by addressing the state of preservation of the assemblage and to what extent it is representative of what was originally deposited on the site. A discussion on each species or group of animals identified in the faunal assemblage combines all of the relevant background information with the results of the faunal assemblage. New information on general animal husbandry practices in Ferryland is discussed followed by an interpretation as to why the Mansion House deposit is different from some of the other areas at the site.

The concluding chapter is a brief summary of the goals set out in this research project and the extent to which this research was able to achieve them. It also explores future research avenues that could be undertaken to further understand some of the questions set out in this project.

Chapter 2: Geography and Ecological Background

2.1 Location and Geography

Ferryland is located approximately 80 kilometres south of the provincial capital of St. John's along the coast of Newfoundland's Avalon Peninsula (Figure 1a). The majority of the community's extant population of about 750 people reside along the coast with a few residents settled on the Ferryland Peninsula (Gaulton 2006: 21) which stretches out almost two and a half kilometres into the Atlantic ocean (Figure 1b). The archaeological site itself is located on the northern shore of the peninsula, along an inner harbour known as "The Pool", a sheltered area formed by a small extension of the Ferryland Peninsula that provides protection to any fishing vessel anchored there during bad weather or rough seas. The nature of the community's

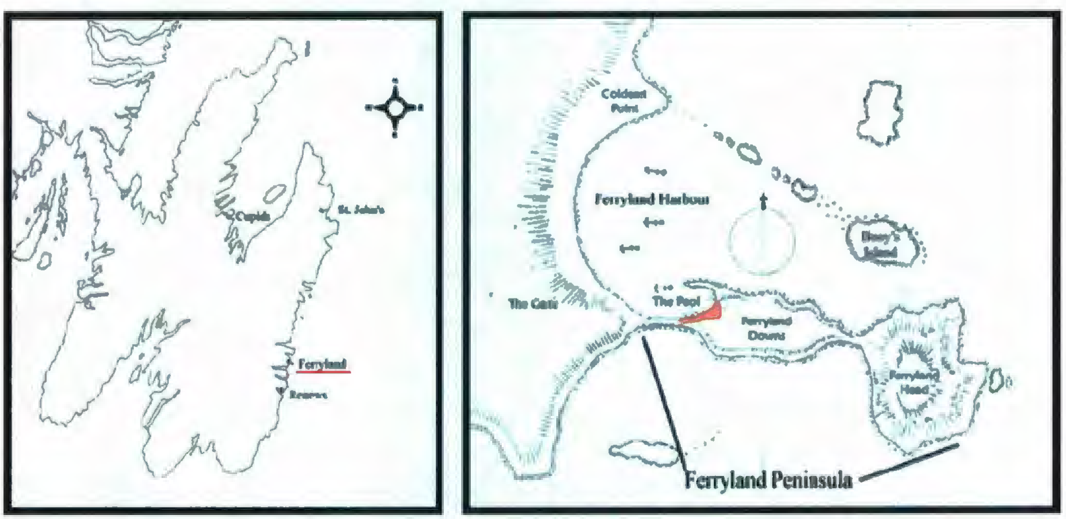

Figure 1a. (left) Location of Ferryland on Newfoundland's Avalon Peninsula. Adapted from Gaulton (2006: 22). Figure 1b. (right) geography of Ferryland, red highlighted area represents the approximate location of the archaeological site and historic community. Adapted from a C.Pettigrew map (Museum and Archives Canada, NMC 000036) first modified by Leskovec (2007: 4).

location emphasizes an easy access to the sea.

The Ferryland Peninsula is joined to the mainland by a narrow isthmus of low altitude with cobble beaches flanking its northern and southern shores. This narrow link to the mainland meant that the peninsula and the community could easily be protected from wild animals, as was noted by Powell (1622 in Pope 1993). The original settlement is located almost immediately east of the isthmus on the shores of the Ferryland Pool. Directly to the southeast is a grassy hill, known as the "Ferryland Downs", which rises above the community, further sheltering it from winds originating from that direction. At the very tip of the Ferryland Peninsula is an expanding piece of land known as "Ferryland Head". A series of islands are interspersed across the entrance of Ferryland Harbour from Ferryland Head to a flattened outstretch of mainland known as "Coldeast Point", approximately one kilometre north of The Pool. The presence of these small islands and rocks restricted ship access to the harbour through a narrow passageway between Buoy's Island and Ferryland Head, thus making the community more easily defensible against outsider attacks. A steep, elevated hill known as "The Gaze", located on the mainland to the west of the peninsula, provides a great lookout point to see over the community.

2.2 Geology and Geological History

Geologically speaking, the island of Newfoundland is an almost complete cross-section of the Appalachian Mountain System which stretches from Alabama up to the edge of the continental shelf which extends approximately 250 kilometres northeast of St. John's (King 1989). The vast expanses of exposed rock, characteristic of the Avalon Peninsula, represents some of the oldest rock formations that make up this mountain system (Hodych, et al. 1989;

King 1989). The underlying rock formation over most of the Avalon Zone dates to the late Precambrian era (approximately 530 million years ago) and represents a deep water marine deposit of volcanic and sedimentary rocks (Hodych, et al. 1989: 5). Overlying this formation in most areas of the Avalon is a Cambrian era deposit (530 - 420 million years ago) of siltstone and sandstone (Ibid., 5).

Newfoundland was glaciated several times during the two million years of the Pleistocene Epoch, but only the last glacial event provided us with the landscape that we see on the island today. The Avalon Peninsula was covered by its own ice cap, whose latest glaciation date is believed to be about 10,100 years ago, where ice melted in a manner that left the most elevated areas exposed first (Rogerson 1989: 124). The coasts of the island may have first been ice-free sometime between 12,500 and 11,000 years ago (Ibid., 130). It was the last episode of glaciation that eroded and destroyed any unconsolidated sediments and landforms deposited by previous glacial events. (Hodych, et al. 1989: 8). The moving ice caps scoured the island's bedrock creating the soil that we see on it today (Ibid., 8).

The rocks exposed in the Ferryland area are those of the Conception, Signal Hill and St. John's groups (King 1990). These are deep marine sedimentary rocks –mostly siltstone, sandstone and shale. Directly below the archaeological site at Ferryland lies the Renews Head formation (Mathias 1998: 25), which is part of the St. John's group and contains "thin beds of rusty-brown weathering sandstone with dark shale laminae" as well as shale interspersed with channelized sandstone (King 1989: 27). The till material that makes up the soil composition for the Ferryland Downs likely originates from the same material as the local bedrock but came from now underwater deposits from as far away as 10 kilometres east of the site (King in

Mathias 1998: 25). During the construction of the historical community at Ferryland, residents are believed to have used till material from the Ferryland Downs to alter their landscape as needed (Tuck 1993: 300).

Not surprisingly, the soils found on the Avalon Peninsula today are closely related to the bedrocks from which they derive– slate, siltstone, sandstone, shale, limestone, conglomerate, and granitic and volcanic rocks (Heringa 1981: 6). The majority of the deposits are glaciofluvial in nature although some past and extent streams have made their own contributions in the form of alluvial sediment deposits. Generally, soils of the Avalon are wet and range from acidic to extremely acidic, rich in minerals and low in organic content, they mostly belong to the Humo-Ferric and Ferro-Humic Podzol groups with some Humic Podzols (Ibid., 6). These types of soils are not naturally fertile, due to high levels of mineral leaching, but can be fairly productive if properly fertilized (Brady and Weil 2002).

The soil from Area F, where the faunal deposits for this study originate, are described as being mainly composed of clay or sandy clay with some angular rocks, a material very similar in composition to the soil from the Ferryland Downs. Limestone plaster was used to line the interior walls of the Mansion House and limestone mortar was used to construct the walls of some of its auxiliary structures. When the building collapsed, the alkaline properties of the crushed limestone are thought to have rendered the soil more basic and thus helped in providing better preservation conditions for organic materials. When compared to what is normally found at the site, a larger than expected number of organic materials, especially animal bones, seemed to have been recovered from deposits within and around the Mansion House (Gaulton 2009, personal communication).

2.3 Climate

Newfoundland's climate is largely influenced by its proximity to the sea and the ocean currents that move past it (Heringa 1981:9). That explains why the Avalon Peninsula, an area classified as a sub-arctic or boreal climate region (Catto 1994: 1786), doesn't share all of the weather patterns typical of sub-arctic ecosystems. The yearly weather cycle of the Avalon is characterized by short, cool and wet summers, short and wet autumns, somewhat mild and wet winters and long springs (Ibid., 1786). The daily mean temperature in January is approximately -5° Celsius and the average temperature in July is 15° Celsius. The region receives approximately 1400 – 1500 mm of annual precipitation, 15 to 25 percent of which falls as snow. The snow is normally present for 140 days of the year in the wooded areas of the interior but it disappears rapidly in the open coastal areas (Ibid., 1786). Strong, fluctuating winds and heavy fogs are no strangers to this part of the world (Ibid., 1786-1787). The Labrador Current, which originates in the Arctic Ocean in the waters between Baffin Island and Greenland, brings cold waters south along the Labrador and Newfoundland coasts as it flows south and south-eastward towards the Nova Scotia coast and out to the Grand Banks. During the spring and early summer, ice flows and icebergs can be found in the waters off Ferryland. These keep the waters around the island to near freezing temperatures, in effect cooling down the air temperatures and delaying the arrival of hot summer weather. However, the Labrador Current is also the reason the Avalon Peninsula doesn't have the same dry and bitterly cold winters as those found in other sub-arctic regions of North America (Heringa 1981: 9).

Newfoundland weather was always subject to the ocean currents that surround it and this was especially evident from the mid thirteenth to the mid nineteenth century when the world witnessed generally cooler climates as a result of glacial ice advances. This cooling period is known as the "Little Ice Age" and culminated between the mid sixteenth and mid nineteenth century (Grove 1988: 1). At the time when Europeans were first settling on the island, the Labrador Current originated in waters that were impregnated with substantially greater amounts of sea ice from the Greenland and Baffin Island glaciers. These dates are confirmed by other studies (Grumet 1997; Grumet, et al. 2001). Woollett et al. (2000) suggest particularly extreme winter conditions for the period between 1600/1650 and 1750.

Pope (2004: 33-34) notes that the cold weather experienced by European settlers in the seventeenth century, from Newfoundland to New England, is well documented in the historical records. These suggest a period of cold weather during the first half of the century followed by a brief period of relatively warmer weather beginning around 1650. Colder temperatures became the norm again sometime in the 1670s and harsh winter weather was not uncommon for the final two decades of the seventeenth century (Ibid., 34). This variability in the weather throughout the century conforms to the sea-ice models developed by Grumet (1997). Hodgetts (2006: 127) notes that despite Newfoundland and England being at about the same latitude, England was not affected by the Labrador Current but rather received the warm waters of the Gulf Stream thus giving it a milder climate. Much like it is today, seventeenth-century English weather was cool and wet during winter months with significantly less snowfall thanks to the moderating effects of the Gulf Stream (Drury 1973: 17-18). England knows no dry season and rainfall is distributed somewhat evenly throughout the year (Ibid., 27). In south-western England, the length of time between frost seasons could last for periods of up to nine months resulting in quite a lengthy growing season (Ibid., 19-20). Therefore living in Newfoundland during the Little Ice Age could, at times, have come as a shock to the English, especially when trying to grow agricultural crops and tend to livestock. Longer, snow covered winters meant livestock needed more winter fodder. Shorter summers meant less time was given to grow crops and thus provide enough winter fodder to sustain large herds (Hodgetts 2006: 127).

Documents originating from Ferryland in the early 1620s do not reflect the cold and harsh weather expected in Newfoundland in the first half of the seventeenth century. In letters written in the summer of 1622, after spending their first full year in Newfoundland, Captain Edward Wynne and Nicholas Hoskins describe their rather pleasant experience on the Avalon:

> *[...] winter [is] short and tolerable, continuing only in January, February and part of March; the day in winter longer than in England; the nights both silent and comfortable, producing nothing that can be said either horrid or hideous. Neither was it so cold here the last winter as in England the year before. I remember but three several days of hard weather indeed, and they not extreme neither, for I have known greater frosts, and far greater snows in our own country.*
> –Captain Edward Wynne, 17 August, 1622. In Pope (1993).

> *The Climate differs but little from England, and I my self felt less cold here this winter than I did in England the winter before, by much.*
> –Nicholas Hoskins, 18 August, 1622. In Pope (1993).

Gaulton and Miller (2009) suggest that these earlier weather accounts, like most early documents pertaining to the colonization of Newfoundland, tend to exaggerate some of the qualities of the island in order to promote further colonization and the flow of sponsorship money. It is equally possible that the first few winters in Ferryland were milder than usual as Wynne later reported in 1630/1631 that his first winters in Newfoundland were relatively mild (Ibid., 118). However, Wynne admits to the unpleasant winter conditions on the island a few years after departing Ferryland and losing association with the colony saying that the island was *"a pleasant place in Sommer; but bleake in winter"* (Wynne 1630/1631, in Gaulton and Miller 2009: 118). Mannion (2000: 4-5) notes that a few other late seventeenth-century accounts of life on the island also suggest that winter weather was not easily tolerated by the English but that those who supported the building of permanent settlements may not have documented their true feelings towards the land and the weather or they stressed the economic benefits of the fishery over the detrimental environmental conditions limiting almost any form of agriculture.

Were it not for these exaggerated accounts on the weather and fertility of the soil, Ferryland may never have been chosen for settlement (Gaulton and Miller 2009: 118). When George Calvert finally arrived in Ferryland in 1628, his account of that winter (1628/1629) to King Charles I, presents a drastically different scenario from that previously reported to him by his settlers.

> *For here, your Majesty may please to understand, that I have found by too dear bought experience, which other men for their private interests always concealed from me, that from the middest of October to the middest of May there is a sad face of winter upon all this land, both sea and land so frozen for the greatest part of the time as they are not penetrable, no plant or vegetable thing appearing out of the earth until it be about the beginning of May, nor fish in the sea, besides the air so intolerable cold as it is hardly to be endured*
> –Sir George Calvert, 19 August, 1629. In Pope (1993).

2.4 Flora

The Ferryland Downs and the isthmus joining the Peninsula to the mainland are essentially devoid of trees except for the occasional small bush or shrub, whereas Ferryland Head currently has many stands of small coniferous trees. The rolling, grassy hills and smooth terrain found around the location where the community was built likely made it a welcomed area for settlers, as they noted that its open country resembled a sort of open meadow with seemingly fertile soils and prime land for pasture (Edward Wynne, 26 August, 1621, in Pope 1993). The mainland contains a patchy Boreal forest interspersed with small open areas. These forests are now partly decimated by fires and anthropogenic activities that began when Europeans first started building fishery stations on the Avalon's shores (Heringa 1981: 16). The devastating impact Europeans had on this forest was noted early in the seventeenth century by Captain Daniel Powell in a letter to George Calvert:

> *The coasts and harbours which we sailed by, are so bold and good, as I assure myself there can be no better in the world; but the woods along the coasts, are so spoiled by the fishermen, that it is great pity to behold them, and without redress, undoubtedly will be the ruin of this good land – for they wastefully bark, fell, and leave more wood behind them to rot, than they use about their stages, although they employ a world of wood upon them and by these, their abuses, do so encumber the woods everywhere near the shore, that it is not possible for any man to go a mile in a long hour.*
> –Daniel Powell, 28 July, 1622. In Pope (1993).

Stands of young coniferous trees are common in this part of the Avalon, many of which are short and stunted, a reflection of the short growing season. The coniferous tree species found includes the balsam fir, the black spruce, the white spruce and the tamarack, each attaining maximum heights of less than 15 metres. The balsam fir is the most common and represents more than 75 percent of trees in the forest. The eastern white pine once had a formidable presence on the Avalon, but disease and logging has extirpated it from the peninsula (Heringa 1981: 16). The few deciduous stands in the area are mostly made up of white and yellow birch. Tremble aspen and small red maple are sporadically found in very small numbers across the peninsula. Groundcover in the forest stands mostly includes bunchberry, bristly club-moss, raspberry, gooseberry, northern twinflower, blueberry, sheep-laurel, dogberry, goldenrod, pin cherry, serviceberry, foxberry or cowberry, Labrador-tea, reindeer moss, ground fir, black crowberry, fireweed, sphagnum mosses, sweet gale and other shrubs and mosses (Ibid., 19).

Approximately 34 percent of the Avalon is covered by heath and barren lands, large open areas of rolling hills where plant growth is hindered by strong winds and unfertile, wet soil. The barrens are believed to be the result of repeated wildfires (Heringa 1981: 19). They begin approximately six to eight kilometres inland from the Ferryland coast. The most common plants found in this area include sheep-laurel, blueberry, fireweed, partridgeberry, goldenrod, black crowberry, bunchberry, Labrador-tea, small cranberry, burnet, ground-fir, common club-moss, meadowsweet and creeping snowberry (Ibid., 19).

In a 1622 letter, Nicholas Hoskins identifies some of the wild plants he found in the forests outside of Ferryland, thus providing us with an idea as to which wild plants the English saw as being edible:

> *The wild fruit and berries are* ***small pears, cherries, nuts, raspberries, strawberries, barberries, dewberries, whortleberries****, with other, all good to eat. Many fair flowers I have seen here, which I cannot name, although I had learned Gerrard's* <u>*Herbal*</u> *by heart. But* ***wild roses*** *are here both red and damask, as fragrant and fair as in England.*
> –Nicholas Hoskins, 18 August, 1622. In Pope (1993).

2.5 Fauna

> *Within land there are plains innumerable, many of them containing many thousand acres, very pleasant to see to, and well furnished with ponds, brooks and rivers, very plentiful of sundry sorts of* ***fish,*** *besides store of* ***deer*** **[caribou]** *and other beasts that yield both food and fur.*
> –Captain Edward Wynne, 17 August, 1622. In Pope (1993).

Ferryland's location between the rich ocean waters fed by the Labrador Current and a mixed boreal forest/barren lands ecosystem presented European settlers with a unique diversity of wild fauna not yet experienced by the English. Table 1 lists some of the most abundant and economically important fish, bird and mammal species that would have been available on the Avalon in the seventeenth century.

In the waters off Ferryland's coast lie the Grand Banks, one of the largest portions of submerged continental shelf in the world, even larger than the island of Newfoundland itself (Farmer 1981). These banks and the cool Labrador Current that flows over it supported some of the richest fishing grounds ever before seen by Europeans. The most important fish species found in these waters was the Atlantic cod (*Gadus morhua*) and the cod fishery was, not surprisingly, Ferryland's primary economic activity (Pope 2004). Other important fish species which could have conceivably been consumed by Europeans either as a result of by-catch or direct fishing includes other members of the cod taxonomic family (Gadidae), such as pollock (*Pollachius virens*) and haddock (*Melanogrammus aeglefinus*). The Atlantic halibut (*Hippoglossus hippoglossus)* is the largest member of the flatfish family and a single one could have made a fine catch capable of feeding many. Anadromous fish such as the Atlantic salmon (*Salmo salar*) and the arctic char (*Salvelinus alpinus*) would have been available in the rivers and lakes of the Avalon especially during the spawning season. English surgeon James Yonge recounts salmon fishing activities at the river mouths during his voyage to the area during the second half of the seventeenth century (Yonge 1663, in Pope 1993).

Birds represent the most diversified class of animals found on the island and the large sea bird populations attest to the rich marine life supported by its coasts. These marine species include various types of gulls, sea ducks and murres, all of which can be commonly found either flying above the Ferryland Peninsula, perched on its shores or bobbing on the surface of

Table 1: Fish, birds and mammals commonly found in Newfoundland (Banfield 1974; Godfrey 1966; Scott and Scott 1988)

Fish	Birds	Mammals
White shark (*Carcharodon carcharias*)	Common loon (*Gavia immer*)	Little brown bat (*Myotis lucifugus*)
Basking shark (*Cetorhinus maximus*)	Red-throated loon (*Gavia stellata*)	Arctic hare (*Lepus articus*)
Porbeagle (*Lamna nasus*)	Pied-billed grebe (*Podilymbus podiceps*)	American beaver (*Castor canadensis*)
Blue shark (*Prionace glauca*)	Greater shearwater (*Puffinus gravis*)	Muskrat (*Ondotra zibethicus*)
Black dogfish (*Centroscyllium fabricii*)	Leach`s petrel (*Oceanodromo leucorhoa*)	Meadow vole (*Microtus pennsylvanicus*)
Spiny dogfish (*Squolus acanthias*)	Gannet (*Morus bassanus*)	Roof rat (*Rattus rattus*)
Winter skate (*Raja ocellata*)	Great cormorant (*Phalacrocorax carbo*)	Brown rat (*Rattus norvegicus*)
Thorny skate (*Raja radiata*)	Double-crested cormorant (*Phalacrorax auritus*)	House mouse (*Mus musculus*)
American eel (*Anguilla rostrata*)	American bittern (*Botaurus lentiginosus*)	White-beaked dolphin (*Lagenarhynchus albirostris*)
American shad (*Alosa sapidissima*)	Canada goose (*Branta canadensis*)	Atlantic white-sided dolphin (*Lagenarhynchus acutus*)
Atlantic herring (*Clupea harengus*)	Black duck (*Anas rubripes*)	Killer whale (*Orcinus orca*)
Atlantic salmon (*Salmo salar*)	Pintail (*Anas acuta*)	Harbour porpoise (*Phocoena phacoena*)
Arctic char (*Salvelinus alpinus*)	Green-winged teal (*Anas carolinensis*)	Fin whale (*Balaenoptera physalus*)
Brook trout (*Salvelinus fontinalis*)	Blue-winged teal (*Anas discors*)	Minke whale (*Balaenoptera acutarostrata*)
Capelin (*mallotus villosus*)	Wood duck (*Aix sponsa*)	Humpback whale (*megaptera novaeangliae*)
Rainbow smelt (*Osmerus mordax*)	Ring-necked duck (*Aythya collaris*)	Wolf (*Canis lupus*)
Atlantic argentine (*Argentina silus*)	Common Goldeneye (*Bucephala clangula*)	Red fox (*Vulpes vulpes*)
Arctic cod (*Boreogadus saida*)	Long-tailed duck (*Clangula hyemalis*)	American black bear (*Ursus americanus*)
Cusk (*Brosme brosme*)	Harlequin duck (*Histrionicus histrionicus*)	American marten (*Martes americana*)
Fourbeard rockling (*Enchelyopus cimbrius*)	Common eider (*Somateria mollissima*)	Ermine (*Mustela erminea*)
Atlantic cod (*Gadus morhua*)	King eider (*Somateria spectabilis*)	River otter (*Lantra canadensis*)
Greenland cod (*Gadus ogac*)	White-winged scoter (*melanitta deglandi*)	Lynx (*Lynx lynx*)
Haddock (*Melanogrammus aeglefinus*)	Surf scoter (*Melanitta perspicillata*)	Grey seal (*Halichoerus grypus*)
Silver hake (*Merluccius bilinearis*)	Common scoter (*Oidemia nigra*)	Harbour seal (*Phoca vitulina*)
Atlantic tomcod (*Microgadus tomcod*)	Common merganser (*Mergus merganser*)	Harp seal (*Phoca groenlandica*)
Pollock (*pollachius virens*)	Red-breasted merganser (*Mergus serrator*)	Hooded seal (*Crystophora cristata*)
White hake (*Urophycis tenuis*)	Goshawk (*Accipiter gentilis*)	Caribou (*Rangifer tarandus*)
Ocean pout (*Macrozoarces americanus*)	Sharp-shinned hawk (*Accipiter striatus*)	
Atlantic wolffish (*Anarhichas lupus*)	Rough-legged hawk (*Buteo lagopus*)	
Atlantic mackerel (*Scomber scombrus*)	Golden eagle (*Aquila chrysaëtos*)	
Bluefin tuna (*Thunnus thynnus*)	Bald eagle (*Haliaeetus leucocephalus*)	
Swordfish (*Xiphias gladius*)	Osprey (*Pandion haliaetus*)	
Redfishes (*Sebastes* sp.)	Pigeon hawk (*Falco columbarius*)	
Windowpane (*Scophthalmus aquosus*)	Willow ptarmigan (*Lagopus lagopus*)	
Witch Flounder (*Glyptocephalus cynoglossus*)	Rock ptarmigan (*Lagopus mutus*)	
American Plaice (*Hippoglossoides platessoides*)	Semipalmated plover (*Charadrius semipalmatus*)	
Atlantic halibut (*Hippoglossus hippoglossus*)	American golden plover (*Pluvialis dominica*)	
Yellowtail flounder (*Limanda ferruginea*)	European woodcock (*Scolopax rusticola*)	
Arctic flounder (*Pleuronectes glacialis*)	Spotted sandpiper (*actitis macularia*)	
Winter flounder (*Pseudopleuronectes americanus*)	Greater yellowlegs (*Totanus melanoleucus*)	
Greenland halibut (*Reinhardtius hppoglossoides*)	Least sandpiper (*Erolia minutilla*)	
	Pomarine jaeger (*Stercorarius pomarinus*)	
	Glaucous gull (*Larus hyperboreus*)	
	Great black-backed gull (*Larus marinus*)	
	Herring gull (*Larus argentatus*)	
	Ring-billed gull (*Larus delawarensis*)	
	Black-legged kittiwake (*Rissa tridactyla*)	
	Common tern (*Sterna hirundo*)	
	Arctic tern (*Sterna paradisaea*)	
	Great auk (*Pinguinnus impennis*)	
	Razorbill (*Alca torda*)	
	Common murre (*Uria aalge*)	
	Thick-billed murre (*Uria lomvia*)	
	Black guillemot (*Cepphus grylle*)	
	Common puffin (*Fratercula arctica*)	
	Great horned owl (*Bubo virginianus*)	
	Snowy owl (*Bubo scandiaca*)	
	Hawk owl (*Surnia ulula*)	
	Short-eared owl (*Asio flammeus*)	
	Grey Jay (*Perisoreus canadensis*)	
	Blue jay (*Cyanocitta cristata*)	
	Common raven (*Corvus corax*)	
	Common crow (*Corvus brachyrhynchos*)	

the surrounding waters. Other duck varieties, owls and wildfowl such as the willow ptarmigan (*Lagopus lagopus*) are commonly found in the island's interior whereas large raptors such as bald eagles (*Haliaeetus leucocephalus*) can be found patrolling the ground from both the coastal and interior skies (Godfrey 1966). The extinct bird species of great auk (*Pinguinnus impennis*), a large flightless bird reminiscent of a penguin, was once a common sight in Newfoundland waters. The last known breeding colony was at Funk Island, north off the coast of central Newfoundland (Montevecchi and Tuck 1987). It may have been present somewhere in the waters off the Avalon shores as archaeological evidence indicates Europeans in this region also had access to them (Hodgetts 2006; Pope 2009)

Some of the largest seabird colonies in North America are located on various coasts and coastal islands interspersed along the Avalon's shores representing a constant and ready supply of seabirds for any prospective hunter. The nearest extant sea bird colony to Ferryland are the Witless Bay islands. This is a group of three islands; named Gull, Great and Green Island, located not too far off the coast, some 26 kilometres north from Ferryland. The largest is Gull Island which supports a limited forest of fir and spruce trees and is surrounded by steep cliffs making it difficult to access by humans (Montevecchi and Tuck 1987: 169). Species currently found on this island and in the waters surrounding it include the northern fulmars (*Fulmaris glacialis*), Leach's storm-petrels (*Oceanodroma leucorhoa*), herring gulls (*Larus argentatus*), great black-backed gulls (*Larus marinus*), black-legged kittiwakes (*Rissa tridactyla*), razorbills (*Alca torda*), common murres (*Uria algee*), thick-billed murres (*Uria lomvia*), black guillemots (*Cepphus grylle*) and the common puffin (*Fratercula arctica*) among others (Ibid., 171). Bird colonies are believed to have been an important resource attraction when choosing a location for setting up temporary fishing stations (Pope 2009) and may have been an important resource for Ferryland residents as well.

The historical records provide evidence for bird hunting by Europeans and descriptions of some of the procedures used to catch them. Captain Wynne once requested in a 1622 letter to George Calvert to send him "two fowling pieces of six foot in the barrel and one of seven foot with a mould to cast shot of several sizes for fowling" (Wynne 1622, in Pope 1993). James Yonge provides an account of how the local residents go about catching a "noddy" during the second half of the seventeenth century. A noddy is described as being something less than a gull with a blunt head and shorter bill. He continues:

> *They have a pretty way of catching them thus: they take a round piece of cork as big as a trencher, and fasten a piece of lead to it, and with a fishing line let it swim off; to the edges of this cork are fastened divers small hooks with some bait, as pork flesh, &c.; This the noddies swallow and are drawn in. They are good meat, and eat but a little fishy.*
> –James Yonge, 1663. In Poynter (1963: 54-55)

A total of 12 terrestrial mammals are native to the island of Newfoundland. The largest of these include the caribou (*Rangifer tarandus*), the black bear (*Ursus americanus*) and the wolf (*Canis lupus*). Important fur bearing species include the beaver (*Castor canadensis*) and the American marten (*Martes americana*). All of these species are more likely to be found in the forests and barren lands of the interior rather than up on the coast and the Ferryland Peninsula. The black rat (*Rattus rattus*) and brown rat (*Rattus norvegicus*), along with the house mouse (*Mus musculus*), were introduced to Newfoundland from Europe, but are included in the wild species list presented in Table 1 because these commensal creatures were not cared for or bred by humans and were essentially wild on the site. In a letter written in summer of 1622, the second summer of year-round European settlement in Ferryland, Edward Wynne mentions the need for "rats-bane", which Pope (1993) believes might be rat poison and would suggest a rat problem developing as early as the second year at Ferryland.

Four different types of seal can be found in the waters and ice flows off Ferryland. Grey seals and harbour seals come onto the shores whereas harp seals and hooded seals arrive every spring with the ice flows from northern waters as part of their yearly migration (Banfield 1974). Some species of dolphins and whales are found seasonally in the waters off the coast while others are found year round (Ibid.).

One of the best accounts of wildlife in Newfoundland and what use an Englishman could make of it comes from Captain Nicholas Hoskins in a letter he wrote to W. P. (?) in the late summer of 1622.

> *For in the Whitson holidays I (taking with me Master Stoning) did coast some ten miles into the country, westward from our plantation, to make some discovery of the country and to kill a* ***deer*** **[caribou]**. *... In the night, the* ***wolves****, being near, did something affright us with their howlings but did not hurt us, for we had* ***dogs****, fire and sword to welcome them. As for the* ***bears****, although there be many, they bear us no ill will, I think, for I have eaten my part of two or three, and taken no hurt by them.* ***Foxes*** *here are many and as subtle as a fox, yet have we cozened many of them of their rich coats, which our worthy Governor keeps carefully, as also of* ***cattagenas***[1] **[American marten]** *and otters, whose coverings we preserve as fitting presents for greater persons. The fowls and birds of the land are* ***partridges, kerlews, fillidayes, blackbirds, bullfinches, larks, sparrows****, and such like. Those of the sea are* ***goose, ducks*** *of four sorts,* ***capderace, teal, snipes, penguins*** **[great auks]**, ***murres, hounds*** **[long-tailed ducks]**, ***sanderlings, redshanks*** *and others – all very fat, sweet and wholesome. The fowls of prey are* ***tercels*** **[male hawks]**, ***goshawks, falcons, laners*** **[falcons]**, ***sparhawks*** **[sparrowhawks]**, ***gripes, ospreys, owls*** *great and small,* ***ravens, gulls, pitterils*** *and some others; and of most of these sorts I have killed many. As for the plenthy of* ***codfish****, it is well known unto you.* ***Salmons, eels, mackerel, herrings, lance, caplin, dogfish, halibuts, flukes, lobsters,***

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[1] Pope (1993) translates the word "cattagenas" as a possible reference to lynx. Maunder (2003) cites that the word "cattagenas" is a variant of "catnaghenes" from the standard Gaelic "catcraiin" which literally translates to "tree cat" a term often used for martens. Therefore, the reference is most likely to be to an American marten (*Martes americana*). Another reference to cattagenas in Newfoundland appears in John Mason's 1620 discussion of the island (Mason 1620, in Cell 1982).

***crabs** and **mussels**, all and more than all these are here in great plenty, very good and sweet meat.*
– Nicholas Hoskins, 18 August, 1622. In Pope (1993).

Chapter 3: Historical Context and Theoretical Approach

Archaeologists record the artefacts and the contexts in which they were recovered to gain information about the human behaviour responsible for the deposition of these materials; these behaviours cannot be directly observed and are now only visible in the inert objects that survived to this point in time. The proper identification of such behaviour can be used to ask bigger questions regarding the invisible cultural constructs responsible for having created them, such as the presence of a belief system or that of higher social organization. Such inferences are not made in a haphazard way; they are guided through by the cumulative work of other researchers resulting in the development of a theoretical approach for answering specific research questions. Armed with both a deep understanding of the historical, social and environmental contexts for the time period and culture under study, along with an appropriate theoretical paradigm, archaeologists are better equipped for investigating the past. This research project asks questions about past social structure and the various behaviours it produced relating to the consumption of food. This chapter explores the nature of seventeenth-century social structure and the theoretical approach used in the investigation of differential consumption habits of English society at the time. This is presented alongside pertinent historical information concerning Ferryland and the known dietary habits of the English in the seventeenth century.

3.1 Historical Background

The history of events occurring at Ferryland is known from the considerable amount of documentation related to the community and from the extensive archaeological excavations and research held at the site since 1992. The majority of the historical documents pertain to the early years of settlement in the 1620s. Peter Pope (1993) has compiled most of the historical records pertaining to Ferryland and Gillian Cell (1982) has included many of the earlier documents in her book dealing with the European colonization of Newfoundland. The following is a brief history of the site, based on the current understanding of both the historical and archaeological records.

Evidence suggests that a Native Beothuk population frequented the coast of Ferryland prior to the arrival of Europeans, leaving behind remains of hearths and small stone tools (Gaulton and Tuck 2003: 187-188). By 1510, European fishing crews were regularly involved in the summer migratory fishery in the waters off Newfoundland. At that time, Ferryland's sheltered inner harbour would have undoubtedly been an alluring feature to some of the Basques, Portuguese, French and English fishing vessels frequenting the Grand Banks (Pope 2004: 39). The name of the site itself likely derives from the Portuguese *farelhão*, meaning a steep rock or cliff (Seary 1971: 27-29). Ceramic vessels recovered from an early 1550 context in Ferryland are suggestive of a Breton presence on the site (Pope and Batt 2008) and fragments of North Devon pottery were recovered from an ancient sand beach, likely an area used for the construction of temporary platforms on which to dry codfish, suggestive of an early English presence (Gaulton and Tuck 2003: 188). As the competition for access to the rich fishing grounds increased in the seventeenth century, permanent European settlements began to appear on the Avalon's coast. Ferryland represents one of the first permanent settlements on the English Shore, the area along the east coast of Newfoundland stretching from Bonavista Bay in the north to Trespassey in the south (Pope 2004).

3.1.1 George Calvert

In 1620, Sir George Calvert, then the Secretary of State for King James I and later the first Lord Baltimore (Fraser 1966: 162), purchased the property of Ferryland from a Welshman by the name of William Vaughan. Prior to signing part of his grant to Calvert, Vaughan had unsuccessfully tried to install a permanent settlement on the south east coast of the Avalon (Gaulton and Tuck 2003: 189). The property that Calvert purchased was later extended to expand almost the entire length of the English Shore, from Aquaforte, north to the borders of St. John's (Pope 1986: 15). Ferryland was George Calvert's first attempt at setting up a colony in the New World where he hoped he could profit from its reportedly endless supply of natural resources (Krugler 2004). Calvert was no stranger to business and enterprise. He was already an investor in both the Virginia and East India companies (Cell 1982: 92). In Ireland, he was the proprietor of over 2,300 acres of arable and pasture land including a few castles and villages in the counties of Longford and Wexford. He also owned over 1,600 acres of forests in these regions (Krugler 2004: 86-87; Mannion 2004). Nonetheless, Ferryland was a venture he was passionate about and one in which he would invest a large sum of his own money (Pope 1986: 15).

In August of 1621, a dozen of Calvert's settlers, under the direction of Captain Edward Wynne, arrived in Ferryland to begin construction on their sponsor's new community (Gaulton and Tuck 2003: 189). Captain Wynne describes the location in which he chose to build as "the fittest, the warmest, and most commodious of all about the harbour" (Edward Wynne, 26 August 1621, in Pope 1993). He and his men immediately went to work on various construction projects with a focus on housing and infrastructure for the community. Some of the first structures built on the site include: a large kitchen measuring 12 by 18ft, a parlour and a henhouse all built before the settlers' first Christmas in Ferryland. A palisade, two or more tenements, a forge and a saltworks were all completed by the summer of 1622 and ground was broken for the construction of a brew house (Gaulton and Tuck 2003: 190). A priority upon their arrival to Ferryland was the construction of a house that would first serve as shelter for Wynne and his men throughout the upcoming winter.

This house was completed sometime before November first, 1621. It was a one and a half story timber-framed structure whose upper floor was divided into four rooms. The specifics of its construction are described in a letter written to George Calvert in the summer of 1622:

> *The which being 44. foot of length, and 15. foot of breadth, containing a hall 18. foot long, an entry of 6. foot, and a cellar of 20. foot in length, and of the height, between the ground floore and that ouer head about 8. foote, being deuided aboue, that thorowout into foure chambers, and foure foot high to the roofe or a half storie.*
> –Edward Wynne, July 1622. In Cell (1982: 196).

Captain Daniel Powell also mentions this residence in a letter written to George Calvert that same summer:

> *His* [Captain Wynne's] *house is strong and well contrived, standeth very warm, at the foot of an easy ascending hill, on the south-east, and defended with a hill, standing on the further side of the haven on the north-west.*
> –Daniel Powell, 28 July 1622. In Pope (1993).

Later historical documents make reference to Calvert's "Mansion House" as the large building in which he and his family resided upon their arrival at Ferryland. The house described above was initially thought by historians and archaeologists as Calvert's Mansion House because it was the largest one described in the early documents relating to the colony. Archaeology has since revealed that this is not the case. It appears that a larger, two-story stone structure with a slate roof was constructed sometime between 1623 and 1625, a period for which no documents related to the site exist (Gaulton 2008, personal communication). The discovery of this structure suggests there would be no reason for George Calvert to have inhabited a smaller timber-framed building when a larger, warmer, solid stone house was available. The Mansion House's structural and archaeological details are further discussed in Chapter 4.

Already present at the site in the summer of 1622 was a surgeon, a husbandman, two blacksmiths, a stone-layer, a quarryman, three carpenters, a tailor, three boat masters, a fisherman and a cooper. In 1622 Wynne requested Calvert send him another six masons, four carpenters, two or three quarrymen, one or two slaters and "a couple of strong maids" (Cell 1982: 203). Perhaps this need for such a great number of skilled labourers, hints at Wynne's plans to build a large and superior structure or structures, including the Mansion House (Barry Gaulton 2009, personal communication).

George Calvert visited the colony in the summer of 1627 and must have been impressed with what he saw for he returned there the following summer bringing with him forty other settlers and moved into the Mansion House along with his family (Gaulton and Tuck 2003: 191). Unfortunately, as was previously discussed in Chapter 2, the winter of 1628/1629 was one of the coldest and most severe winters yet to be experienced by the European colonists. The following is an excerpt from a letter written by George Calvert to King Charles I, describing some of the ordeals suffered by the community.

> [...] *by means whereof and much of my salt meat, my house* [the Mansion House] *hath been an hospital all this winter. Of 100 persons 50 sick at a time, myself being one and nine or ten of them dyed.*
> – George Calvert, 19 August, 1629. In Pope (1993).

Aside from the terrible weather, the sickened community and the loss of his home to function as a hospital, Calvert was further distressed by numerous threats from French pirates.

After experiencing his first Newfoundland winter, George Calvert decided that, despite his large monetary investment into the colony, he did not want to live here anymore and asked the King for a second chance at establishing an English colony in a warmer climate. Calvert and his family left the island never to return again. Captain William Hill was eventually appointed as Lord Baltimore's representative in Ferryland in 1632, and he managed the affairs of the community for the Calverts from the Mansion House. Unfortunately for those who stayed in Ferryland, Calvert's financial involvement dropped dramatically and eventually stopped altogether (Gaulton and Tuck 2003: 211). George Calvert died in England in 1632 but his family went on to establish the colony of Maryland on the shores of the Chesapeake (Ibid.).

Although Calvert initially invested a considerable amount of money into Ferryland, the colony itself was not very profitable and made little in returns (Pope 2004: 143). The primary engine of its economy was the cod fishery which suffered a period of decline in the late 1620s and early 1630s. Pope (2004: 124) notes that although bad weather conditions were cited by Calvert as the reason for his departure, the declining fishery and the uncertainty of the economic viability of the colony undoubtedly affected his decision.

3.1.2 David Kirke

In November of 1637, the "Grant of Newfoundland" was signed over by Charles I to several court favourites including the Marquis of Hamilton, the Earls of Pembroke and Holland, and Sir David Kirke. This grant provided its holders the opportunity to impose a five percent tax on the fish caught or carried by foreign vessels (i.e., the French and the Dutch) in the waters off the Avalon coast. The business aspect of this grant was placed in the charge of the syndicate of Kirke, Barkeley and Company (Pope 2004: 101).

As head of this syndicate, Sir David Kirke took it upon himself to manage the affairs of Ferryland and subsequently became the Governor of Newfoundland. He moved there with his family and 100 other settlers in 1638. Along with this change in management came a shift in the economic organization of Ferryland; from Calvert's sponsored colonial venture to a more individualistic mercantile one (Pope 2004). David Kirke was a shrewd businessman and wine merchant and sought to make a profit from the colony. He invested heavily in boats, labourers, victuals, ordnance, commercial structures and ships needed to enforce the collection of taxes. David Kirke quickly settled into the role of Ferryland's principal merchant using his existing contacts to further profit in the fish and wine trade. He created commercial networks linking Dartmouth, Ferryland, Piscataqua and Boston among others, in the trade of fish and wine (Ibid., 412). Kirke also began imposing rents for fishing rooms and charging licensing fees for taverns. He would later be accused of monopolizing certain commodities like salt and alcohol then charging inflated prices for these items (Ibid., 140). In the end, Kirke managed to turn what was looking more and more like a failed colonization attempt into a successful, personal business.

Taking advantage of some of Calvert's investments in the community, especially some of the existing infrastructure helped Kirke start his own ventures at Ferryland. The waterfront area built under the direction of Captain Wynne, allowed for the easy loading and unloading of cargo which could then be stored in the warehouse located next to the harbour, perfect for the commercial activities Kirke had planned for the community (Gaulton and Tuck 2003: 209). The nearby grounds were already cleared for pasture and domestic animals such as cows and goats were being raised on the site (Ibid., 212). Upon his arrival to Ferryland, David Kirke appropriated the Mansion House from Calvert's representative, William Hill, along with *"six or seven* ***horses,*** *3* *chaires, a table board, and an old bedstead*" (Pope 2004: 147). He moved into the building along with his family. The following is an account of his arrival:

> *Whereupon in the year of one thousand six hundred thirty and eight, Sir David Kirke went to Ferryland aforesaid, in Newfoundland, and by force of arms turned the said Captain Hill out of possession of the Lord Baltimore's chief Mansion House there above mentioned (wherein the said Lord Baltimore had at that time divers things of good value) and took possession also of all the said Province and of divers* ***cattle*** *and* ***horses****, belonging to the said Lord Baltimore, upon pretence of the said later patent and upon pretence that he, the said Lord Baltimore, had deserted, forfeited, or surrendered his interest there and received satisfaction for the same, which is altogether untrue, and so hath continued the possession thereof ever since, to the great damage of the said Lord Baltimore, to wit, thirty thousand pound at least, as he can make appear.*
> –Counsel for Cecil Calvert, Second Baron Baltimore, 23 December, 1651. In Pope (1993).

Under David Kirke, Calvert's colony of Avalon would be known as the 'Pool Plantation'. While taking advantage of the pre-existing infrastructure, Kirke did invest a large sum of money himself in a manner somewhat comparable to what Calvert had spent, thus leaving his own mark on the organization of the settlement (Pope 2004). Several of Wynne's original structures were eventually demolished shortly after Kirke's arrival, such as the bake/brew house and the forge (Gaulton and Tuck 2003: 212). Kirke built a new house for himself and his family overtop the location of the bake/brew-house, which incidentally, is immediately next to the Mansion House. Archaeologists refer to this new residence as the Kirke House (Gaulton and Tuck 2003: 213-214; Gaulton 2006). This was a large structure for the time period and its uses were not entirely residential as archaeologists uncovered what might be a tavern located within this building (Gaulton and Tuck 2003: 214-215).

A civil suit was filed against David Kirke in 1651 by Cecil Calvert, George Calvert's son and the second Baron Baltimore. The charge was over the rightful possession of Ferryland and the English Shore and appeared in the courts soon after the English Civil War culminated with the beheading of David Kirke's good friend Charles I. In 1651, David Kirke was recalled to England to answer to the charges. He was imprisoned and eventually died in 1654. Before his death, he wrote a will handing over everything in Newfoundland to his wife and children (Pope 1998: 65). However the Commonwealth seized all of his lands and assets during his imprisonment. John Treworgie, a New England man, was named commissioner of Ferryland by the Commonwealth and was sent there in 1653 to ensure the smooth operation of the fishery. During this time, Lady Sara Kirke and her sons refused to leave the plantation and thus secured their tenure as proprietors and managers of Ferryland after the restoration of the Crown in 1660 and the subsequent departure of John Treworgie (Gaulton and Tuck 2003:209; Pope 1992).

3.1.3 Ferryland after David Kirke

Life in Ferryland was for the most part uneventful until September 4th, 1673, when the community suffered from the attack of four Dutch warships. The town and its forts were plundered but not totally destroyed, and the Kirkes were quick to rebound from the attacks (Pope 1993, 2004). Lady Sara Kirke is believed to have passed away sometime around 1680, when mentions of her disappear from the historic records (Tuck and Gaulton 2004). Her sons are believed to have carried on the family business (Pope 1993).

On September 21st, 1696, nine French warships and over 700 soldiers sailed into Ferryland Harbour and laid siege on the community. The French forces were under the command of De Brouillan, Governor of the French outpost of Plaisance (now Placentia) located on the south west coast of the Avalon Peninsula. Their attack on the community was part of a larger plan to disrupt the English fishery in Newfoundland (Williams 1987). The attack burned and destroyed most of the community including the Mansion House (Pope 1993: 151). The town's inhabitants were either shipped back to Devon in England or they were taken prisoner by the French. Among those taken captive were the three remaining Kirke sons; George, Phillip and David, all of whom eventually passed away that winter. The community was resettled soon afterwards with David (the son) Kirke's wife, Mary, claiming possession of the Pool Plantation. Archaeological evidence suggests that those who resettled the community in 1697 did so in a slightly different location as there is comparatively less evidence for an eighteenth-century occupation over lands formerly occupied during the Calvert and Kirke period (Gaulton 2009, personal communication).

3.2 Life in Ferryland

From the moment Calvert first established the community up to well into the twentieth century, the primary activity that drove the Ferryland economy was the cod fishery. Consequently, the daily, weekly, and annual activity cycles were defined by the seasonal nature of the fishery and the work involved in catching and processing cod. Atlantic cod was found in the waters off Ferryland's shore mostly in the late spring, summer and early fall. For such a small and isolated community to be economically focused on a resource that is only exploitable during four or five months of the year suggests that they must have developed certain strategies to manage a functional and economically viable community (Pope 2004: 40). Population management represents one way the English dealt with this situation in the seventeenth century. For example, in 1640, the overwintering European population of the island of Newfoundland did not exceed a couple hundred souls. However, its summer population rivalled those of the New England and Virginia settlements with numbers ranging between five and six thousand (Ibid., 200). The summer population was not only made up of planters, their families and servants but also included an influx of migratory fisherman who worked on the fishing ships and by-boats (Pope 1992: 207). Aside from the seasonal movement of cod, Ferryland's population was affected by both the yearly state of the cod stocks and the political situation in England (Hodgetts 2006: 126).

In order to maximize profits, it was essential for any Ferryland planter (resident boat-owner) to employ as many people as possible during the summer months in order to catch and process the greatest number of cod. Once the fishing season was over, the logistics involved in feeding and lodging such a large workforce would undoubtedly represent a significant burden to both the employer and the community. Therefore the majority of those employed for the summer fishery returned to England at the end of the season, resulting in a drastic decline in Ferryland's population over the winter months.

Despite the important role the fishery played in the development of Ferryland, the primary task for Captain Wynne and his men during the early years of settlement was not so much the export of dry cod, but rather a focus on the construction of the community's infrastructure. Only 32 settlers were present in 1622 and this number includes only one recorded fisherman and three boat keepers. The remainder of the settlers were tradesmen mostly involved with construction projects (Cell 1982: 203). By 1625, approximately 100 people were living in Ferryland (Pope 2004: 56). The population was of similar size during that cold winter of 1628/1629 (Ibid., 127). By 1630, after Calvert's departure, only 30-35 of those 100 residents are believed to have remained in Ferryland (Ibid., 56).

David Kirke arrived in 1638 along with his family and 100 other settlers, 30 of which are believed to be his servants (Pope 2004: 59). The trade network promoted by Kirke was based on the production of codfish and therefore the fishery played an increasingly important role during Kirke's tenure. Unfortunately, no historical records indicative of the Ferryland population have been found for this time period. Censuses taken between 1675 and 1677 suggest Ferryland had summer populations of about 8-10 planters, 10-20 wives and children and 97-112 servants (Hodgetts 2006: 126; Pope 1993). It is thought that an overwintering population for Ferryland in the 1670s was between a minimum of 20-30 individuals if only planters and their families remained, and a maximum of 125 to 150 people if all of their servants remained (Hodgetts 2006: 126). The summer population of Ferryland at this time would have likely doubled those numbers with a population of over 200 inhabitants (Ibid., 127).

It should be noted that overwintering population numbers are more difficult to estimate since it is not always clear how many of a planter's servants would have stayed. Pope (2004: 64) believes that approximately 65 percent of the servant population would overwinter, based on the documents for 1680-1681 indicating that 1,130 of 1,718 servants overwintered that year on the entire English Shore. It should be noted that men outnumbered women in seventeenth-century Newfoundland because fishing servants were almost always male (Ibid., 56). In 1677, females made up only 1/8th of planter households and half of these females were children. Females represented 1/6th of the overwintering population since many of the male servants involved in the fishery returned to England at this time (Ibid., 215).

3.3 Seventeenth-Century English Social Structure

English social structure during the seventeenth century was essentially a patriarchal system where the household was the basic building block of society and the father was the head of the household (Johnson 1996: 34). When seen as a whole, English society can generally be described as a ranked system of social classes where the relationships between members of the same social rank and the relations between members of different social rankings were highly regulated by the cultural conceptions of a formal hierarchical system (Ibid., 32). Prescribing social status to an individual in the seventeenth century is not always an easy task as there are many different factors that can define one's place in that system. Factors including family of birth, title, wealth, occupation, land ownership, lifestyle and position of authority, although all somewhat interrelated, represent the major criteria for ascribing status during that time period (Wrightson 1986: 180). Further complicating the matter, a certain amount of social fluidity was also possible, allowing an individual to move up or down the social ladder through various means such as: marriage into the upper class, the loss of one's fortune or property, or the rise to a position of power within a community or government (Johnson 1996: 35).

Johnson (1996: 32) likens the English hierarchical system to "A Great Chain of Being stretching from the Heaven through to the Natural World". In theory, the monarch was god's representative on earth and, obviously, the highest social status achievable in the English social system. Further down the social ladder, the closer one was to the monarchy, and theoretically closer to god, then the more important was their social status. After royalty comes the aristocracy. This small group of people represent titled landowners who often held positions of political leadership. They were typically the owners of large estates and castles that were present throughout the country and often served as centers of hospitality for members of the local community (Ibid., 32). After the aristocracy came the gentry, a group of wealthy landowners without titles. Forming only two percent of the population yet owning more than 50 percent of the available land (Ibid., 32), the gentry garnered considerable influence and power at the local level and were regarded as an important source of authority in England (Weatherhill 1996: 169) and increasingly obtained more power in parliament throughout the seventeenth century (Johnson 1996: 32). Below the gentry were professionals such as surgeons, lawyers and prominent merchants all of whom were considered members of society's upper class despite their lack of land ownership (Wrightson 1986: 21).

The monarchy, aristocracy, gentry and the professionals represented the smallest portion of the English population but were the most powerful and influential people in its society. Those commonly referred to as the 'middling sort' represented a larger portion of the English population and form the second tier of its social structure. The most powerful among them were the yeomen; tenant farmers capable of amassing a comfortable amount of wealth and security (Johnson 1996: 33). This money could be spent on housing, maintenance, servants, furniture and a variety of other goods (Gaulton 2006: 11). Yeomen were occasionally seen occupying minor parish offices, thus yielding some amount of influence upon members of the community (Johnson 1996: 33). Husbandmen were also hard working tenant farmers who held lesser amounts of wealth and security compared to the yeomen. City dwellers such as burgesses and freemen are also considered part of the 'middling sort' (Ibid., 34).

The upper middle class (yeomen) together with the upper class made up only one third of England's total population in the pre-industrial era. The remainder of the population was represented by the husbandmen and those of lower social ranks, mainly servants and labourers

(Johnson 1996: 33). Servants and labourers were typically hired by the yeomen and gentry to work on the farm or in their houses. Not to be confused with slaves, servants were typically adolescents and young adults who signed contracts with their employers and worked for wages, as well as being provided with food and lodgings. They often lived in the homes of their masters and were considered a part of the household. Young adults would save up their wages until they had enough money to marry and begin a household and farming venture of their own and in many cases would eventually be able to hire servants themselves. The nature of servitude in pre-industrial England suggests servants represent more of an age grade than a social status (Ibid., 33). Labourers represent those working on others' farms for wages used to sustain their own households. These people typically did not have farms of their own or they may have tended to common pieces of land with other labourers (Ibid., 34). At the bottom of the English social ladder was a growing group of people often referred to as "masterless men". Essentially, these were social undesirables such as vagrants, rogues and vagabonds who didn't participate in English society according to its commonly understood patriarchal and economic rules (Ibid., 34).

3.3.1 Social Structure in Ferryland

The daily way of life for any individual living along Newfoundland's English Shore was strikingly different from the daily routines of a country household back in England. The slight modification to the English social system transposed onto Newfoundland's coast reveals the unique situation found in these small and isolated communities. Ferryland is best described as a small and simplified version of English society as it had members from all three tiers of social stratification; the upper, middle and lower classes, but it lacked the clear presence of government and the notion of upper status was not always defined by land ownership (Pope 2004). The middle class was well represented on the English Shore by the 'planters', who are described as occupying a similar social niche as the yeomen in the English countryside (Ibid., 261). Planters were resident boat-owners, and much like the farmers who hired labour for the farm, planters hired fishermen, to man their boats, and catch and process fish (Ibid., 1). A planter's household, was in effect the basic building block of the fishery's economy. All planters were boat keepers and nearly all boat keepers were employers (Ibid., 259). In terms of wealth, the average planter can be compared to a butcher or innkeeper (Ibid., 261).

The lower classes on the English Shore were represented by the servants and fishermen who made up most of the population, especially during the summer fishing season. The majority were predominantly young males from England employed by local planters to work in the fishery. Like in England, servants became part of the planter's household, heavily contributing to its economy and well-being (Pope 2004: 259). Seventeenth-century Newfoundland did not have any of the so-called 'masterless men' present in its society (Ibid., 255).

George Calvert was the highest socially ranked resident Ferryland has ever had. Originally from more humble beginnings, he eventually became a powerful individual, serving as James I's Secretary of State. He owned land in Co. Longford and Co. Wexford, Ireland including a few villages, castles and large homes (Krugler 2004: 86). Once given the title of Lord Baltimore, Calvert may be considered part of English aristocracy according to the criteria set out by Johnson (1996) and the most high ranking member of English society to step foot in Ferryland in the early seventeenth century. Those in charge during his absence (Edward Wynne, Arthur Aston and William Hill) were naval and military Captains and not members of the English gentry. However, the authority given to these men likely provided them with considerable influence among Ferryland's residents.

Sir David Kirke qualified as both a merchant and a member of the gentry (Pope 2004: 268). Although primarily a merchant, the power invested in him by the Newfoundland Grant, his importance in the development of the region's economy, and his close relationship with the King makes David Kirke an excellent example of what is known as a member of the Merchant-Elite (Ibid., 268). Pope (2004:269) describes this group as 'pseudo-gentry' for they behaved like members of the gentry even though they didn't own large estates.

Once David Kirke departed Ferryland, the colony's affairs were taken care of by his wife, Lady Sara Kirke and his sons. Lady Sara Kirke and her sister, Lady Frances Hopkins, were both literate and well connected women, not the typical planter housewives normally seen in the seventeenth century (Pope 2004: 271). After the deaths of their husbands and the restoration of the English Crown, these two sisters retained control of their large plantations, remained head of their households and were community leaders. These two women were also considered members of the Merchant-Elite (Ibid., 300, 303) and Lady Sara Kirke is considered one of the first female entrepreneurs of English North America (Gaulton and Tuck 2003; Gaulton 2006).

The following excerpt from Pope (2004:255) nicely summarizes the social situation seen in Ferryland in the mid seventeenth century:

> *In 1639, Newfoundland's English Shore was a simple society. It was small, and it was in effect, a part society: the social structure could take the form it did only because more complex societies existed elsewhere. Newfoundland lacked kings and parliaments, but not the authority of kings and parliaments; it lacked vagrants and beggars, but not the threat of being returned to a life of vagrancy and beggary. The English Shore lacked a gentry in the strict sense, for land was not the basis of wealth but it did not lack a class of merchants who behaved like gentry.*
> –Peter Pope (2004: 255)

3.4 Consumption Theory

The study and application of consumption theory is common to and has a theoretical basis in a variety of disciplines such as marketing, economics, psychology, sociology, anthropology, and increasingly, archaeology (Groover 2003; Klein and LeeDecker 1991; Spencer-Wood 1987; Wurst and McGuire 1999). The study of the consumption of goods is actually the study of the human behaviour and the thought process(es) involved in making the decisions to purchase goods and/or commodities. Consumption theory holds that people purchase/acquire goods, ideas and/or services to satisfy their needs and that these needs are unique to the individuals acquiring them. These needs are determined by the individual's identity which itself is based on a number of different factors such as social status, gender, wealth and lifestyle (Henry 1991: 3). Consequently, the association of identity with material goods has resulted in archaeologists, particularly those working in the historic period, attempting to reconstruct identity through the analysis of artefact assemblages with varying degrees of success (Spencer-Wood 1987). However, direct links between artefacts and personal identity such as socio-economic status or gender are often difficult to neatly define. One issue involves the nomenclature of the theory itself which studies 'consumer choice'. The word 'choice' here implies that individuals are free to make whatever choice they please in acquiring goods or services when this is in fact not the case. Factors which are sought to be described by archaeologists, such as status and wealth, are important psychological/social influences that affect consumer behaviour along with other more obvious factors such as the availability of disposable currency and, perhaps more importantly, whether or not commodities are even available in the local markets or environment for consumption (Spencer-Wood 1987: 6; Wurst and McGuire 1999:193). Another important issue whose solution has reached a consensus among the majority of archaeologists is that an archaeological assemblage can rarely ever link a deposit back to a single individual, however, archaeology can often link assemblages to the second lowest grouping in historical archaeology, the household (LeeDecker 1991).

According to the universal law of society during the late sixteenth and early seventeenth century, it was custom for high status households or families to unmistakably display their high class lifestyle (Laslett 1984). Discernable displays of wealth for the gentry include superior clothing, stately homes with impressive furnishings, a wide-ranging diet and many servants (Gaulton 2006: 10). The presence, quality and/or quantity of selected goods in seventeenth-century English households does indeed reflect social status, according to Weatherhill (1996: 183) but not in the way one might expect. Interestingly, according to probate inventory records, the gentry did not own the highest number of goods or the most high quality objects. Lesser-ranking merchants are recorded as owning more expressive or decorative goods including china, pewter, earthenware, pictures and looking glasses (Ibid., 169). Although some have suggested this as a form of social emulation of the merchants towards the gentry, a better explanation is the fact that the merchants had greater access to the new and better commodities as part of their careers (Ibid., 169, 183). Yeomen, on the other hand, generally fit within the expected level of consumption, owning fewer new and decorative goods relative to the gentry and the upper-middle class tradesmen (Ibid., 172). Pope (2004: 348) notes that the ready access to new and different goods among merchants seems to be especially true in maritime societies such as Ferryland, where new materials made their first appearance and were often purchased by merchants long before they became common or fashionable in larger English society.

According to Gaulton (2006: 15-16), seventeenth-century Ferryland residents were still very well connected to their English parent culture and its notions of social status and proper behaviours related to socio-economic situations. Nevertheless, the same material culture used to display social status would have served different purposes and taken on new meanings in a New World colonial setting such as Ferryland. Foodways represents one area in which archaeology has significantly contributed to our understanding of historic consumption patterns as they relate to socio-economic status (LeeDecker 1991: 30). The faunal remains recovered from the Mansion House in Ferryland offer the opportunity to investigate the relationship between foodways and socio-economic status in a unique colonial setting. However, life in a new part of the world, with a modified social structure and different patterns of access to foods suggests that food consumption patterns similar to those found in contemporary England may not occur. Sir George Calvert, a member of the English gentry/aristocracy and Sir David Kirke, a powerful merchant who behaved like a member of the gentry, are the two most powerful and consequential proprietors of Ferryland and both men resided in the Mansion House. Their high socio-economic statuses suggest that both of these personalities were likely to consume a conspicuous amount of goods, perhaps more so in the case of Sir David, an affluent merchant. Excavations so far, seem to reveal this pattern with a larger quantity of high-status goods originating from Kirke period deposits (Gaulton 2009, personal communication). Therefore, one would expect that food consumption patterns also reflect, in some way, the lifestyle of people who believed themselves to be of superior social standing and felt the need to display this fact. However, here is where living in a New World setting may have an effect. Access to various species was dependent on different rules and circumstances from what was seen in England as is discussed in the following section. Shammas (1990: 130) notes that the levels of food consumption might not be the best way to identify social status. She believes food to be 'inelastic' in comparison with other goods in that everybody needs to eat during times of ration and food scarcity and that people, no matter what their socio-economic status, can only eat so much when times are good. Although archaeological studies have shown that differential access to foods based on socio-economic status is possible (Reitz 1987; Schulz and Gust 1983; Singer 1987), the question remains; did the upper class families who inhabited the Mansion House in Ferryland consume a diet in a way that differed from other social classes at the site?

3.5 Seventeenth-Century English Agriculture and Foodways

Seventeenth-century arable agriculture is marked by a change in crop production patterns concerning both the introduction of new grains, vegetables and legumes and improvements in the agricultural methods from those previously seen in Tudor and medieval times (Thirsk 1990). Barley, wheat and rye were the most popular cereal crops in England (Ibid.). The production of wheat increased throughout the century whereas the popularity of rye decreased (Drummond and Wilbraham 1991: 92). Oats were important in the western and northern highlands but were normally considered secondary crops (Thirsk 1990). Corn was an expensive commodity towards the beginning of the century because of an increase in population leading to a higher demand for the product (Drummond and Wilbraham 1991: 91). Many rural farmers saw an opportunity here and began dedicating more and more of their land to corn, whose production increased steadily throughout the seventeenth century. The steady increases in wheat and corn production lead to a decrease in their market values and that of related products such as bread (Ibid., 91). Secondary crops of legumes such as field peas, beans and, occasionally, lentils were often grown although not so much for human consumption but as winter fodder for farm animals (Thirsk 1990). Despite its popularity in Ireland, the production of potatoes in England was really only encouraged towards the last quarter of the seventeenth century to serve as a cheap and easy to grow food to feed the poor (Drummond and Wilbraham 1991: 93).

Private kitchen gardens became very fashionable in the seventeenth century especially among the wealthier citizens who could afford to have large, well planned and fully stocked gardens to grow vegetables and fruits (Drummond and Wilbraham 1991: 95). Among the garden plants that could be found in any kitchen garden were root vegetables such as carrots, parsnips, turnips, and onions. All of those vegetables as well as cabbages were known as 'pot herbs' because they were normally added to pottages, stews or other boiled meat type dishes (Anderson 1971: 219). Legumes such as peas and beans were commonly found in kitchen gardens (Drummond and Wilbraham 1991:95) and these were also used in pottages although beans were often baked (Anderson 1971: 21). Other garden vegetables included beets, endives, spinach, asparagus, artichokes, cucumbers, melons and pumpkins (Drummond and Wilbraham 1991: 95). Many of these were eaten fresh either individually or in the form of a salad flavoured with an oil or vinegar and some spices (Markham 1615: 39-40, in Miller 1984). The wealthier estates often featured glass houses in which were kept delicate fruit plants such as vines or peaches, nectarine, orange and lemon trees (Drummond and Wilbraham 1991: 95). Fruits were consumed fresh, cooked, dried or preserved (Wilson 1973: 310-315).

Producing enough winter fodder to sustain herds of cattle, sheep and other farm animals was always a principle concern for the seventeenth-century English farmer. In an attempt to improve winter feeding conditions, farmers in England used natural water meadows to flood areas of pasture therefore protecting them from the frosts and allowing growth to continue longer through to the winter and permitting a return to pasture approximately one month earlier in the spring (Whitlock 1983: 121-123). Perhaps one of the most significant improvements to seventeenth-century farming techniques did not appear until later, towards the end of the century, when farmers discovered that they could support a larger number of cattle in good health throughout the winter if they fed on turnips. Turnip production increased significantly and the roots were harvested and stored in dry soil or sand to later be fed to the animals (Drummond and Wilbraham 1991: 92-93). However, turnips were not a common crop in south-western England until the early eighteenth century (Grigg 1989: 49). Other legumes introduced during the seventeenth century to help solve the winter fodder dilemma include Dutch clover, trefoil, sainfoin and lucerne (Trow-Smith 1957: 257).

Despite the amount and variety of cereal grains, legumes and vegetables normally produced in the seventeenth century, the consumption of meat was central to the English diet. However, the improvements seen in arable agriculture were not paralleled in animal husbandry techniques as no real efforts were made to improve stocks by selective breeding and the ability to carry large herds was not possible until the increased production of turnips later in the seventeenth century (Drummond and Wilbraham 1991: 97). To cope with this situation, most farm animals were culled before the arrival of winter when they were at their fattest. Old and weak animals were also killed at this time as they had the lowest chances for survival and would only have taken away food from the other animals (Ibid., 97). Nevertheless, meat was the mainstay of English diet and the main course in every meal for those who had access to it. Cattle and sheep represent the most important animals in English animal husbandry although it wasn't until later in the sixteenth and early seventeenth century that they were considered as important for their source of meat as they were for the other products and services they offered

(Trow-Smith 1957: 173). Before then, meat was only seen as a by-product obtained when the animal was too old and weak and no longer useful in providing the product(s) they were kept for. Swine, goats, pigeons, chickens and occasionally geese, ducks and rabbits are some of the other livestock commonly raised by the English farmer in the seventeenth century (Thirsk 1990; Thirsk and Cooper 1972: 166-167).

Cattle were the most desirable animals on the farm because of the myriad products and services they can provide (Thirsk 1990; Trow-Smith 1957: 250). Oxen could be used to plough the fields (Thirsk 1990), bullocks and calves could be fattened for meat (Trow-Smith 1957: 239), cows produced milk which could be transformed into other dairy products (Ibid., 238) and their manure could be used to fertilize the soil (Thirsk 1990). Other dairy products produced from a cow's milk included buttermilk, curds, butter and cheese (Wilson 1973: 158-163). A cow's most productive lactation period occurred when it was around six years old. Few farmers kept their dairy cows past the age of twelve years although it is reported that some were kept for 18 to 20 years (Trow-Smith 1957: 238). Bullocks [young bulls or castrated males] were usually not ready for beefing until they reached about four to five years of age (Ibid., 239-240).

Sheep were the second most important farm animal in the English countryside during the seventeenth century and were valued for manure, wool, and lamb and mutton meat (Thirsk 1990: 41; Urquhart 1983). It is difficult to say to what extent the seventeenth-century flocks differed from their sixteenth century and medieval predecessors, that is whether or not sheep were being kept for several seasons allowing for numerous shearing opportunities or whether or not more of them were being fattened earlier for their meat (Trow-Smith 1957: 238). The market for wool and wool products was on the decline in the 1600s but had not entirely disappeared (Thirsk 1990: 190-191). Conversely, demand for mutton, the meat of adult sheep, was on the rise (Trow-Smith 1957: 247). The meat from a young lamb was always considered far superior than that of an adult and the meat from a suckling lamb was considered more delectable to that of a grass or grain fed lamb (Thirsk 1990: 41). Females were more important to the flock as they were the ones who could produce the lambs; typically one ram was kept for every thirty ewes (Trow-Smith 1957: 242). Females were classified by age; they were named 'gimmer lambs' from birth to clipping time, 'gimmer shearlings' from clipping time to its first shearing and were considered ewes after being shorn twice (usually at about 27 months of age) (Ibid., 242). Shearing normally took place in mid-June (Thirsk 1990: 41). The following seventeenth-century poem was quoted in (Trow-Smith 1957) and describes the life stages of a ewe:

> *A four-shear ewe is in her prime*
> *A five shear ewe in lambing time*
> *As good; six past she will decline*
> *Ere seaven come, away with thine.*
> *Yet many men (for profit) keep*
> *In warme low grounds and pasture sweet*
> *An eight, a nine or ten shear sheep*

Lambing in southern England normally took place sometime between late January and early March. However, certain breeds commonly found in the Dorset area and other parts of south-west England lambed as early as November (Thirsk 1990: 41-42). Often regarded as a particularly weak animal prone to diseases, many were culled upon the arrival of winter while the others were kept inside stables or byres where they fed on grass, hay, chaff, peas or mashes of barley, beans and acorns (Ibid., 41-42).

Swine were popular animals during the seventeenth century and at least a few were commonly kept by the majority of households (Miller 1984: 70). Most middle and some lower class families could keep small numbers of pigs as they were easy to feed, fattened quite easily and in need of a minimal amount of space (Trow-Smith 1957). Pigs could feed on almost anything and one need not worry about their ability to amass winter fodder for their small pig stocks. Pigs were kept largely for domestic consumption whereas any large scale commercial production could only be done by the large farmers. Perhaps Markham said it best describing swine as '*... the husbandman's best scavenger and the huswives most wholesome sink...*' (Markham 1615, in Miller 1984) since they could be fed on pulse, chaff, barn dust, farm waste and the whey by-products from the dairy industry. They could also be fed from the household's kitchen waste and other garbage. Pope (2004: 344) considers swine as the perfect accompaniment to the cod fishery as they could be well fed from the fish waste produced when processing cod. A sow, could easily produce two litters in a 12 to 14 month period and pigs were taken for meat consumption throughout the year as they became ready (Trow-Smith 1957: 252).

The horse was the most respected of all farm animals, useful in agriculture, transportation and in the military. Its agricultural role was likely the least important as ox were still predominantly used to plough the fields (Trow-Smith 1957: 252-253). Transportation remained the horse's predominant function (Ibid., 252-253).

In England, the four seasons defined the life and daily tasks of the typical yeoman farmer; the winter season ran from late October to early February, the spring from February to late April, summer from May to early August and the fall harvest season from early August to October (Anderson 1971: 86). The widest variety of food was available to the yeoman family during the winter, especially right after harvest (Miller 1984: 86). Grains and fruits were plentiful as were fruit drinks and other related products. The dairying season which ran from May to September left most households with a good supply of butter and cheese. Many animals were killed and butchered in November while they were at their fattest. The majority of this meat was preserved but the body parts that could not so easily be conserved, such as the organ meats, the blood and other small cuts, were immediately consumed (Miller 1984: 86-87). By the arrival of spring, meat supplies were normally still well and good but the household began seeing a shortage of vegetables and fruits as well as fresh cuts of meat (Miller 1984: 87). The period of Lent was observed during the spring, forbidding the consumption of any meats other than fish (Miller 1984: 87). The summer was the leanest time of the year in terms of diet as stored food supplies were running low and new crops were not yet ready for consumption. The fall harvest period was marked by a significant increase in the availability and variety of fresh foods available (Ibid., 89).

Anderson (1971: 86-87, 110-115) notes that four methods were commonly used to preserve meats; drying, salting, pickling and potting. Drying was mostly used to store grains, legumes, and fruit products. Meat was more commonly kept by salting either dry or in brine. Brined meat products included corned beef, ham, and salt pork whereas dry salted beef was referred to as 'powdered beef' an item which supposedly stored well. Pickling was a method often used to preserve vegetables, oysters and some meats. Potting was also a very successful and commonly used method that saw cooked pork, beef or chicken placed in an earthenware vessel and then carefully sealed with some type of fat. Potted foods tended to preserve longer and were favoured for long sea voyages (Ibid., 105).

The gentry held a different world view compared to those of lower socio-economic rankings and as a result had a different outlook on life, a different way of behaviour, different forms of dress and different dietary habits (Laslett 1984). As was previously mentioned, meat was the mainstay of the English diet. Therefore, it comes as no surprise that the amount and variety of meats consumed in one's diet was a reflection of one's standard of living and socio-economic status (Drummond and Wilbraham 1991: 101). The upper classes ate well, they owned the land on which the crops were grown and where the animals were raised. They also had the disposable income with which they could purchase food. Their meals were inspired from medieval traditions and strongly influenced from continental Europe, especially France (Aylett and Ordish 1965, in Miller 1984). The gentry had a low opinion of vegetables which were normally only taken as ingredients for broths and other meat dishes or the occasional salad as the latter became increasingly popular later in the century (Drummond and Wilbraham 1991: 110-111). Breakfasts were taken early, relative to today's standards, at about six or seven o'clock in the morning and typically consisted of cold meats, fish (dried or salted herring was popular) and cheese served with beer or ale (Ibid., 106). Dinner was the principle meal of the day in which the most food was consumed, sometimes even necessitating a break during the meal to digest before continuing eating. This meal was served at about mid-day. Supper was taken later in the evening and represented a more moderate affair. Examples of warm meat dishes include: 'hot shoulder of mutton, a good pie baked of leg of mutton and roasted chickens eaten with bread' (Ibid., 106). The favourite English method for cooking meat was by roasting it, which could be done for most meats such as 'mutton, beef, pork, veal, capon, swan and other fowl and venison' (Markham 1615, in Miller 1984). Boiling, was another common but less favoured method of cooking meats, and was particularly appropriate for preparing salted meats

(Miller 1984: 83). Pies were another favourite food that could be made from any sort of meat and frying was a fairly common cooking method (Ibid., 83).

The urban lower classes mostly ate bread, salt or pickled herring and cheese. Every once and a while some might be able to afford the cheaper cuts of meat such as a sheep's head or pig's hooves (Drummond and Wilbraham 1991: 100). Many of the labourers and lower class villagers consumed broths made with beans and salted meat or whatever animal they could trap or snare (Ibid., 99).

Unfortunately for members of the lower class, hunting or trapping wild game proved to be difficult and even illegal. During the seventeenth century, deer and wild game were only found in the royal forests and the gentry owned private parks therefore restricting access only to those who owned the lands (Longrigg 1977: 71). These large private parks and forests were not enclosed and the animals were free to travel amongst them. The upper classes worried that those from the lower and middle classes would be catching the free game. Therefore, a law, with precedence in the sixteenth century, was passed again in 1671 making it illegal for anyone who makes less than £100 a month to catch or even consume any wild game (Ibid., 71). In the rough economic times of the seventeenth century when corn stocks or animal stocks owned by the gentry did not do so well and little profit was had, a variety in the diet was seen as a 'consolation' and wild game became invaluable to the gentility who considered them luxury foods and often gave some away as gifts (Thirsk 1990: 197).

In the seventeenth century, venison represented the favourite meat of the gentry and nobility and a food staple throughout the winter months (Drummond and Wilbraham 1991: 98). Hunting red deer, roe deer and even hunting wild hare represented the most dignified sport at the time (Longrigg 1977: 76). During the first half of the century, foxhunting was relegated to the country gentlemen and yeomen, not enough of a noble sport for the more 'sophisticated' urban gentleman; however, by the second half of the century, the sport had 'acquired royal and ducal glamour' (Ibid., 79). Otters, martins, badgers and weasels may have represented occasional chases but never really garnered the full attention of the upper classes (Ibid., 79). Wild birds, on the other hand, represent a particular favourite of the gentry, especially pheasants, partridges, wild grouse, wild ducks and woodcocks, all of which were named under the law protecting them from being hunted by the 'poorer sort' (Ibid., 90). Prior to the arrival of the seventeenth century, the hawk and the crossbow served as the primary means with which to catch wild birds. This practice gave way to the rifle after the year 1600 and archery itself quickly became a gentleman's leisure sport, practiced on one's lawn like a game of croquet (Ibid., 88). A rifle was loaded with special bird shot and the gentlemen went out into the forest, usually with canine companions where he waited to shoot the birds when they were on the ground. A good hunter would try to get as many as possible with each shot (Ibid., 89). Occasionally, nets or dogs were used to catch the birds or hawks were tied on a string and set off to fly above thus preventing the birds on the ground from taking off into flight (Ibid., 90).

3.6 Food Preparation Equipment

The following section briefly discusses some of the seventeenth-century butcher's tools commonly used to kill and dismember livestock. The butcher's axe, an item somewhat resembling what we today consider an axe to be, was the instrument used to first kill or 'bleed' the animal and then dismember the carcass by cutting through the larger, thicker bones and joints. The axe could also be used to further cut the animal into smaller 'more vendible pieces' (Alcock and Cox 2000). The butcher's cleaver was a finer tool and much lighter than the axe. Its wide but thin blade was useful for cutting through the smaller bones and weaker joints. Cleavers did not carry the same weight behind them as an axe and therefore were not as useful for disarticulating the larger joints. Cleavers were also used to mince and shred the meat off the bone and cut it into smaller pieces such as would be used in pies. Knives typically had thinner and finer blades that were not as wide as that of a cleaver. They were equally used to mince and shred the meat off the bones (Alcock and Cox 2000). Hooks were used to hang carcasses while the butcher worked on dismembering the animal or they were used to display various cuts of meat for sale, they could be pierced through the meat or the bone (Alcock and Cox 2000).

3.7 Food in Ferryland: Historical Evidence

Fortunately, some of the details regarding the domesticated species of plants and animals present in Ferryland during the seventeenth century, as well as accounts of other foods transported to the community from various other locations, are documented in the historical records. Although these do not provide us with any information as to who was eating what or give details as to how meals were prepared, they do provide us with an idea as to what food items were being transported to the colony, which crops were grown and which animals were being raised. Early correspondence between the colonists and George Calvert provides us with information about early subsistence practices in Ferryland and details as to when specific domestic animals first arrived to the colony. Later censuses provide us with a sense of livestock population sizes while import and export records supply us with information about the commodities brought into the community.

In his first letter to George Calvert, written shortly after his arrival to Ferryland in the summer of 1621, Captain Wynne mentions that seeds of wheat, barley and rye which were accidently transported in salt mats have begun to grow randomly among the grasses and in between stones suggesting to him that they should have no problems growing crops on that soil (Wynne, 26 August, 1621, in Pope 1993). Wynne's future plans for growing a variety of crops and to pasture cattle at the site are also made clear in the letter. However, he asks Calvert not to send him any cattle until the next season as he has not grown or collected enough fodder to sustain such large animals over the upcoming winter. Although there is no specific mention as to when the first cattle were transported to Ferryland, it is safe to assume that if Calvert listened to Wynne's request, then cattle were not present for the first year of occupation. Captain Wynne does ask his sponsor to send some goats, rabbits, pigs, geese, duck and hens but whether or not he received all or any of these is unknown. Wynne specifically states that he wishes to breed rabbits on the site and that he already has at least 12 chickens which he received from other boat-masters upon his arrival to the area. In fact, a henhouse is one of the first structures built in the community. Captain Wynne also asks for a shipment of meal and malt suggestive of his plans for the brew house.

In the summer of 1622, after having spent one full year on the Avalon, Wynne discusses his first attempt at growing crops in Ferryland; at the beginning of the season, approximately two acres of wheat, barley, oats, peas, and beans were sowed as well as half an acre of corn. The peas and beans are said to be quite successful at the time the letter was written and the corn is said to be 'earing' (Wynne, 28 July, 1622, in Pope 1993). The captain notes they have erected a kitchen garden and planted it with lettuce, radish, carrots, cabbage, turnips and "many other things". In another letter written to Calvert, Captain Daniel Powell, who carried a new supply of men to Ferryland in the spring of 1622, recounts that three of the four ewe goats being transported to the community died during the voyage from England (Powell, 28 July, 1622, in Pope 1993). This is a rather revealing statement indicating that goats, or at least one goat, were present on the site by the spring of 1622 and the fact that only ewe goats were shipped seems to indicate that the colonists were not concerned with breeding the goats for their meat perhaps only requiring them for their milk and/or wool, that is assuming there was no ram already present on the site.

Captain Wynne sent another letter to Calvert later that summer where he provides an update on the status of his crops (Wynne, 17 August, 1622, in Pope 1993). He mentions that the wheat, barley, oats and beans have been productive, as have the garden's beans, radish, kale or cabbage, turnips, carrots and "all the rest of like goodness". He discusses the vines [grape vines?] which came from Plymouth, as growing very well and notes that anything that can grow in England will do fine in Ferryland. He mentions that he has a three acre meadow which has produced enough hay for winter feeding, although he does not say for which type of animal or how many he needs to feed, and claims there is enough pasture to serve about 300 heads of cattle on the site. Wynne only asks for Calvert to send him some hemp and flax, a brewing kettle, and some grinding mills.

The first account of a European domestic dog present in Ferryland comes in a 1622 letter from Captain Nicholas Hoskins who mentions a few of them accompanying him on a hunting trip into the interior (Hoskins, 18 August, 1622, in Pope 1993). This indicates that dogs were present on the site early on and may have even come in with the original settlers or soon afterwards.

The first accounts regarding the presence of both cattle and horses at Ferryland occurs in William Alexander's text *An Encouragement to Colonies* where he notes the presence of 'a brood of horses, cows and other beastial' (Alexander, 1625, in Pope 1993). A letter written by Calvert himself in 1625 also indicates that he has contracted the ship *Peter Bonaventure* headed by Captain Sherwyn, to transport cattle over to the site. These historical records represent the earliest documentation of cattle and horses in Ferryland suggesting that they must have arrived on the site sometime between 1623 and early 1625.

When Sir David Kirke appropriated the Mansion House in 1638, a few of Ferryland's residents recall him also taking into possession diverse cattle and at least three or four horses which are said to have belonged to the Calvert family (Council for Cecil Calvert, 23 December, 1652; Pratt, 11 March, 1652, in Pope 1993). When the Dutch attacked the community in 1673, they destroyed some cattle and livestock and took with them six hogs and one bullock. In 1675, a survey of Ferryland conducted by Sir John Berry, Captain of the HMS *Bristoll*, counted thirty heads of cattle in all of Ferryland (Berry, 12 September, 1675, in Pope 1993). A survey in December 1676, by Captain John Wyborne notes a population of 32 cattle (Wyborne, 7 December, 1676, in Pope 1993). A 1677 census notes 27 cattle, 22 pigs and nine horses present in the community (Poole, 10 September 1677, in Pope 1993). This information suggests that Captain Wynne's original claims that the community was able to support over 300 heads of cattle likely never came to fruition and smaller herds of thirty or so are probably more reflective of the typical cattle population size at Ferryland.

Documents related to the importation and exportation of various goods and commodities to and from the community after 1638 attest to Sir David Kirke's abilities as a merchant and the new economic orientation of the community as a mercantile venture rather than a colonial enterprise. The items listed on the importation records also provide us with clues as to which commodities were most in demand by the community, perhaps because they couldn't produce enough or any of these items on their own. Imports to the community in 1639 included wheat, malt, peas, oatmeal, cheese, sweet oil, soap, butter, mustard seed, candles and wine vinegar (Pope 2004: 366). Based on this list, it would appear that the community was unable to grow enough wheat, peas and oats that year and that any dairying effort was unable to provide enough cheese or butter for the entire community. Pope (1986: 188) notes that the most commonly found earthenware vessels at the site are North Devon baluster-shaped tall pots commonly used in the exportation of butter from England. Ferryland's importance as a commercial trading port also meant the community served as a repository for various Old and New World goods such as wine, tobacco and sugar (Pope 1993; 2004: 155)

3.8 Catching and Processing Cod in Seventeenth-Century Ferryland

Fishing crews stationed in Ferryland had to row their boats three to four miles out to sea and back each day in order to access the best of the fishing grounds (Pope 2004: 22). Typically, each fishing boat would be staffed by three men, each of which held a couple of baited, wrought-iron fishing hooks attached to two or three weighted lines. Cod feed closer to the bottom of the ocean and the fishing lines were dropped over the side of the boat to the appropriate depth. Once hooked, fish were brought by hand (Ibid., 25-26). A boat could sometimes return with up to 1,200 fish on a good day (Ibid., 25).

Smaller species of fish such as Atlantic herring and capelin were used as bait for the cod fishery. These fish were normally caught using seine nets (Pope 2004: 28). Pope (2009) notes a

1618 account of planters harvesting sea birds and using their flesh as bait in the fishery. He further notes that the fishermen likely preyed on juvenile birds that were unable to fly and thus, easier to catch. The chicks would hatch before the arrival of baitfish and could thus provide a "head start" on the cod fishery. The ability of Europeans to catch adult sea birds (Hodgetts 2006) indicates that the flesh of adult birds were also available for use as bait. Pope (2009) argues that only a heavy and focused predation of immature seabirds could account for the large scale decimation of the seabird colonies seen in certain areas of Newfoundland.

Back on shore, fish were usually processed soon after arrival. Owing to the large number of fish that the boats could bring in daily, it is no wonder that the processing of codfish followed a format that much resembles a factory assembly line. Pope (2004: 26) details an account of the processing of codfish. First, a fish was placed on a table for someone named 'the header' who gutted and then decapitated the fish with incredible speed and dexterity. At this point, the liver of the fish was removed and all livers were collected into a train vat, their oil left rendering in the sun. The header proceeded to push the headless fish down the assembly line towards 'the splitter', whose duty it was to open the fish and remove its spine (Ibid., 26) removing all of the thoracic, pre-caudal and some of the caudal vertebrae (Butt 1979). The men assigned to both of these jobs were quite good at what they did and are described as being able to process one fish every four seconds. Therefore, only two shore-men were needed to handle the catch of a single boat (Pope 2004: 26). Fish heads and other waste were normally dumped onto the shore to be taken away by the tides (Butt 1979).

The split fish were then collected and neatly piled up for initial salting, also named wet-salting. This was an important step for the preservation of the codfish. Knowing the correct amount of salt needed for the corresponding size of fish and how to spread it evenly was crucial to the production of a marketable fish product (Pope 2004: 26-27). Two different market products could be produced from cod; the air dried or salt-cod and the wet-cured or corfish. The market for the wet-cured variety was not as large as that for the salt cod, but the fact that they did not take a long time to prepare, meant that codfish caught towards the end of the fishing season that did not have time to be air-dried, could still produce a profit (Ibid., 27). Corfish were sold at a lower price.

Producing salt-cod required a prolonged wet-salting period where, after a few days of wet-salting, the fish were rinsed with sea water and neatly piled onto prepared beach platforms made of beach stone or wooded platforms of fir or birch bark where they were kept until completely air-dried. At night or whenever it rained, the fish were turned skinned side up or were gathered and taken in. Once dried, the fish were piled in layers in groups of about 1,500 fish (Ibid., 28). During the early seventeenth century, the end of the salt cod processing season was normally finished by late July. The period of drying was extended by the end of the century as Captain Francis Wheler notes in 1684, that cod were dried until August 20th (Ibid., 29). The salt fish and wet-cured fish were taken over to European markets and the train vats of cod liver oil were brought back to Europe where it was used as a lubricant for heavy mechanisms (Ibid., 29).

3.9 Foodways of the Elite in Colonial North America

Surprisingly, despite the amount of archaeology performed on British colonial sites in North America, particularly in the United States, little has been done with regards to the study of elite foodways in the seventeenth century. Henry Miller 's PhD research represents one of the best known studies on early colonial foodways in the Chesapeake area (Miller 1984). His research is a zooarchaeological study of a number of seventeenth- and early eighteenth-century households from James City County in Virginia and from St. Mary's City in Maryland. Among the assemblages he investigates are a number of elite or high status households. Although his research did not focus exclusively on the dietary habits of high status households and how they compared to lower status households, he did, nonetheless, address the issue. His main research question concerned itself with the foodways pattern related to colonization and the change in dietary habits through time as the colonizers became more familiar with and settled into their new environment. One of the hypotheses he investigates is that differences in foodways between groups of different socio-economic status will become more pronounced through time. This is based on his hypothesis that there was more social fluidity and equal access to resources at the time of initial colonization but that the social structure of the colony would become better defined through time limiting access to certain resources for certain groups of people (Ibid., 52). He interprets his results as indicative of initial subsistence strategies for colonists in a newly settled area being generalized thus reflecting the diffuse adaptive strategies employed to take maximum advantage of all of the resources available to them. He notes colonists took advantage of the new wild fauna available in the Chesapeake area as well as significantly relying on the British customs of consuming domestic animals such as cattle and swine (Ibid., 391). He finds that subsistence strategies become more stable and uniform through time. Regarding elite foodways, he finds that wealth related variations in diet and foodways became less pronounced through time, a finding that is contrary to his initial predictions. He notes that access to key resources was therefore unrestricted in this otherwise increasingly stratified society and that the assumption of subsistence differences based on differences in material culture is not always a valid one (Ibid., 393).

Two of the assemblages used in Miller's PhD thesis were highlighted in a comparative study specifically looking at food consumption patterns between social classes. Miller (1979) investigates the Pettus site, a late seventeenth-century plantation for a very wealthy landowning Virginian family, and compares it with the Utopia Cottage, located on land owned by the Pettus family and thought to be slave quarters occupied during the same time period. His investigation reveals that the Utopia site was not a slave residence but rather a household of tenant farmers. Tenant farmers were better off economically then slaves but still represent a household of considerably lower socio-economic status than the wealthy landowning Pettus family. The analysis of faunal remains from both sites reveals that the same species were consumed at both locations and they were consumed in relatively equal amounts with a focus on cattle and swine. Miller found no differences in the ages of consumed species nor did he find a difference regarding preferred cuts of meat between the two sites. Rather, meats consumed at both sites were of a similar quality, quantity and variety.

Therefore, the social stratification between the rich and the poor had become more pronounced by the end of the seventeenth century, the diets of middling and wealthy planters in the colonial Chesapeake area were archaeologically very similar. Both consumed the same variety of species and in approximately the same amounts (Bowen 1996; Miller 1979; Miller 1984). It is worth noting that there are some differences between the Chesapeake, New England and Newfoundland sites that may have affected the dietary habits of its citizens. Unlike Ferryland, the primary economic activities in these regions were not solely based on the fishery but rather on arable agriculture and animal husbandry. The primary factor for wealth was based on the amount of land that you owned on which to perform these activities rather than a larger number of boats that could catch more fish.

Chapter 4: The Mansion House and its Archaeology

4.1 A History of the Mansion House

The Mansion House was one of the largest and most visible structures in Ferryland throughout the seventeenth century. Its large size and central location made it a prominent structure in the landscape while its function as the residence of the colony's two most influential political figures made it an important symbol of power and high status in the community. Most of the key local leadership figures and their families are known to have once lived in this building and contributed to its associated archaeological deposits. While some of its other residents remain unknown to history, archaeology suggests they were of upper socio-economic status and likely important members of the community.

The concept of a household or a family, as defined in the seventeenth century, is different from what we in a twenty-first-century western society would normally consider a nuclear family to be; that is two parents and their children. A seventeenth-century household typically refers to the home-owner or male head of the household, his wife, their children as well as their servants (Pope 2004: 56). Pope (2004: 212) describes the regular planter household on the seventeenth-century English Shore as having an average size of 11.5 people. He presents the Dodriges as a typical example from the year 1677. Included were Mr. and Mrs. Dodrige, their two children and nine servants. It was a planter's responsibility to provide their servants with food and accommodations on top of regular wages. A planter's servants' lodgings were normally quite small providing enough space for four or five men. It was normal for the smaller planters not to have separate accommodations for their servants but to lodge them in their own houses (Ibid., 331).

First commissioned by Sir George Calvert, the Mansion House was to be his Newfoundland residence upon his and his family's arrival to the colony. It may have been smaller than the large manors or castles someone of his socio-economic status would have been accustomed to back in Europe but it was still a very large and well constructed home considering the circumstances of its colonial setting. It was first built sometime between 1623 and 1625 and depending on its date of completion, it is highly possible that Captain Edward Wynne and perhaps a few of his men, were the first inhabitants of the structure, as such a large and well built dwelling would surely not have gone unoccupied for very long. Upon Wynne's departure from Ferryland in 1625, the building would have been inhabited by the colony's new Governor, Arthur Aston. George Calvert visited Ferryland in the summer of 1627 and likely stayed in his own house. He took up residence in the Mansion House permanently (or so he thought) after moving in with his family and possibly some servants in 1628. Of course, circumstances that winter meant that the building did not function as the private residence for which it was intended, instead serving as a hospital for over 100 men, at one point over 50 at a time, a testament to the sheer size of the structure.

After departing Ferryland, Calvert is said to have given a patent to several of the smaller planters (William Poole, George Leese [George Lee], Sydney Taylor and Sydney Hill) who stayed in Ferryland, to take into their possession the Mansion House and all of Calvert's other belongings remaining in the community (Phillip Davies, 24 August, 1652, in Pope 1993). In a deposition given in 1652 for the civil case of Cecil Calvert vs. David Kirke, the Ferryland planter William Poole recalls that after Calvert departed the community in 1629, one Mr. Hoyle moved into the Mansion House (Poole, 24 August, 1652, in Pope 1993). This statement was also supported by Ferryland resident John Stevens (Stevens, 24 August, 1652, in Pope 1993). Poole further states that Hoyle "was afterwards carried away by one Ralph Morley" (Poole, 24 August, 1652, in Pope 1993). It is unclear as to whether or not Morley himself moved into the Mansion House or if he only removed Hoyle and the Mansion House was left uninhabited or occupied by someone else. In 1632, after the death of George Calvert, his son Cecil sent Captain William Hill to Ferryland as his representative on the island (Gaulton and Tuck 2003: 207). Captain Hill moved into the Mansion House until the appropriation of the colony by the Kirkes.

Sir David Kirke, his family and at least 30 servants, arrived in Ferryland in the summer of 1638, whereby Kirke unabashedly removed William Hill from the Mansion House (Pope 2004: 59).

> *Howbeit, not finding himself able to withstand the power of the aforesaid Sir David, the aforesaid Captain Hill* [went] *without contest into a little house adjoining and not being able to do otherwise yielded up the possession of the said chief Mansion House to the said Sir David Kirke, who forthwith took possession thereof and planted or placed himself, his lady and family therein,* [...] *Captain Hill retire*[d] *from the said other little house from which he went afterwards to the north side of the harbour, where after some years of dwelling he,* [...], *departed this life.*
> –James Pratt, 12 March, 1652. In Pope (1993).

Sir David and Lady Sara Kirke themselves did not live in the Mansion House for very long. Sometime in the 1640s Sir David Kirke commissioned another large structural complex to be built immediately next to the east wall of the Mansion House. This building was more than a simple residence for the Kirkes as it equally served members of the community with a built-in tavern. Archaeological evidence for various other activities suggests that parts of the building served for cooking, baking, dining, dairying, and sewing (Gaulton 2006: 265). Curiously, this building was never really mentioned in the historical documents and was only discovered archaeologically (Ibid.).

The series of tenants known to occupy the Mansion House is relatively complete from the time of the building's construction in the early 1620s through to the 1640s thanks to historical documentation. Unfortunately, no mention of the Mansion House's inhabitants after this time period can be found in those records and therefore the information must be obtained archaeologically. Inside the main structure were artefacts suggestive of a high-status occupation including examples of fine Venetian glass and a terra sigillata costrel. Terra sigillata is a thin bodied fine Portuguese red earthenware that has been described as having "limited practical utility" and a "conspicuous design" (Ibid., 219-221). It was popular among the Portuguese and Spanish elite at the end of the sixteenth century and so far has only been recovered in Ferryland and nowhere else in colonial North America (Gaulton 2006: 219-211; Baart 1992: 274).

Despite no longer being the most luxurious home in Ferryland, the Mansion House would still be the second-most coveted house in town. Taking this into consideration, as well as the building's proximity to the new governor's house, archaeologists suspect that the home was probably inhabited by one of the Kirke sons or possibly by Lady Frances Hopkins. David Kirke had four sons; George, David, Philip, and Jarvase and one elder daughter, born in England and never mentioned in any document pertaining to Ferryland (Tuck, et al. 2009). By the time of the restoration of Charles II to the English throne, most of the Kirke boys had reached adulthood and likely had residences of their own. George, the eldest son, would likely have received most of his father's possessions by way of primogeniture. In a 1660 letter to the king, Lady Sara Kirke asks for his majesty to name George as his representative in the plantation thus returning the Kirkes and the monarchy to power in Newfoundland (Kirke, 1660, in Pope 1993). It is also possible that Lady Sara Kirke herself inhabited the Mansion House until the 1680s. Archaeologists believe they will have more information as excavations progress (Gaulton 2009, personal communication). Lady Hopkins arrived in Ferryland in 1649 as a political refugee from the English Civil War. Her husband remained in England, where it is believed that Charles I resided in the Hopkins residence while under house arrest for the final few months before his execution. Lady Hopkins' husband likely followed the same fate (Pope 2004: 60).

In spite of the death of their husbands, both Lady Kirke and Lady Hopkins carried on in their role as planters each employing 25 and 15 men respectively in 1675 (John Berry, 12 September, 1675, in Pope 1993). George Kirke had 16 servants working for him at that time and David (II) and Philip Kirke together employed 25 men. A census taken during the winter of the following year indicates that David Kirke (II) had 20 servants, George had 17, Lady Kirke had 16 and Lady Hopkins had 11 (Wyborne, 7 December, 1676, in Pope 1993). A 1677 census noted how many planter houses were found in the community and how many structures each planter owned. Keeping in mind that the Mansion House complex contained one dwelling house, one or two store houses and possibly two servant's lodgings, Table 2 presents the housing situation in 1677.

Table 2: Planter Houses in 1677. From Poole (10 September, 1677, in Pope (1993).

Planter	Dwelling House	Store House	Servants' Lodgings
Lady Frances Hopkins	1	2	2
Lady Sara Kirke	1	2	1
George Kirke	1	2	2
David Kirke	1	2	2
Jarvase Kirke	1	1	-
William Robinson	1	2	-
William Tommes	1	2	1
Samuel Adams	1	2	-

4.2 Archaeology of Ferryland and the Mansion House

A number of small scale excavations were undertaken in The Pool area prior to the major excavations begun in 1992 (Tuck 1993: 295). These include test excavations on the south shore of the Pool conducted by the Historic Sites and Monuments Board of Canada during the 1950s which revealed some seventeenth-century artefacts. At around the same time, more test excavations were conducted by archaeologists from Memorial University of Newfoundland in an area close-by. A second series of excavations took place in the mid-1980s by Memorial University to locate some of the buildings mentioned in the historical documents and to assess site potential. These excavations confirmed the location of the site and its identification as Lord Baltimore's colony of Avalon (Ibid., 296). Funding was granted in 1991 which permitted archaeologists, under the direction of Dr. James A. Tuck of Memorial University, to undertake excavations on a larger scale beginning in the summer of 1992. Excavations have continued every summer since and a variety of seventeenth- and eighteenth-century structures have been fully excavated revealing a small seventeenth-century community built very much like an "English port town" with a stone quay and waterfront buildings along the inner harbour and rows of tenements, dwellings and outbuildings located on the south side connected by a cobblestone street (Gaulton and Tuck 2003; Gaulton 2006).

Determining the location of Calvert's Mansion House represents one of the many research goals of archaeologists working at the site since test excavations began in the mid 1980s. Portions of the Mansion House were first excavated in 2004 and thought to represent a portion of the kitchen built by Wynne's men in the early 1620's. A building fitting the description of the First House mentioned in Captain Wynne's 1622 letter to Sir George Calvert (*the which being 44. Foot of length and, 15. Foot of bredth*) was found in 2005. In was in that

Figure 2: Highlight of Area F at Ferryland with location of the Mansion House. Photo facing the southeast. Photographed by Gord Carter, Bank of Canada.

same field season that archaeologists finished excavating most of the Mansion House and realized that this was an early seventeenth-century residential complex and that its dimensions were much larger than those described in the historical records for the kitchen. The simultaneous presence of a larger, more solidly built house that easily dwarfed the living space in the First House lead archaeologists to conclude that this was Calvert's Mansion House.

The building was recovered in Area F. This is the largest area yet to be excavated at the site and represents what can be called the heart of the historic community. Highlighted in Figure 2, it stretches south from the modern road and east from a currently inhabited home up to and including the ditch and rampart fortifications at the eastern end of the site. Other than the Mansion House and its associated structures, this area includes the First House, the Kirke House, the bake/brew house, some other dwellings and tenements from the 1620s, a store

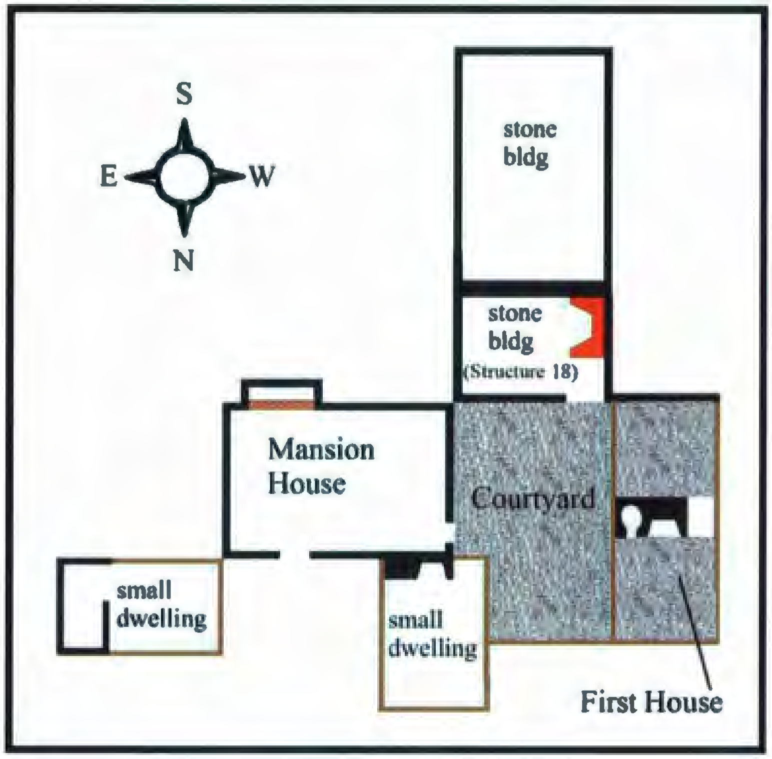

Figure 3: Schematic plan of the Mansion House and associated structures. Black lines indicate stone walls, brown lines indicate wooden walls, grey pattern indicates cobblestone floor. Figure not to scale. Modified from a figure provided by James A. Tuck.

house from the Kirke era, a large foundation impeded by bedrock believed to be an original attempt at building the Mansion House and a 30 foot section of the 13 foot wide cobblestone street.

Figure 3 represents a schematic plan illustrating all of the structures associated with the Mansion House complex. The structure identified as the "Mansion House" is also referred to as the main structure of the Mansion House complex and is the primary residence associated with this group of related structures. It measures 23 by 36 feet and is built with solid, two and a half feet thick stone walls. The amount of rubble found inside the home suggests that this structure

Figure 4: Examples of plaster used to line the interior walls of the Mansion House. Photo courtesy of James A. Tuck.

was a full two stories high and was covered with a slate roof. Floor joists and burnt floor boards were recovered indicating the presence of a wooden floor and the interior walls were coated with a limestone plaster (Figure 4). A subsurface stone drain was found under the floor to take away water runoff from the hillside located immediately to the south of the building. A large lateral fireplace was built along the southern wall; its hearth constructed using a combination of cobblestones and brick. The recovery of a large concentration of window glass on an elevated terrace located to the south-east of the building suggests that glazed windows were set in the walls of the second floor immediately west of the fireplace. Further evidence for glazed windows was found on the front (north side) of the structure. There were two entrances to this structure; the main entrance located in the north wall, leads out to the community while the second entrance located in the west wall, leads to a private cobblestone courtyard.

The courtyard was completely enclosed by surrounding stone and timber-framed structures and was only accessible from the outside via the main structure of the Mansion House. The northern limit of the courtyard was bordered by a wooden barrier (fence?) which may have contained a door or gate leading into the courtyard (Gaulton 2009, personal communication). Two other stone structures were located to the south west of the main structure and to the south of the courtyard. The first of these structures, also known as Structure 18, was itself only accessible through its entrance via the courtyard. Both of these auxiliary structures were constructed out of mortared stone. The larger and southernmost of the two measures 14 by 30 feet and has thus far received little archaeological attention and waits to be excavated. Structure 18 measures 14 by 19 feet and has been almost fully excavated. The remains of an 8 by 8 foot cellar were found from within this building. It is at least 8 feet deep (excavations were not able to reach the bottom due to safety concerns). A pile of broken and crushed brick in the building's southwest corner is possibly the remains of a collapsed fireplace, but this section is yet to be excavated. Notable artefacts recovered from this building include a brass ear pick and a large "DK" token, David Kirke's private currency (Gaulton and Tuck 2003). Many bits of cut lead waste were discovered in this structure suggesting that they were probably made here (Gaulton 2009, personal communication).

Two smaller buildings are located immediately outside of the Mansion House and likely served as tenements or servant's quarters in the seventeenth century. The first is located to the northeast of the main structure and measures 12 by 22 feet. It was a timber-framed building with a large gable-ended stone fireplace. Floor joists were recovered from within. The second small outbuilding is located to the northwest of the main structure and measures 13 feet wide, its length remains uncertain as the building continues underneath the present road and therefore it is not fully excavated. It was a timber- framed structure with floor boards still present and a small stone fireplace. A group of silver coins and a goldstone ring was found just north of the fireplace and another gold ring was found within the walls of the fireplace leading

Figure 5: Location of deposits analyzed in this study. Black lines indicate stone walls, brown lines indicate timber walls, grey pattern indicates cobblestone floor. Figure not to scale. Modified from a figure provided by James A. Tuck

archaeologists to believe that these represent part of a small cache hidden within the fireplace, part of which fell out when the building collapsed. These items may have been stashed here during the raid of 1696 as they were never recovered by their owner.

All faunal remains analyzed in this research project were recovered from various deposits associated with the Mansion House complex (excluding the possible servant's quarters). All of the soil was screened using a ¼" mesh screen. The following is a description of all of the events analyzed in this study. Figure 5 gives an approximate location as to where each deposit originated.

EVENT 613 – Outer East Wall Deposit

This event represents a Calvert and early Kirke era deposit found over the floor of what is believed to be a possible stable that was dismantled by the Kirkes in the early 1640s or 1650s. It is located immediately to the east of the main structure of the Mansion House and is believed to be a possible midden associated with the Mansion House.

EVENT 626 – Second Story Outer Wall Collapse of Main Structure

This is a deposit of clay, angular rocks and a large concentration of window glass found at the back, outer south-east corner of the main structure of the Mansion House. This is currently interpreted as a partial collapse of the back wall and window(s) from the second floor of the building. Other materials in the event may represent items thrown out from the upper floor window over the course of the building's occupation.

EVENT 627 – Collapse of Main Structure

This event is the wall collapse found inside the main structure of the Mansion House and represents its destruction during the French attack of 1696. The organic preservation of this event is quite good thanks to the finished plaster used to line the inside walls of the house. The materials found within the building could represent some type of refuse found on the second floor or be from materials that have fallen in from an outside deposit up on the slope south of the house.

EVENT 630/631 – Southernmost Stone Building

These two events represent the initial excavations of the southernmost stone structure which has yet to be fully excavated. The deposits were a consistent matrix of light brown clay and rocks with mortar and sand found on both sides of the structure's eastern wall. Event 630 represents materials found outside the structure and Event 631 represents materials found on the inside. At some point during the excavation of the structures, the events were lumped together and some animal bones were labeled as event 630/631. Both of these events likely represent the collapse of the stone structure and will be treated as one deposit for this analysis.

EVENT 632 – Collapse of Structure 18

This event represents the collapse of Structure 18, the function of which is as yet unknown. Event 632 contained stone mortar and a clay matrix with a fair amount of bone. Included in this collapsed layer may be some elements originally from an outside deposit located immediately outside of the structure that may have fallen in when the building collapsed in the French attack of 1696.

EVENT 633 – Main Structure's Hearth

This event is a clay and charcoal deposit from the fireplace in the southeast corner of the main structure of the Mansion House complex.

EVENT 634 – Interior Collapse of Structure 18

Event 634 is found immediately below event 632 and is also the result of the building's collapse. This event went at least eight feet down into the cellar. It is only differentiated from Event 632 by a lack of clay in its matrix. It likely represents the collapse of the interior of the structure with little or no intruding deposit from outside the building. Some of the materials originated from the second floor of the building.

EVENT 636 –Doorway of Structure 18

This is a thin occupation layer of a clay and sand matrix found on top of and among the cobblestones in the doorway of the northernmost auxiliary stone building.

EVENT 651 – Southeast Midden

Event 651 is a rich midden deposit found to the southeast of the Mansion House believed to be an accumulation of refuse thrown out of a second story window of the main structure of the Mansion House. A large amount of window glass was found in this deposit.

EVENT 652 – Decayed Floorboards

This event has a relatively rock-free dark organic soil matrix and was found inside the main structure of the Mansion House complex. It is believed to represent the decayed remains of the floorboards and any refuse that may have accumulated in between and underneath these floor boards.

EVENT 665 – Builder's Trench

This event is a mix of clay and shattered slate found in what is believed to be the builder's trench inside the main structure of the Mansion House. The trench is approximately one foot wide and one foot deep, the materials accumulated within are probably refuse from the construction of the building.

EVENT 678 – T-shaped Drain

This event represents materials contained within a T-shaped drain found inside the main structure of the Mansion House underneath the floor.

EVENT 696 – Cobblestone Courtyard

This is a layer of collapsed material, mostly wall rocks, fine clay and charcoal, found directly above the cobblestone courtyard.

EVENT 713 – Bottom of Cellar

This event represents a matrix of mortar, sticky clay, beach rock and brick fragments in what appears to be the lowest layer of the cellar in Structure 18. Its excavation is not yet fully complete.

4.3 Dating the Mansion House

I had the opportunity to examine the smoking pipe assemblage from Event 627, the collapsed interior of the main structure of the Mansion House complex. The materials found in this event were mixed in with the rubble of the building collapse leading to some uncertainty as to the origins of the recovered artefacts. Is this a refuse deposit that was on the upper floor of the building when it collapsed? Or did some material make its way from an outside midden and into the deposit after/during the collapse of the building? All smoking pipes from Event 627 were dated by the author through the identification of maker's marks and through the analysis of bowl forms using Atkinson and Oswald's (1969) typology as found in Walker (1977). The results are shown in Table 3.

Results show a wide range of dates present from the 1630s up to the eighteenth century suggesting that the deposit contains materials accumulated over this period of time. This suggests the deposit is not reflective of a single occupation period dating from the destruction of

Table 3: Dates associated with smoking pipes from event 627

Date	Number of Pipes
1630-1640	1
1630-1650	2
1640-1660	5
1640-1670	6
1660-1680	18
1690-1720	1
1700-1770	6

the structure but likely contains intruding materials from an outside midden deposit. The dates obtained from the smoking pipe assemblage hints at the occupation period that deposited most of the faunal assemblage being investigated. The majority of the assemblage is composed of seventeenth-century materials most of which date from after 1660, therefore, the period after Sir David and Lady Sara initially departed the Mansion House.

4.4 Previous Investigations Related to Foodways at Ferryland

Taking into consideration the more than seventeen years of archaeology at Ferryland and the number of students and research scientists that have been involved in the project, it is surprising to learn that there exist very few other archaeological studies related to the diet and foodways of the site's former inhabitants. Lisa Hodgetts' (2006, 2009) work with faunal remains recovered from the site represents the first and only other zooarchaeological analysis of materials from Ferryland. Faunal preservation at the site is generally poor and has not allowed for any other zooarchaeological study. An archaeo-entomological research project performed by Allison Bain (2007) revealed further information about general diet and food storage conditions at the site. Other than these two studies, most the knowledge related to foodways and dietary consumption patterns at the site comes from research based on historical documents (Pope

1992, 2004) or from the analysis of material culture remains recovered as part of larger research projects (i.e., (Crompton 2001; Gaulton 2006; Miller 2005; Nixon 1999; Stoddart 2000). Most of these projects were based on the analysis of ceramic vessels as these represent the most common form of material culture items found on the site that are related to foodways (Gaulton 2006: 148). Most of the vessel analyses are based on the Potomac Typological system (known as P.O.T.S.) (Beaudry, et al. 1988) further defined by Pope (1986) as it best relates to the site.

In his analysis of ceramic vessels from the Kirke House, Gaulton (2006: 152) believes the large number of milk pans recovered alongside a substantial amount of faunal remains from domesticated animals and the 1660 addition of a small dairy structure to the house makes a strong argument that cattle were kept by residents of Area F . He notes that someone in the household was likely involved with cultivation, based on the recovery of agricultural tools and that the recovery of horse shoes suggests the likely presence of a horse and a pony on the site (Ibid., 153). Over 3,000 fragments of small lead "bird" shot was recovered from the Kirke House perhaps hinting at the importance of bird hunting among members of that household (Ibid., 158).

In her analysis of a seventeenth-century planter's house in an area further to the north east of Area F, Crompton (2001) notes the recovery of commonly used kitchen items such as part of a copper kettle and an iron kettle hook aside from numerous other food preparation, cooking and dairying ceramic vessels. Animal and botanical remains were also recovered but have not yet been fully and systematically analyzed. Some of these faunal specimens were tentatively identified as rabbit, sheep, pig, cow, possible seal and large mammal alongside a good amount of bird and fish bones (Ibid., 216).

An analysis of entomological remains recovered from a privy was conducted by Bain (2005) with dates ranging from the 1620s to 1673. After 1673, the privy was used as a location to deposit animal waste from a nearby stable (Gaulton 1997). The beetle remains recovered correspond with Ferryland's environment suggesting an open, sparsely vegetated coastal region with cultivated regions and nearby wood-working areas (Bain 2005: 5). Pea weevils, insects that target pea crops and pea gardens were also recovered (Ibid., 7). The identification of Hair rove beetles leads Bain (2005: 7) to suggest this species was likely feeding on fly larvae, which themselves fed on meat or fish likely deposited in the privy as household waste. Hodgetts (2009) supports the idea of the privy being used to discard unwanted meats.

Various species of granary weevils recovered in large numbers throughout the privy deposit indicates the presence of cereal grains or grain products like flour or bread. The distribution of these species throughout the deposit suggests that grain product infestations were an issue which Ferryland residents needed to address on a daily basis (Bain 2005: 8). Other insects attest to the damp and mouldy storage conditions in which grain products were kept (Ibid., 9). Overall, Bain's analyses of entomological remains reflect a typical lower/middle class English diet of mostly peas and bread with little meat and some fish. Her analysis shows that residents had a problem with grain product infestation and mouldy storage conditions (Ibid., 10). The privy's location right next to the storehouse may further explain the presence of related entomological fauna in this deposit (Gaulton 2009, personal communication).

Hodgetts' (2006) analysis of animal bones has so far, provided the most information related to foodways at Ferryland. In her analysis she looked at four different middens, all of which are interpreted as domestic deposits. The first midden is associated with the bake/brew house structure first built by Captain Wynne and later demolished by Sir David Kirke sometime after his arrival in 1638. The second deposit was labelled an early midden which was at the time believed to be associated with Calvert's Mansion House. Further excavations reveal this to actually be a domestic deposit located along the north wall of the bake/brew house, also dating to the first half of the century (Gaulton 2009, personal communication). The other two deposits both date from the second half of the seventeenth century and the Kirke period of occupation. The first is a midden deposit associated with the Kirke House. The other deposit, which dates from about 1650 to 1696 based on pipe bowl analysis, was initially associated with a large kitchen structure. Further excavations indicated this structure to be the main structure of the Mansion House complex and this deposit is a midden located directly outside of its front door (Gaulton 2009, personal communication). Hodgetts' analysis of faunal remains from the front door midden of the Mansion House will be incorporated into some of the analyses performed in this research project. Hodgetts (2009) builds upon her previous work, correcting for the identification of the Mansion House and further adding the identification of remains from the Privy deposit to her analyses.

In both publications, she describes the exploitation of a wide range of mammal species, both wild and domestic, with a primary focus on the consumption of swine, cattle, caprines, caribou and seal, following that order of importance (Hodgetts 2006: 134). The recovered fish remains vary in importance ranging from 7 to 64 percent of a deposit's assemblage. A wide range of avian species were exploited, especially in the Mansion House's front door midden. She notes that hunting and food husbandry activities seemed to be scheduled around the labour intensive summer cod fishery in a manner that maximizes their consumption of fresh meat. She notes how most domestic mammals were likely culled before or during the winter as the inhabitants did not have the time to produce enough winter fodder to support large herds. She compares the early seventeenth-century deposits to the later ones looking for a change in consumption patterns related to the shift from a community oriented settlement towards a more individualistic, market based economy. She finds that the residents continually exploited the same principal animal species and in the same order of importance throughout the seventeenth century (Ibid., 134). Hodgetts (2009) discusses the inapplicability of Miller's (1984) model suggesting that as people settle into their new environment, they rely more and more on cultivated food products and livestock and less on wild resources. It appears that the climatic amelioration of the later seventeenth century does not correspond with an increased number of cattle remains in the assemblage and she attributes this to the select few mercantilists who were able to produce more cattle, possibly selling some of their stock to migratory fishing crews instead of spreading the wealth amongst the community (Hodgetts 2006: 135).

Chapter 5: Methodology

5.1 The Identification Process

Specimen identifications were made through direct comparisons to known species from an osteological reference collection. The greater the diversity of species in a faunal reference collection, the better the ability of the researcher to identify his/her specimens correctly to a specific taxonomic level. All land mammal and fish specimens were identified at Memorial University of Newfoundland's faunal reference collection located in the Department of Archaeology. It is a feasible collection for this research as it includes at least one example of most of the mammalian species that could possibly be found on the Avalon Peninsula or on an English farm during the seventeenth century. Its fish collection contains a few of the more economically important species that can be found off the Avalon's shores. Any fish or land mammal specimens that could not be confidently identified using the Memorial University collection as well as all seal and avian remains were later identified by the author at the Canadian Museum of Nature's osteological reference collection, located in the Édifice du Patrimoine Naturel building in Aylmer, Quebec, which houses a far more complete and extensive faunal reference collection.

Specimens were identified to as precise a taxonomic level as possible, the most precise being to the level of species. A systematic nomenclature based on the Linnaean system for taxonomic classification was used in this study for the naming of species. In this thesis, the common names will first be given along with the scientific name in order to allow readers without a zoological or zooarchaeological background the ability to recognize which animal species is being discussed and to avoid any confusion. Common names and the animal species to which they make reference can vary between cultures, even if two cultural groups speak the same language (Reitz and Wing 1999). For example, the ungulate species with the scientific name *Rangifer tarandus* is commonly called 'caribou' in North America, whereas the same species is referred to as 'reindeer' in Europe. In any such case where there may be ambiguity for the reader regarding which species is being discussed, the scientific name shall take precedence. It should be noted here that the common names found in the historical records may not refer to the same species that we today would associate by the same name.

At many times during the identification process, the degree of fragmentation or the portion of a skeletal element present did not allow for an accurate identification to the species level. In such cases, identifications were made as precisely as possible. Some cases only allowed for their identification to taxonomic class (e.g., mammal, bird, etc...) whereas other cases could be specified to the level of taxonomic family (e.g., a 'canidae' identification indicates a specimen belonging to the taxonomic family of dogs, wolves, coyotes and foxes). Sometimes, the specimen in question was complete enough for the identification to go one step further and eliminate certain members of a taxonomic family. Continuing with the previous example; if the specimen in question is too big to have originated from a fox, then the identification is given as '*Canis* sp.'. The initials "sp." positioned after a taxonomic category indicate that the identification may represent any species from that taxonomic group. In the case of the latter example, the possible species that fall within the genus "*Canis*" include dogs, wolves and coyotes but not foxes. In the event where identification is not completely secure but where the author is reasonably certain that the specimen is of the species to which it is identified, the initials "c.f." (Latin for *confere* (Reitz and Wing 1999)) will follow the identification.

The first step in the identification process is to determine the taxonomic class of the specimen in question, whether it represents the remains of a crustacean, a bivalve, a gastropod, a fish, a reptile, a bird or a mammal. The criteria used for classing specimens are summarized in Table 4. No amphibian species are native to the island of Newfoundland (Campbell, et al. 2004) and therefore are not discussed here. In the case where a specimen is so fragmented that it cannot be confidently identified to a taxonomic class, it is labelled 'indeterminate'. Crustacean remains are easily recognized by their chitin and calcium exoskeletons (Reitz and Wing 1999). Gastropods and bivalves are two different types of molluscs that produce a calcium carbonate ($CaCO_4$) secretion to form a shell. The shells produced by both classes can be differentiated from one another by their shape; gastropod shells have a spiral growth pattern whereas bivalves have symmetrical or asymmetrical paired shells (Claassen 1998). Osteichthyes, or bony fish, have cranial bones that are thin, flat and mainly composed of collagen giving them a more fibrous appearance (Wheeler and Jones 1989). Their vertebrae have concave surfaces on both sides giving them an "hour- glass" shape termed 'amphicoelous'. Bird bones reflect an adaptation to flight. They are light weight with a thin cortex, some being highly pneumatised with a large reduction in the amount of cancellous bone and are much less robust than their mammalian counterparts (Gilbert, et al. 1996: 11; Yalden and Albarella 2009: 3). Mammalian

Table 4: Summary of criteria used for determining taxonomic class. Modified from Reitz and Wing (1999: 41)

Crustacea	exoskeletons composed of chitin and calcium carbonate deposits
Gastropoda	shells made of a calcium carbonate precipitation, shape of the shell
Bivalvia	shells made of a calcium carbonate precipitation, shape of the shell
Osteichthyes	thin flat bone, amphicoelous vertebral centra, fibrous/woody appearance
Reptilia	recognition of the element
Aves	thin cortex, light weight, saddle-shaped vertebral centra
Mammalia	thick cortex, cancellous bone, complex vertebrae, differentiated tooth row

remains generally have a much thicker cortex and a stronger presence of cancellous bone (Reitz and Wing 1999: 41).

All records are kept in a Microsoft Access ™ database file where each entry/identification is assigned a unique identification number. Each entry includes a number of specimens indicating how many different specimens are associated with that entry and a fragment count indicating how many separate pieces of bone are included in each entry. Other information recorded in the database for each entry includes the proper provenience information such as the event and unit number as well as the catalogue number or any special excavation technique used in the specimen's recovery such as flotation or wet sifting whenever applicable. Other information categories found with each entry include: the identification information such as the identified class, species and skeletal element represented and information on whether the element it is a left, a right or a midline bone, the portion present of the element (proximal end, distal end, mid shaft, anterior/posterior surface, etc...) and an approximation of completeness given on a scale from zero to one, one representing 100 percent completeness. Whenever it was applicable, the approximate age, sex and taphonomic information was also recorded. A comments section for each entry allowed for the input of any other observation not fitting into any of the aforementioned categories.

5.1.1 Ageing

Determining the age at death of animals found in a faunal assemblage may well be one of the most valuable research tools a zooarchaeologist can possess. Age at death profiles provide information on animal husbandry practices such as how herds were managed, what role animals played in the economy (e.g., as a source of food or for its by-products), food preferences, and even at which times of year certain husbandry-related tasks occurred (Bowen 1975, 1998). Information drawn from age at death profiles provides clues on the seasonality of deposit (Bowen 1988, 1990; Landon 1996), and hunting patterns (Thomas 1969). Before recovering such information from the archaeological record, we must address two assumptions that are inherently being made when looking at age at death profiles (Maltby 1982). The first assumption is that the recovered zooarchaeological specimens used to construct the age at death profiles (teeth, epiphyses, etc...) are representative of the bones originally deposited on the site and that preservation of faunal remains is equal among all age groups and types of elements. Unfortunately, the long bones and epiphyses of juvenile animals are porous and fragile and therefore at greater risk to destructive taphonomic agents (Landon 1996). Further investigation of taphonomic processes acting on the Ferryland assemblage can inform us of the extent to which bones were subjected to destructive pressures and if many may be lost. Fortunately, mandibles and teeth are quite resistant to destructive processes (Binford and Bertram 1977: 109) and are one of the best sources of ageing information. The second assumption is that the original deposits are indeed representative of the kill-off patterns seen on the site.

These two assumptions need to be addressed here in order to ensure that the assemblages from the Mansion House are properly analyzed and interpreted. The best way to ensure this is to analyze a sample that is representative of the true assemblage. In this study I analyzed 100 percent of the faunal material recovered from the Mansion House and therefore sampling methodology is not an issue. Paying close attention to the level of fragmentation and the effects of taphonomic processes on the various deposits will help to better understand the extent to which materials may have been lost in or affected by the archaeological record. Teeth are an important source for ageing information as long as they are found within a mandible or maxilla. A high number of loose teeth present in a deposit is an indication that the elements to which they belonged have been destroyed (Maltby 1982: 82). All of this information helps assess whether or not the recovered assemblage is a good representation of the original deposits. In order to address the second assumption as to whether or not the assemblage from the Mansion House represents the true kill-off pattern of domestic animals at Ferryland, I will need to rely on the large size of the deposit being analyzed. I will also compare the age profiles of these animals to the age profiles identified in the three other areas of the site by Hodgetts (2006). A difference in age at death profiles suggests some other factor(s) might be playing a role in shaping some of the assemblage.

Any specimen that can provide information about the age of its progenitor is recorded. Ageing information comes from a variety of different sources using a variety of different methods. Gastropod, bivalve and fish specimens were not aged. Bird long bones, like mammal long bones, grow from primary and secondary centers of ossification. However, elements ossify very early in birds, 5-8 months in the case of domestic chickens (Reitz and Wing 1999:75) and evidence of epiphysial fusion disappears quite rapidly once fusion has occurred. Once at this stage, the bird is adult size and its bones stop growing (Ibid., 75). Bird bones will only be assigned to two age categories: Juvenile, for those exhibiting juvenile cortex, and immature or older for any other specimen. A variety of different ageing techniques were applied to mammalian specimens depending on which skeletal element or portion of a skeletal element is present. Dental eruption and attrition patterns were noted on any teeth or tooth bearing element and stages of epiphysial fusion were noted anytime one was present in a specimen. These will now be further discussed.

Ageing by Epiphysial Fusion

Long bones and some of the irregular bones such as the vertebrae and the bones of the innominate, grow from endochondral bone at different centers of ossification: a primary centre and two or more secondary centers (O'Connor 2000: 92; Reitz and Wing 1999: 73). As an individual grows, the secondary centers merge with the primary center and fuse together forming a single bone. The primary centre of ossification is known as the 'diaphysis' and forms the shaft of a long bone whereas the secondary centers form the epiphyses. A line of epiphysial fusion is visible on the bone at the location where both centers of ossification merge together. This line eventually disappears as the individual becomes a full adult. Not all bones in the body fuse together at the same moment in an individual's life, some epiphyses fuse early in life, while others fuse a lot later. Fortunately, studies performed on modern populations reveal the ages at which epiphyses fuse. Therefore, recovered fused and unfused epiphyses from the archaeological record can be matched with known ages of fusion. A summary of the age groups identified in a deposit for each species reveals the range of ages found in that deposit. Kill-off patterns are presumed if a certain age category dominates the assemblage.

Ageing a specimen based on the status of epiphysial fusion is quite simple. However, one must be explicit as to what constitutes a "fused" specimen and an "unfused" one. The method through which I go about assigning an age category to an individual specimen depends on whether or not that specimen's epiphysis is fused. I have decided to consider "unfused" any specimen where the epiphysis is completely detached or as being in the process of fusing. A fused epiphysis is one in which the element is completely fused and the line of epiphysial fusion is no longer visible. If an epiphysis and a diaphysis are found separately but clearly fit together, it only counts as one identification as suggested by Crabtree (1989). Whenever possible, multiple sources are used to derive ages of epiphysial fusion. Silver (1969), Chaplin (1971) and Maltby (1979) as summarized by Amerosi (1989) provide the information on the timing of epiphysial fusion used in this study for the domestic pig (*Sus scrofa*), the goat/sheep family (Caprinae) and the domestic cow (*Bos taurus)*. When different sources provide different age ranges for the timing of epiphysial fusion, the assigned age range of the specimen in question is taken as being between the lowest age and highest ages of fusion provided by the different studies (Appendix IX details which age ranges were associated with each skeletal element). No study has been published on the timing of epiphysial ages for Caribou (*Rangifer tarandus*), therefore information on the timing of the fusion of its epiphyses will be derived from white-tailed deer (*Odocoileus virginianus)*, another member the Cervidae family, whose epiphysial fusion information is presented in Purdue (1983). White-tailed deer is a closely related species to the caribou but the timing of epiphysial fusion may not be exactly the same and therefore the use of it as a reference introduces some bias into the ageing procedure but nonetheless provides us with a better picture of caribou kill-off patterns in seventeenth-century Ferryland. Recovered elements are noted as fused or unfused and placed into a category according to the known time of fusion for that element (i.e., 6-10 months, 12-24 months, etc...). Fused elements provide a minimum age at death for a species and unfused specimens provide a maximum age at death.

Storå (2000) provides information for the harp seal (*Phoca groenlandica)*. Aged seal specimens will be categorized into an appropriate age class as determined by Storå 2000 and presented in Table 5 whereby fusing elements belong to the specified age class, unfused elements can belong to any younger age class than that at which it should be in the fusing process, and fused elements belong to any age group after its fusion time.

Table 5: Fusion sequence for harp seal elements (from Storå 2000)

Age class	Skeletal age group	Skeletal element
Yearling	1	Anterior phalanges 1,2 - distal epiphyses
	2	Metacarpal I - distal epiphysis
	3	Scapula - supraglenoid tubercle
		Humerus - head and greater tubercle of proximal epiphysis
		Anterior phalanges 3
		Innominate – acetabulum
		Metatarsal I - distal epiphysis
		Posterior phalanges 1,2 - distal epiphyses
Juvenile	4	Crural bone - tibial and fibular parts of proximal epiphysis
	5	Humerus - distal epiphysis
		Radius - proximal epiphysis
		Femur - proximal epiphysis (head and greater trochanter)
		Calcaneus
		Posterior phalanges 3
		Sacrum
Young Adult	6	Humerus - proximal epiphysis (epiphysis to diaphysis)
		Ulna - olcranon (proximal)
		Anterior phalanges 1,2 - proximal epiphyses
		Femur - distal epiphysis
		Crural bone - proximal epiphysis (epiphysis to diaphysis)
Old Adult	7	Radius - distal epiphysis
		Ulna - distal epiphysis
		Metacarpal I - proximal epiphysis
		Metacarpals II to V - distal epiphysis
		Crural bone - distal epiphyses (tibia and fibula)
		Metatarsal I - proximal epiphysis
		Metatarsals II to V - distal epiphyses
		Posterior phalanges 1,2 - proximal epiphyses
	8	All epiphyses of limb bones fused

Ageing Dental Eruption Patterns

Determining the age of death based on information obtained from toothed elements (mandibles and maxillae) is a common practice in zooarchaeology and is based on the premise that the teeth for a particular species will develop and erupt following a certain known sequence at a known approximate time in an individual's life (O'Connor 2000: 83). The pattern of eruption and the ages at which certain teeth erupt are determined for each species based on studies performed on live populations (i.e., Bullock and Rackham 1982, Bull and Payne 1982, Moran and O'Connor 1994). The archaeologist assumes that those individuals recovered in the archaeological record follow the norms described in these modern studies. Of course, there is always variability between individuals and not all of them conform to the set formula. Growth patterns depend on multiple variables including genetic pools, diet, and the environment (O'Connor 2000: 84; Zeder 2002: 94). In order to address this assumption, I will be doing two things. First, I will try to only draw information from large samples of aged toothed elements and not just a few. Second, I will be using the age ranges established in many different studies performed on different modern populations. This is the same reason many studies are used to determine ages of epiphysial fusion.

Before ageing toothed elements based on the state of eruption, I must clearly define what is meant by "erupted". This is easily defined in living mammals whereby an erupted tooth is one that has clearly emerged through the gum line and is visible to the naked eye. Identifying an erupted tooth on osteological remains is a more difficult task as there is no soft tissue present to indicate whether or not a tooth has broken past the gum line. Two different stages of eruption can be considered; the moment the tooth has erupted out of the alveolar bone, clearly visible in the osteological record but not among living species, and the moment the tooth has erupted through the gum line (O'Connor 2000: 83). Therefore, following O'Connor (2002), I will be defining teeth as either being in the process of eruption or completely erupted once the occlusal surface has reached the same height as neighbouring fully erupted teeth.

The sources used for ageing tooth eruption patterns are all summarized in Amorosi (1989). For *Bos taurus* (domestic cow) eruption patterns, I looked at Schmid (1972) and Silver

(1969) and Miller & Robertson (1947). For the eruption patterns of Caprines, I looked at the summary of Ovis (sheep) in Schmid (1972) and Silver (1969). I used the same two sources to investigate the eruption patterns of *Sus scrofa* (domestic pig) as well as Reiland (1978) and Sisson & Grossman (1966). *Rangifer tarandus* (caribou) dental eruptions patterns were followed using Parker (1972).

Dental Attrition Analysis

Estimating age at death based on the eruption pattern of deciduous and permanent teeth provides us with useful and relatively precise age categories up until the age at which all permanent teeth are erupted, usually once the individual has become a full adult. However, individuals can live for quite a long time afterwards, and so identifying a precise age at death for older animals becomes a challenging task. Measuring the level and development of dental attrition is a common practice used to determine the age at death of older individuals.

There are two popular systems used to record attrition patterns; one developed by Grant (1982) determines the relative stages of tooth wear, and one developed by Payne (1973) and later refined by him and others (Deniz and Payne 1982; Payne 1987; Zeder 1991). The system proposed by Payne assigns an age category to the different stages of tooth wear whereas Grant's system is only used to describe mandibular tooth wear in one specimen relative to another. Both approaches are similar in that tooth wear categories are determined based on published diagrams of tooth wear, related to the level of dentine exposure as the tooth enamel gets worn away. Both systems are based on mandibular teeth only. However, that is where most of the similarities end. Payne's system records the level of attrition for individual teeth within mandibles or mandible fragments. The combination of tooth wear levels represented by each tooth within a mandible are added together, assigning that mandible to a particular wear stage which is in turn associated with a suggested age grouping (Payne 1973). The Grant (1982) system requires analysts to fit their mandible specimens with published diagrams that represent the different stages of attrition for the entire mandible from the fourth pre-molar to the third molar instead of looking at individual teeth. Grant has produced diagrams for cattle, caprines and pigs.

There are supporters and critics of both systems. Zeder (2002: 95) believes Payne's system to be more "robust and reliable". O'Connor (2000: 88) believes that Grant's system is straight forward, better defined and that results can be easily and reliably replicated by anyone. However, he does have critiques of the subsequent analytical steps whereby each permanent molar is assigned a tooth wear stage (TWS). The TWS given to each tooth are added together to give a mandibular wear stage (MWS) which is used to place the different mandibles in a relative order suggesting that those with higher MWS values are the oldest. It is suggested by Grant (1982) that mandibles with a few missing teeth can be assigned likely TWS values based on the TWS values of the present teeth. As O'Connor (2000: 88) points out: "this introduces an element of approximation to a procedure which is otherwise systematic and apparently objective". Of course the entire purpose of dental attrition analysis is to obtain an age value for the mandibles, perhaps in this respect, the Payne system is more successful. However, other factors do come into play.

Dental attrition is caused by a variety of factors and the type of food being consumed is often considered the primary reason for enamel wear (Reitz and Wing 1999). However, other studies indicate that tooth wear tends to occur primarily as a result of ingesting soil and not on the type of plant being consumed (Zeder 2002: 94; Moran & O'Connor 1994: 270). These studies also suggest dental wear is more likely to occur in the winter and spring unless a softer winter feed is provided which will reduce the level of attrition (Healy and Ludwig 1965, in O'Connor 2000). No matter which of these two reasons is the most important factor behind tooth wear, an important assumption is being made that past populations had the same feeding/grazing patterns and were subject to the same husbandry practice as the modern populations on which these studies are based. It should be noted that tooth attrition analyses are better suited for high crowned ruminants like caprines and cattle, which eat large amounts of feed and graze at a somewhat constant rate. Therefore the teeth are worn down at a regular speed throughout the lifecycle and the tooth height allows them to last longer before being reduced to the roots. Animals such as pigs do not exhibit this regularity in feeding and do not have high crowns (O'Connor 2000: 87).

Having examined the literature regarding tooth wear analysis, I decided to apply the systematic and easily reproducible system put forward by Grant (1982). The primary reason for deciding on this system is consistency. Not only is this system said to be the most objective when it comes to data collection, but it is also the system applied by Hodgetts (2006, 2009) toward her analysis of Ferryland's faunal remains. Given the irregular nature of pig tooth attrition patterns, I will only be identifying the mandibular tooth wear stages for caprines, cattle and caribou with reference to the published diagrams in Grant (1982) for the caprines and cattle and Parker (1972) for the caribou. I also chose Grant's system because it does not associate ages to the specimens. As previously discussed, a multitude of factors can define the rate of attrition development among mammals. With this comes the assumption that archaeological populations were exposed to similar conditions undergone by modern populations from which the data is derived. Therefore, age at death comparisons between sites are incompatible if animals are raised differently and the assigning of ages to tooth wear stages appears arbitrary. Grant's system presents data in a way where I only compare Ferryland material with Ferryland material in a relative fashion. Therefore I can still compare ageing information from one area of the site to ageing information from another area and answer questions regarding the differences between the Mansion House assemblage and other areas of the site using MWS values. Tooth attrition analysis only looks at complete or almost complete mandibles which can drastically reduce sample sizes. In order to judge if many mandibles were lost to fragmentation and taphonomic processes, I will look at whether or not there are high numbers of loose mandibular teeth found in the assemblage (Maltby 1982).

5.1.2 Sexing

Sexing techniques in zooarchaeology are not as widely researched or as prominent in the published literature. Perhaps this is a reflection of one of the main problems with attributing a specimen's sex in the archaeological record. Aside from the application of statistical procedures to a series of metric measurements, sex is usually determined by the presence of morphological features or elements only attributable to one sex (i.e. antlers in male deer or the presence of a baculum). Not finding these elements or features does not necessarily indicate the absence of males from the faunal assemblage or that there are fewer males than females. The elements indicative of the male sex are equally subject to the taphonomic processes that affect the rest of the sample. The fact that there are very few elements indicative of a sex, in some cases only the male's baculum, suggests the chances of finding these are minimal. In the case of Ferryland and this study, I will only be identifying sex through the presence of identified bacula in the case of male mammals and through the identification of medullary bone in the case of birds, a secretion found in the medullary cavity of female birds at the time of egg production (Gilbert, et al. 1996: 11). Again, the absence of medullary bone does not indicate an absence of females from the faunal collection. Caribou antler will not be used as an indicator of sex as both males and females carry them (Madsen n. d.: 5) as is the case for horns in certain breeds of cattle, sheep and goats (Asdell 1944; Ndumu, et al. 2008; Zohary, et al. 1998: 130).

5.1.3 Taphonomic Identification

Originally developed in Palaeo-ecological research, taphonomic studies investigate the processes of deposition and burial of archaeological materials (Denys 2002: 469). Various depositional processes leave their unique mark on artefacts and ecofacts and the identification of these processes can reveal information related to the behaviour of the population that created the deposit or information as to any form of post-depositional disturbances (Denys 2002; Landon 2005). In other words, although taphonomic processes alter the conditions of recovered materials or whether they are recovered at all, the proper interpretation of these processes allows the archaeologist to better understand which part of the larger picture he/she is looking at. There are seven different categories of taphonomic processes all of which will be considered in this project. These are named biotic, thenatic, perthotaxic, taphic, anataxic, sullegic and trephic processes (Micozzi 1991:5).

Biotic processes are those which act upon the life assemblage, the living community of animals present on or around the site before deposition. There are many possible causes, both natural and human, for certain animal populations to be present in one area at a given point in time, such as a change in the landscape providing a new habitat for some species and destroying another habitat for others, the human introduction and breeding of domestic animals for a specific activity, the development of agriculture and the introduction of new flora attracting wild fauna, etc... (Micozzi 1991: 5). These processes can be investigated by looking at which animal species made their way into the deposits and which ones did not. It is important to understand that the presence or absence of a particular species within a deposit is not necessarily only a result of biotic processes but is largely a factor of human selection.

Thenatic processes are the events that actually bring about the death of the animal. The cause of death can occasionally, but not always, be seen in the archaeological record such as a bullet wound. Perthotaxic processes are the events which act upon the dead animal before its incorporation into a deposit. Dispersal of the skeleton represents a form of perthotaxic process and can be caused by different events. Should human activity be the cause of the dispersal of the skeleton, evidence of disarticulation using cutting tools will often appear on the bones as cut marks. All faunal remains were analyzed for the presence of cut marks. If a cut mark was present, its location on the bone was noted as was the type of cutting. The distinction is made between three different types of cutting methods; chopping, cutting and sawing. Chop marks are largely the result of bone repeatedly being hit with a sharp object such as an axe. They are usually blunt, "v" shaped, and will often show unsuccessful chop areas where the tool hit off the mark. A cut mark is the result of bone coming into contact with a sharp smooth surface such as a knife and a saw mark is the result of the bone being sawed through with a serrated blade. Dispersal activities can also be caused by other animals such as scavengers eating the flesh or rodents gnawing on the bone. The presence of tooth marks left behind by carnivores and rodents will be noted for each specimen in order to assess the extent to which these animals had an effect on the assemblage. Another cause for the dispersal of a skeleton is by the natural environment such as wind, rain and streams transporting materials. Both fluvial and aerial effects can be identified on the bone, and the extent to which specimens have been weathered was noted. Burning of the bone is a common thenatic process whereby the bone is burnt as it is exposed to fire before being deposited.

Taphic processes are results of the deposition process such as discolouration of the bone from the soil matrix it was deposited in or fossilization of the material. This information not only tells us that the bone was buried but also informs us as to whether other taphonomic processes occurred on the bone before or after that deposition. Anataxic processes are those events that act upon the bone if it has been re-exposed to the surface, this can include further weathering or dispersal or breakage caused by external pressures such as trampling. Sullegic processes inflict damage to the material as a result of the archaeological excavations themselves, such as breaks or cut marks introduced onto the bone from excavation tools such as trowels and shovels. Trephic processes are a result of the curation process.

5.2 Quantification

Faunal studies are often blessed with having large databases from which to draw one's conclusions. Presenting such a large amount of data in a succinct and appropriate manner requires the use of quantification techniques that both summarize the data and provide answers to the research questions directed at it. Zooarchaeological research has long made use of quantification techniques and many different methods have come about over the years to answer research questions. There exists an equal amount of literature put forth over the same period criticizing these techniques, suggesting improvements, and emphasizing the proper application of statistical procedures. Some of these techniques have been applied to this project. The purpose they serve towards answering the research questions set out in the introduction and the methodologies put forth to realize their application are discussed here.

5.2.1 Number of Identified Specimens (NISP)

Calculating the number of identified specimens (NISP) is one of the simplest and most common quantification methods employed in zooarchaeology (Ringrose 1993:125). There are many definitions for NISP in the published literature but they all basically say the same thing (Lyman 1994:44). Simply put, NISP is the count of the number of specimens identified to a taxonomic group within an assemblage. This quantification technique is also the most extensively reviewed and has its fair share of both supporters and detractors (Reitz and Wing 1999: 156). Despite the fact that NISP is a simple tally of identifications, there are still many decisions involved in calculating it that can affect the data (Ringrose 1993). An example of one of the most common decisions which can greatly influence final results occurs when different faunal specimens cross-mend. The question then becomes if these fragments should be counted as one specimen because they belong to the same bone or whether they should be counted separately (Reitz and Wing 1999:191). All of the decisions involved in the procedures leading to the calculation of NISP have made this quantification technique subject to much criticism.

One of the main criticisms surrounding NISP is its vulnerability to fragmentation within an assemblage. NISP basically treats each identified fragment as a separate individual and therefore the more fragmented an assemblage, the greater the chance that the same bone from the same animal is counted more than once. This could lead to over-representation of a species in the faunal record (O'Connor 2000:56; Ringrose 1993:126). Marshall and Pilgram (1991) note the validity of NISP (i.e., the accuracy to which it records what it says it records) decreases where there is an increase in the level of fragmentation.

Other criticisms surrounding NISP are based on the identifiability of bones. First of all some animal species have more recognizable elements than others which may lead to more of these being identified by the archaeologist (Ringrose 1993:125). A good example given by O'Connor (2000:56) discusses how pigs have more teeth and toes than bovids and these small bones are very resistant to taphonomic processes. Therefore they are easily identifiable and may lead to an over-representation of pig relative to cattle in the NISP. This bias becomes especially evident when comparing NISP values between very different taxonomic cases like mammals (who average around 200 bones) and fish (who can have over 500) (Ibid., 56). Another argument relating to the identification process revolves around the idea that NISP values will be greater for those animals that either died on site or were brought whole onto the site. That being the case, NISP is not taking into account events like offsite butchering which would could have significant meaning for archaeological interpretations (Ringrose 1993:125).

Despite all these negative comments surrounding the application of NISP, there are still some benefits to applying this technique. At the very least, NISP can serve as a basic ranking of taxa identified on a site and an excellent starting point for further quantification (O'Connor 2000; Reitz and Wing 1999). Such relative frequencies can be used towards different research questions such as the identification of different activity areas and the importance of different species within subsistence strategies (Reitz and Wing 1999:191). NISP values are easy to calculate and therefore commonly found in many zooarchaeological reports. NISP is also an additive process meaning later studies carried out on the same site can simply add new NISP values to previously calculated NISP values without affecting the integrity of the data (Ringrose 1993). Being a relative frequency count, NISP can be compared between different sites that share depositional characteristics (i.e. deposited by the same group or culture) and where the fragmentation and recovery rates are similar (Reitz and Wing 1999:91).

NISP continues to be applied in faunal studies today and as Gauthier (1984) suggests, fragmentary counts do seem to work and the validity of NISP's application depends entirely on the researcher's objectives. After reviewing all of the problems and benefits associated with NISP it is important to recognize the need to clearly define one's research question before proceeding with a quantification technique and to properly present how information was collected (Reitz and Wing 1999: 201).

In the context of this study, NISP is used to provide a basic tally of the identified taxa for each event from the Mansion House assemblage. The NISP values are used, along with other quantification techniques, to rank the relative importance between different species. Fragments that cross-mend are considered to be one single specimen. Therefore the specimen count and not the fragment count is used to calculate NISP. The application of NISP follows suit with the quantification techniques applied by Hodgetts (2006). Hodgetts (2006) looked at one event that belongs to the Mansion House assemblage, and although I will mostly be analyzing the various Mansion House deposits separately, the additive nature of NISP allows for a combination of her values with mine.

5.2.2 Minimum Number of Individuals (MNI)

The minimum number of individuals (MNI) is a quantitative measure that was first applied in palaeontology, with much success, and later adapted to zooarchaeology, receiving much criticism (Reitz and Wing 1999:195). In some arguments, the application of this method seems to be completely justified while others believe it to be a complete waste of time and effort (Ringrose 1993). O'Connor (2000:59) states it perfectly when he says: "If all the papers which have been written on this topic were to be laid end to end they would cover a very great distance, without reaching a conclusion." Nevertheless, MNI continues to be applied to zooarchaeological investigations to this day (e.g., Milne and Crabtree 2001) and shall be applied in this study and critically examined here.

Shotwell's (1955) definition for MNI is one of the most popular in zooarchaeological papers (Reitz and Wing 1999:194). He defines it simply as the smallest number of individuals necessary to account for all of the deposited specimens recovered on the site. In other words, it represents an attempt by archaeologists to provide the minimum number of dead animals necessary to account for the collection being studied. For example, if three full skulls are recovered, then at least three animals must have died (Ringrose 1993:126). Unfortunately the methodology involved in the determination of MNI is not as simple as this definition.

All of the methods for the determination of MNI are based on the idea that vertebrates are composed of identifiable and symmetrical elements. These elements are either midline or paired (right and left) (Reitz and Wing 1999:195). After the identification process is complete, the most common element identified for a taxonomic group is examined in order to determine the MNI. The three most popular ways of counting MNI are based on the abundance of the most common paired elements, the abundance of the most common paired elements considering age and sex of the specimens, or the matching of elements. The first method pairs together left and right elements in order to determine the MNI (e.g., three right tibiae + four left tibiae = MNI of four). The second method is done the same way except it takes into account the age and sex assigned to each element. Therefore if one of the right tibiae in the previous example represents a juvenile specimen and all of the others represent adult specimens, then the MNI would be five individuals. The third method, matching, is the most time consuming but also the most accurate (Ringrose 1993). Here all of the elements are set out on a surface and matched together using age, sex, size and other criteria to determine the most correct pairing of elements possible.

Unlike NISP, MNI is not affected by high levels of fragmentation because MNI is designed not to account for the same bone twice (Ringrose 1993:127). MNI represents a better way of comparing frequencies between those very different taxa such as fish and mammals. According to Reitz and Wing (1999:199) it is the only way to compare between different classes in an assemblage.

Like NISP, MNI is closely related to the size of the sample (Grayson 1981). However, MNI also has many more issues surrounding its application to zooarchaeological data. One of the main issues is that MNI numbers are not additive (Ringrose 1993:128). One cannot calculate the MNI of an assemblage one year, go out to the field the next year, excavate more remains, find the MNI values of this new assemblage and then add these to the old values. The only proper way would be to go back and pull out all of the old specimens and recalculate the MNI numbers incorporating the new assemblage. One must also be careful not to calculate the MNI from different cultural or temporal stratigraphic levels between sites (Reitz and Wing 1999:197). MNI is useful for determining the relative importance of different taxa within an assemblage and should not be used as a basis for comparison between collections.

MNI also tends to overestimate the importance of rare taxa (Ibid., 198). For example, cattle can dominate an assemblage with an NISP of over 500 bones but circumstances have only allowed for an MNI of six to be calculated. Two raccoon specimens have been identified automatically giving it an MNI of one. Does this mean that the ratio of cattle to raccoon is six to one? Probably not. Another major issue with the application of MNI is that it assumes the presence of the entire animal on the site and does not account for issues such as transportation of selected animal parts or the redistribution of food (Ibid., 197).

Like almost all other quantification techniques, there have been many different ways in which archaeologists have and continue to define and calculate MNI (Lyman 1994). When reading the literature, it is important to keep in mind the methods being followed and how this affects the data being produced. MNI has too often been employed towards research questions where figuring out the minimum number of individuals is not the proper research tool (Reitz and Wing 1999:199). In the context of this study, MNI will be considered alongside with NISP values to rank the importance of different taxa found at the site. MNI will be most useful to better understand the importance of species found in greater abundance at the site and concurrently looking at the NISP values will help judge as to whether or not the MNI values are inflated (i.e. to make sure one species is not over-represented, as would be the case if all 200+ bones of one individual were found giving an inflated NISP value). In this project, MNI is calculated using the matching of elements technique whereby all elements identified for a single species are laid out on the table; taking into account the most numerous elements, age and size to determine how many individuals are present. MNI values are calculated for each event separately. This assumes that animals remains were not separated and deposited in more than one event. The different occupation periods attributed to some of these deposits and the locations of others justify this approach, although it is quite possible that some of these events are related and include remains from the same individual thus possibly introducing some bias into the quantification. Hodgetts (2006) presented MNI values alongside her NISP data. This project will do the same for the sake of consistency and because of the added value MNI has in allowing the reader to evaluate the importance of the roles various species played in the deposits.

5.2.3 Minimum Number of Elements (MNE) and Body Portion Representation

With NISP failing to account for fragmentation and MNI failing to address questions other than the relative number of each species present, the minimum number of elements (MNE) allows archaeologists to ask new questions related to the interpretation of the faunal material. Unlike MNI, MNE treats each element separately and calculates the fewest number of elements possible within the assemblage for a single taxonomic group based on overlapping landmark features (Reitz and Wing 1999:215). Therefore, unlike NISP and MNI which investigate the relative importance of different species within an assemblage, MNE looks at the body part representation for a single species. This method assumes that people in the past may have been breaking things up and allows archaeologists to investigate if and how animal carcasses were being separated. Therefore MNE provides an advantage over NISP by accounting for fragmentation in the faunal record and by minimizing the chance of having the same bone counted twice (Ringrose 1993:130). MNE also provides an advantage over MNI because it accounts for transportation issues such as the possibility of offsite butchering and processing of the animal (Ibid., 135).

The best and most accurate way to determine the MNE values within an assemblage associated to one specific taxonomic group is to remove all of the specimens identified to one element and lay them out in front of you. Taking into account the end (proximal vs. distal) and portion of the bone present (e.g., 70 percent of the element) for each specimen, one can calculate the minimum number of elements present within a collection by adding together all of the identified proportions and rounding up to the nearest number. For example, if an assemblage has a specimen representing 70 percent (0.7) of one distal tibia and another full tibia (100 percent), the MNE is two tibiae (1+0.7= 1.7= 2). This method does not take into account age, sex, size or side of the specimens. The side of the element can and should be taken into account in order to better reflect the true minimum number of elements (e.g., three left distal tibiae + two left proximal tibiae + one right proximal tibia = MNE of four tibiae).

While compiling a review of quantification units in zooarchaeology, Lyman (1994) found that there were over thirteen different definitions for MNE and at least six different, yet similar, ways of calculating it. Some zooarchaeologists even continued to call it MNI in the Binford (1978) sense, even though they were clearly calculating the minimum number of elements (Reitz and Wing 1999: 215). Evidently, there is a lack of a consensus among researchers as to how MNE should properly be defined and obtained. It should be made clear in the published literature how calculations are set out including what exactly is being counted and a statement on why specimens are being counted the way they are (Lyman 1994: 54).

According to Grayson (1984) MNE is susceptible to many of the same aggregation issues as MNI. Lyman (1994: 52) also shares this point of view describing how age, sex, size and taphonomic differences between specimens may or may not be taken into account rendering MNE a more subjective analytical unit rather than an observational one. Again, this highlights the need for zooarchaeologists to clearly define their methodology. Although Ringrose (1993: 130) does not believe this to be as big an issue as Grayson and Lyman might think.

This project only calculates the MNE for cattle (*Bos taurus*), pig (*Sus scrofa*), caprines, and caribou (*Rangifer tarandus*). Whenever a specimen was identified as belonging to one of these species, the portion present was sketched onto an outline of the element it represents. These sketches, along with information on portions present, age and side of the specimen were used to determine the MNE values.

The calculation of MNE values allow for the calculation of body portion representation, an idea that first became popular with Binford (1977) when he applied an investigation of minimum animal units (MAU) to further study the idea that people dismember and transport certain animal body portions (Lyman 1994: 55). The application of MAU and further analytical methods derived from it can tell you if certain body portions of a particular taxon are significantly over/under represented. To calculate MAU, one needs to first calculate the MNE values for each element in a taxon's assemblage. Like MNE, the MAU is calculated for each separate element. The first step is to select an element for which you wish to calculate the MAU and determine how many times this element naturally occurs in the body of the animal (e.g., a femur occurs twice). You then simply divide the MNE by this number to obtain your MAU value (Ringrose 1993: 130). All values of MAU for each element or body portion are added to provide a total MAU. The %MAU score for each element /body portion can be obtained from that value.

In order to investigate body portion representation, I decided to follow Jamieson's (2008) adaptation of Stiner's (1994: 242) division of body parts into nine different categories. The only modification I made is that, like Bowen and Trevarthen Andrews (2000), I included the bones of the innominate as part of the upper hind quarter rather than as part of the axial skeleton. Table 6 displays the different body portions and the elements associated with these. Calculating the MAU is one of the most popular methods zooarchaeologists use to standardize the observed frequencies of animal body part representation and a good starting point from which to start drawing conclusions on estimates of dietary contributions, meat procurement strategies or from which to perform other quantitative studies such as meat weight analyses (Reitz and Wing 1999:216). The calculation of MAU is subject to the same criticisms that plague the MNE calculations from which it is derived, mainly that it doesn't take into account age, sex and size of the specimens (Klein and Cruz-Uribe 1984). Derived quantitative calculations like MNE and MAU work best when applied to large sample sizes. Unfortunately the sample sizes of the Ferryland collections are not so large and therefore results obtained from the application of these procedures can only hint at what might be happening at the site and should be carefully examined keeping all other evidence in mind.

Table 6: Body portion division and associated skeletal elements

Antlers/Horns	Antlers (or horns)	**Lower front quarter**	Ulnae Radii Carpals Metacarpals
Head	Cranial bones Mandibles		
Neck	Cervical vertebrae	**Upper hind quarter**	Bones of the innominate Femora
Axial	Thoracic vertebrae Lumbar vertebrae Sacral vertebrae Caudal vertebrae Ribs	**Lower hind quarter**	Tibiae Fibulae Tarsals Metatarsals
Upper front quarter	Scapulae Humeri	**Feet**	Phalanges

Chapter 6: Results of Faunal Analysis

6.1 Specimen Identification

Over 8,846 faunal remains were recovered from the various deposits associated with the Mansion House. These include 8,350 pieces analyzed by the author and another 496 fragments recovered from the front door midden deposit identified and described in Hodgetts (2006, 2009). After matching and mending together all of the fragments that clearly belonged together, a total of 8,644 individual specimens were recorded. Of this number, 36.6 percent (3,161 specimens) were identified to the level of taxonomic family or lower.

Table 7: Distribution of faunal specimens and the rate of identification per event

Event	# Recovered Specimens	% Identified to Taxonomic Family or Lower
613	1320	35.8
626	102	70.6
627	720	39.9
630/631	87	34.5
632	356	40.4
633	69	40.6
634	4908	34.0
636	12	50.0
651	376	45.2
652	111	34.2
665	3	66.7
678	16	12.5
696*	3	0.0
713	54	37.0

*null value of %NISP a result of rounding

Table 7 presents the distribution of faunal specimens throughout the various deposits that make up the Mansion House assemblage and lists the percentage of specimens identified to the level of taxonomic family or lower for each event. Five of these events (Events 613, 627, 632, 634 and 651) stand out above the rest as they contained the largest number of faunal specimens. The large sizes of these deposits provide a larger and therefore more statistically significant sample that is better representative of the materials originally deposited. These five events will be much of the focus of later analyses and will often be compared to each other in order to determine if the various deposits that supposedly make up the Mansion House assemblage share anything in common. The data obtained from the analysis of the other, smaller events will not be ignored as all of the Mansion House's deposits will be combined together whenever I need to compare the Mansion House assemblage to other areas of the site. Events 636, 665, 678, 696 and to a lesser degree, Event 713, have such small samples that it is difficult to say anything about these events on their own except that they contained few faunal remains.

6.2 Class Distribution

Table 8: Class Distribution for Mansion House assemblage including data from Hodgetts (2006, 2009).

Taxonomic Class	NISP	%NISP
Gastropoda*	2	0.0
Bivalvia	15	0.2
Osteichthyes	3509	40.6
Aves	1183	13.7
Mammalia	3812	44.1
Indeterminate	123	1.4
Total	**8644**	**100**

*null value of %NISP a result of rounding

Table 8 presents the distribution of taxonomic classes identified from all of the deposits that make up the Mansion House assemblage, including the identifications made from the front door midden deposit of the Mansion House by Lisa Hodgetts (2006, 2009). A total of five different taxonomic classes were identified and 1.4 percent of the assemblage was unidentifiable to this point. A negligible presence of only two gastropod specimens was recovered. These could not be further identified to species because of the lack of a reference collection although it is likely they are snails naturally present in the soil matrix and intrusive specimens to the Mansion House assemblage. The remains of crustacean exoskeletons are completely absent from the assemblage and very few bivalve shells were recovered and their importance pales in comparison with the bony fish, avian, and mammalian remains which dominate the assemblage.

6.2.1 Fish, Bird and Mammal Distribution

Bony fish, avian and mammalian bones are the most common types of faunal remains found in the Mansion House assemblage comprising over 98.3 percent of all animal bones. Figure 6 shows that within the Mansion House assemblage, there is a slight variation as to the abundance of each taxonomic group between some of the deposits. Mammalian remains are the most abundant in all deposits ranging from 42 to 52 percent, except for in Event 634 where fish remains form over 53 percent of the assemblage and mammalian remains only account for 31 percent of the assemblage. Bird remains represent the third most common taxonomic group in all assemblages ranging from 11 to 26 percent.

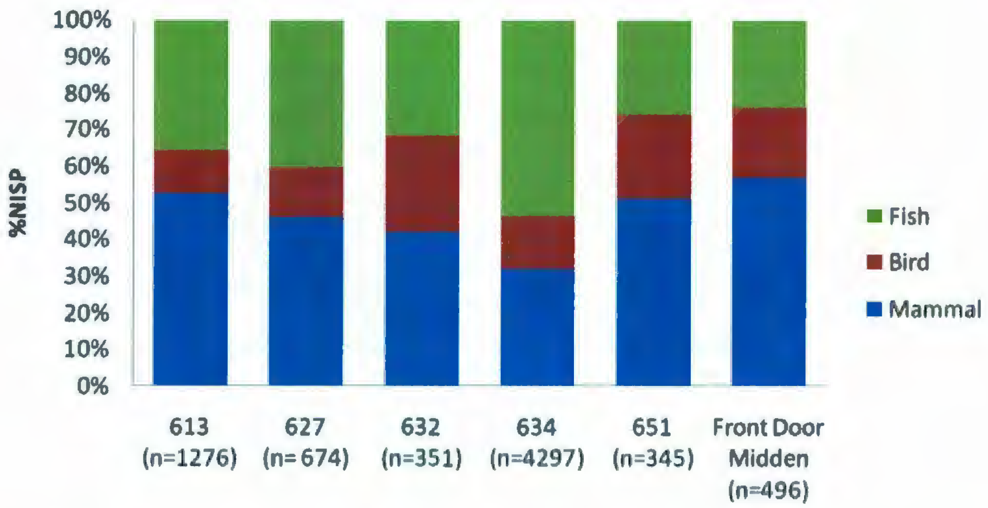

Figure 6: %NISP distribution of fish, bird and mammalian remains for the six largest events associated with the Mansion House. Front door midden data from Hodgetts (2006).

6.3 Identified Taxa

Table 9 presents the number of identified specimens (NISP) and the minimum number of individuals (MNI) for the five largest deposits of the Mansion House assemblage which provides a good account of the range of species found in the Mansion House and their overall importance in the overall assemblage. The complete NISP and MNI results for each event are presented in Appendix I. A biological and ecological summary for each animal species recovered at the site is included in Appendix II. Appendix III is a visual representation of pig, caribou, cow and caprine specimens recovered from the five largest deposits of the Mansion House.

6.3.1 Fish

The majority of fish taxa identified at the site are members of the cod family (Gadidae sp.). Included in this group are the Atlantic cod (*Gadus morhua*), the arctic cod (*Boreogadus saida*), the Greenland cod (*Gadus ogac*), the haddock (*Melanogrammus aeglefinus)*, the pollock

Table 9: NISP for the five largest deposits of the Mansion House assemblage. MNI presented in brackets where appropriate.

Scientific name	Common name	Event 613	Event 627	Event 632	Event 634	Event 651
Gastropoda sp.	Gastropod sp.					1
Bivalvia sp.	Bivalve sp.		1	1	11	1
Osteichthyes sp.	Indeterminate fish	234	170	52	1509	20
Clupea harengus	Atlantic herring	2 (1)	1(1)		2(2)	3(1)
Gadidae sp.	Cod family	205	90	53	721	61
Gadus morhua	Atlantic cod	9(3)	10(2)	6(1)	66(14)	6(2)
Pleuronectidae sp.	Flat fish family				2	
Pleuronectes glacialis	Arctic flounder		2(1)			
Salmonidae sp.	Salmon and trout family		1			
Aves sp.	Indeterminate bird	25	15	50	174	20
	Large bird	1	1		4	
	Medium - large bird	41	18	7	127	19
	Medium bird	22	22	4	159	11
	Small - medium bird		1		9	
	Small bird		1	1	23	
Gavia immer	Common loon					1(1)
Gavia stellata	Red-throated loon	4(2)				
Phalacrocoracidae sp.	Cormorants				2	
Anatidae sp.	Ducks and geese family		1	1	3	1
Anserinae sp.	Geese sub-family	1			1	2
Anser anser	Domestic goose	3(1)				
Anatinae sp.	Ducks sub-family	10	4	1	32	5
Anas rubripes	American black duck	1(1)				
Anas acuta	Northern pintail duck	1(1)				
Clangula hyemalis	Long-tailed duck	3(1)	1(1)			
Somateria sp.	Eiders	2	1		1	
Somateria mollissima	Common eider	4(2)	3(1)	1(1)	6(2)	1(1)
Somateria spectabilis	King eider				1(1)	
Melanitta deglandi	White-winged scoter		1(1)			
Galliformes sp.	Pheasants order				4	
Lagopus sp.	Ptarmigans				2	1
Lagopus lagopus	Willow ptarmigan	6(2)	3(1)	1(1)	20(5)	2(1)
Meleagris gallopavo	Turkey		1(1)			
Gallus gallus	Domestic chicken	1(1)	2(1)		7(2)	1(1)
Scolopacidae sp.	Woodcocks and sandpipers family	1			3	
Actitis macularia	Spotted Sandpiper		1(1)		1(1)	1(1)
Larinae sp.	Gulls and terns	2	3	3	5	1
Larus sp.	*Larus* genus	1	1	1	2	1
Larus hyperboreus	Glaucous gull					1(1)
Larus marinus	Great black-backed gull	6(1)	3(1)		6(1)	5(1)
Larus argentatus	Herring gull	4(1)	1(1)		9(2)	1(1)
Larus delawarensis	Ring-billed gull	1(1)	2(1)		1(1)	
Rissa tricactyla	Black-legged kittiwake				1(1)	2(1)
Sterna paradisaea	Arctic tern	1(1)				
Alcidae sp.	Auks and murres family				2	
Pinguinis impennis	Great auk	1(1)	2(1)	1(1)	1(1)	
Uria/Alca sp.	Murres and razorbills		1	15	3	
Uria aalge	Common murre	1(1)	1(1)	3(1)	1(1)	1(1)
Cephus grylle	Black guillemot				10(2)	1(1)

Scientific name	Common name	Event 613	Event 627	Event 632	Event 634	Event 651
Columbo livio	Domestic pigeon				2(1)	
Bubo scandiacus	Snowy owl				1(1)	
Bubo virginianus/ Bubo scandiacus	Great horned owl/ Snowy owl	1(1)				
Corvus corax	Common raven	1(1)	2(1)			
Mammalia sp.	Indeterminate mammal	243	118	64	237	59
	Large mammal	21	13	6	46	10
	Medium - large mammal	151	28	13	667	34
	Medium mammal	25	13	5	104	6
	Small - medium mammal	3		3	11	
	Small mammal		21		27	2
Leporidae sp.	Rabbits and hares family			1		
Muroidea sp.	Mice and rats superfamily	2	1		21	2
Rattus sp.	Rat genus		23(2)		170(10)	23(3)
Mus musculus	House mouse	1(1)			1(1)	
Castor canadensis	American beaver	1(1)	2(1)		1(1)	3(1)
Cetacea sp.	Whales and dolphins family			1		
Carnivora sp.	Carnivores order				1	
Canidae sp.	Canids		2	1	10	
Canis sp.	Wolves, coyotes and dogs		1			
Canis familiaris	Domestic dog		2(1)	1(1)	165(1)*	
Vulpes vulpes	Red fox	1(1)		1(1)	1(1)	1(1)
Felis catus	Domestic cat		18(1)			
Phocidae sp.	True seals family	7	14	3	22	4
Phoco vitulina	Harbour seal	1(1)				
Phoca groenlandica	Harp seal	1(1)	8(2)	1(1)		1(1)
Artiodactyla sp.	Even-toed ungulates order	33	8	4	36	17
Sus scrofa	Domestic pig	36(3)	32(3)	10(2)	69(3)	9(2)
Rangifer tarandus	Caribou	46(2)	20(2)	13(2)	35(3)	10(2)
Bovidae sp.	Bovids family		2		1	
Bos taurus	Domestic cow	71(1)	20(2)	17(2)	61(2)	15(1)
	Cow sized					1
Caprinae sp.	Sheep/goat sub-family	27(3)	6(2)	3(1)	219(4)*	5(2)
	Sheep/goat sized	2	1		1	
Equus caballus	Domestic Horse	1(1)		1(1)		
Indeterminate class		39	1	2	66	5

*Includes the presence of one nearly complete individual

(*Pollachius virens*) and seven different species of hake among others. The only member of this family to be identified to the species level within the Mansion House assemblage is the Atlantic cod. A total of 110 Atlantic cod specimens were identified in the Mansion House alongside 1,309 Gadidae specimens. Given that the primary economic activity at the site was the Atlantic cod fishery and that this was the only member of the Gadidae family to be identified in the entire

Ferryland assemblage, all Gadidae sp. identifications will be treated as though they represent Atlantic cod specimens in further analyses. It is possible that a few of these Gadidae sp. specimens originate from other species from the same taxonomic family but these would represent only a tiny fraction of what is an overall rather large sample and therefore should not affect the statistical outcome of the analyses. Other fish species identified in the assemblage include the Atlantic herring (*Clupea harengus*), the Arctic flounder (*Pleuronectes glacialis*) and a member of the Salmonidae family. All of these are inconsistently present in small numbers throughout the assemblage and have all been previously identified by Hodgetts (2006, 2009) in similar ratios from other deposits at Ferryland.

Dried salt cod was the primary product produced by the Ferryland fishery in the seventeenth century (Pope 2004). The only skeletal elements typically remaining in a salt cod product are the lower caudal vertebrae and the bones of the pectoral girdle which are located around the gill opening. The pectoral bones were often left behind in dried fish products in order to keep the filleted pieces together and better spread the body when laying it out to dry, whereas the head bones and upper thoracic vertebrae were discarded (McGovern, et al. 2007). Therefore, through the examination of cod skeletal element distribution in an archaeological assemblage, one should be able to tell whether or not the deposit is reflective of a salt cod assemblage (i.e., with an over-representation of elements of the pectoral girdle and caudal vertebrae), a salt cod processing site (i.e., with an over-representation of elements of the skull and pre-caudal vertebrae), or a deposit of fresh, unprocessed fish (i.e., where there is a proportionate representation of skeletal elements to what is normally found in an individual cod skeleton)(Barrett 1997; Barrett, et al. 2007; McGovern, et al. 2007; Perdikaris 1999; Perdikaris and McGovern 2006).

Following the methodology described in the previous chapter, I calculated the minimum number of elements (MNE) for all Atlantic cod and Gadidae identifications in the five largest deposits of the Mansion House. These MNE values were then used to calculate minimum animal units (MAU). The cod skeleton is separated into four anatomical units: 1. Elements of the skull, 2. Pre-caudal vertebrae, 3. Elements of the Pectoral Girdle, and, 4. Caudal vertebrae. Together, an over-representation of elements from the first two categories would be indicative of something like a cod processing site whereas a combined over-representation of elements from the latter two categories would be reflective of a dried cod assemblage. The calculation of MAU numbers were based on the standard distribution of cod skeletal elements as described by Cannon (1987) and Barrett (1997).

Figure 7 presents the distribution of minimum animal units for the cod remains from the Mansion House assemblage. The animal units are colour coded so that those in shades of red

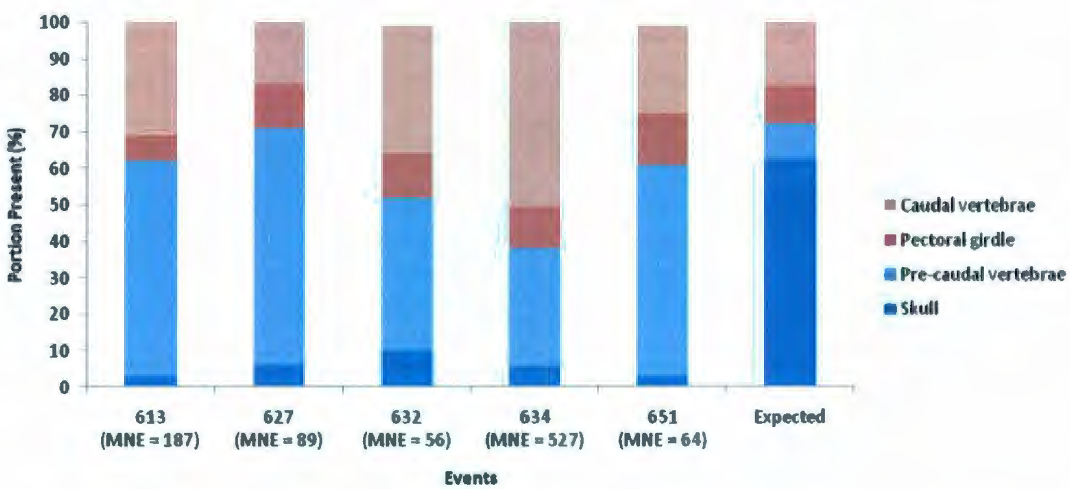

Figure 7: Cod body portion distribution. Red indicates elements associated with a salt cod assemblage. Blue indicates elements associated with a salt cod processing assemblage.

are related to elements found in salt cod and fresh fish assemblages and those in shades of blue are related to elements found in fresh fish and processing related assemblages. All elements of a cod skeleton were recovered from every deposit but not according to the expected ratio. Event 634 and, to a lesser extent, Event 632, are both the only two events to show an over-representation of salt cod associated elements, whereas Events 613, 627 and 651 seem to show proportionate numbers of blue vs. red sections. Vertebrae, whether caudal or pre-caudal, were over-represented whereas elements of the skull were noticeably under-represented (Note that Events 627, 632 and 651 have small sample sizes and should be considered with caution).

6.3.2 Birds

Over 30 different bird species were identified from the Mansion House assemblage compared to a total of 12 species identified in the whole of the rest of the site (Hodgetts 2009).

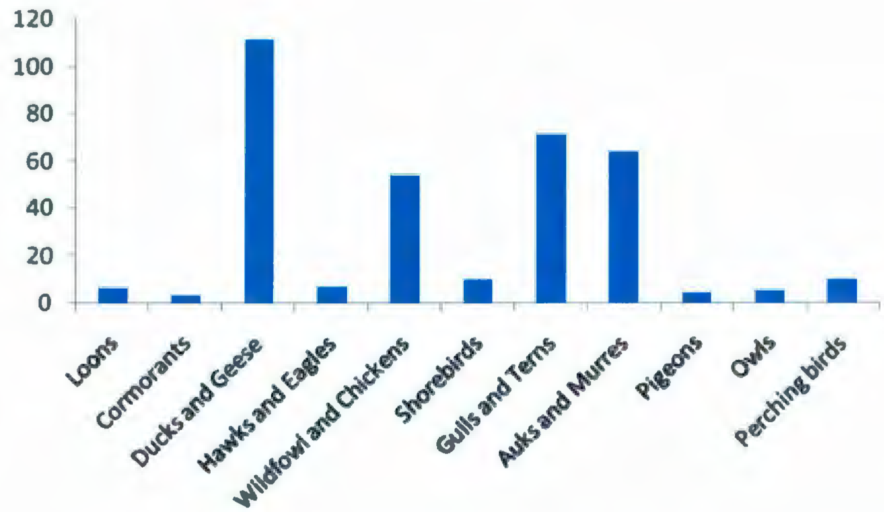

Figure 8: NISP of different bird groups identified in the Mansion House assemblage. Includes front door midden data from Hodgetts (2006).

Over 28 different bird species were identified in the Mansion House deposits representing over 11 different taxonomic families. Figure 8 presents the distribution (NISP) of the various different types of birds. The importance of ducks and geese, seagulls, auks and murres, and wildfowl is notable while the presence of other species, although often consistent throughout the different deposits, seems to be of secondary importance.

Table 10 displays the types of environments frequented by the bird species recovered from the various faunal assemblages identified at Ferryland. Bird species that uniquely frequent the interior of the island as well as domestic species are only found in the Mansion House and privy assemblages. The sample size for the Mansion House assemblage, which includes the analyses from Hodgetts (2006), is much larger than those from the three other assemblages in Ferryland, thus presenting a greater chance at uncovering species from a variety of habitats. Regardless of the assemblage, marine/coastal birds are the most prominent throughout the site.

Table 10: Habitats frequented by bird species identified in Ferryland. Values are given as %NISP of total avian assemblage. Includes data from Hodgetts (2009).

	Mansion House (n=1182)	Early Midden (n=28)	Bake/Brew House (n=30)	Kirke Midden (n=32)	Privy (n=95)
Marine/coastal species	15.6	17.8	9.5	43.7	10.5
Interior species	3.9	0	0	0	1.1
Coastal/interior species	2.2	3.5	9.5	0	3.2
Domestic species	1.8	0	0	0	9.5

6.3.3 Mammals

All of the mammalian species identified in Hodgetts (2006, 2009) from Ferryland's other assemblages were also found in the Mansion House with the exception of the American marten (*Martes americana*). Domestic mammals include the cow (*Bos taurus*), the pig *(sus scrofa)*, the horse *(Equus caballus)*, the dog (*Canis familiaris*) and the cat (*Felis catus*). The reference collection made available to the author did not allow for any distinction between goat (*Capra hircus*) and sheep (*Ovis aries*) skeletons, therefore, such specimens were only identified as members of the caprine family. The presence of goats on the site is recorded in historical documents (Cell 1982: 199) and the presence of both sheep and goat in the Ferryland faunal assemblage has been recorded by Hodgetts (2006, 2009).

Of the 13 wild land mammal species native to insular Newfoundland, only the American beaver (*Castor canadensis*), the red fox (*Vulpes vulpes*) and the caribou (*Rangifer tarandus*) were positively identified in the assemblage. One specimen is identified as a member of the rabbit and hare family (Leporidae sp.) and a few other specimens identified as part of the mice and rats superfamily (Muroidea sp.) may represent remains from native mammal species such as the arctic hare (*Lepus articus*) and meadow vole (*Microtus pennsylvanicus*) but they may equally represent European species of domestic rabbit (*Oryctolagus cuniculus*) or house mice (*Mus musculus*). A few Canis sp. identifications could not specify if the specimen represented that of a wolf (*Canis lupus*) or a domestic dog (*Canis familiaris*). Despite the lack of a wide variety of wild land mammals, caribou represents a significant portion of the number of identified specimens within the whole assemblage. The exploitation of marine mammals, particularly the harp seal (*Phoca groenlandica*) and other seals adds a significant contribution of wild mammals to the assemblage.

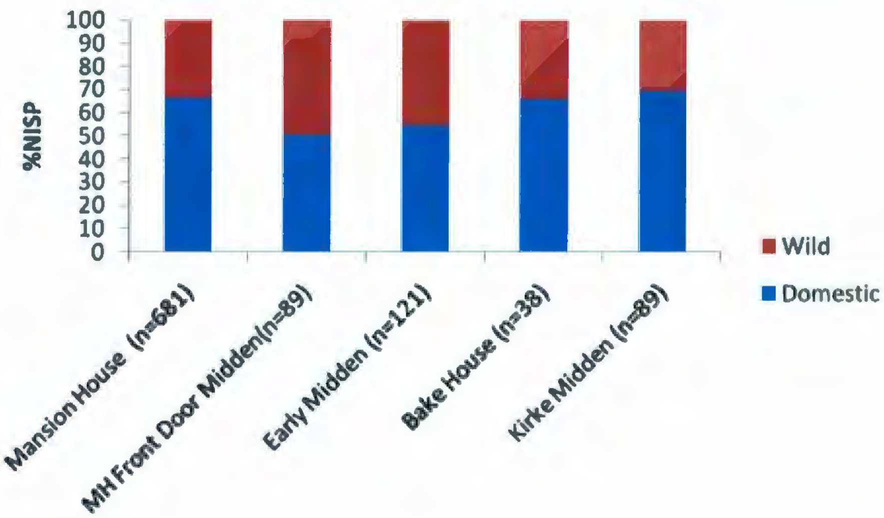

Figure 9: Distribution of Wild vs. Domestic mammals in Ferryland presented as %NISP. Includes data from Hodgetts (2006)

Figure 9 shows the distribution of wild vs. domestic mammals taken from this study and from Hodgetts (2006). The deposits seem to be quite similar in their distribution showing near equal distribution of both types of species. The Mansion House assemblage is approximately 66 percent domestic animals vs. 33 percent wild animals. The small sample sizes of the front door midden, the bake house and the Kirke midden should be considered with caution.

Of all the mammalian species present in the Mansion House assemblage, five different taxa occurred more prominently and consistently than any other species on the site, they are domestic pig (*Sus scrofa*), domestic cow (*Bos taurus*), caribou (*Rangifer tarandus*), seal, most of which is represented by harp seal (*Phoca groenlandica*), and specimens of the sheep/goat family. These are the same primary mammalian species discussed in Hodgetts (2006, 2009). Figure 10 shows the distribution of these five species throughout the principle deposits of the Mansion House.

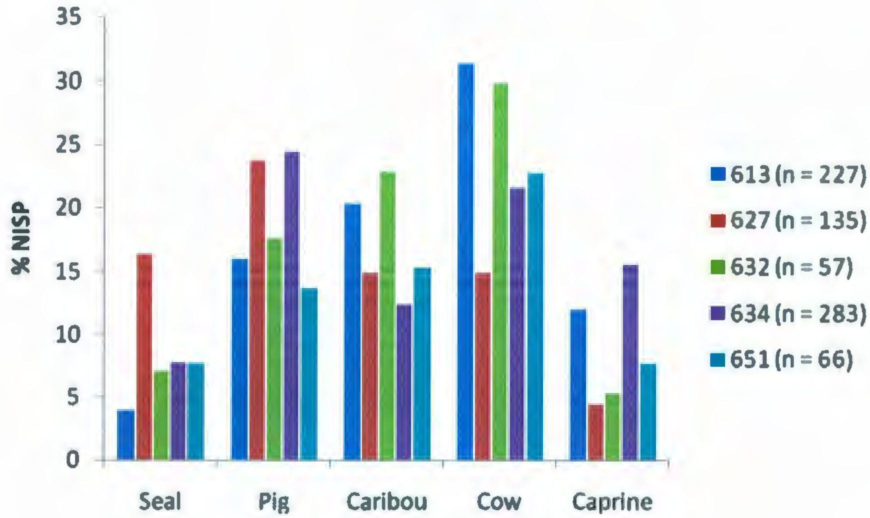

Figure 10: %NISP distribution of primary mammal species in Mansion House assemblage.

Cow is the most common of the five mammal species in all of the deposits except Events 627 and 634 where pig dominates. Pig is generally the second most dominant species except in Events 613 and 632 where caribou appears more often. The presence of caprines and seal varies throughout the deposits. Caprines are most dominant in Event 634 and 613 and seal is noticeably present in strong numbers for Event 627. Cattle are of lesser importance in Event 627 where the assemblage is dominated by pig, caribou and seal. Only two species of seal were identified in the Mansion House assemblage at Ferryland; the harp seal (*Phoca groenlandica*) and the harbour seal (*Phoca vitulina*). The majority of seal identifications could not be made to the level of species and were simply identified as belonging to the taxonomic family of "true seals" (Phocidae sp.).

There are a few intrusive and complete skeletons that were recovered from the Mansion House. Over 246 identifications were made to the Muroidea superfamily of Old and New World rats and mice, making it the most abundant mammal group in the Mansion House assemblage.

That being said, these animals are not being considered as having played a role in the diet and foodways of the site's inhabitants and are excluded from any discussion or analysis related to foodways. Two specimens are identified as part of a house mouse (*Mus musculus*) and 218 specimens are identified as members of the *Rattus* genus which includes two possible species; the black rat (*Rattus rattus*) and the Norway rat (*Rattus norvegicus*). All three of these species are native to Europe and were brought along with the settlers as stowaways in their ships and cargo. According to Webster et al. (1985), the black rat came first to North America and it wasn't until 1775 that the Norway rat was found in the American colonies. Assuming these dates can be applied to the historical rat population in Newfoundland, then it is likely that all specimens identified to the *Rattus* genus are black rats. Some Muroidea identifications may represent the meadow vole (*Microtus pensylvanicus*), the only member of that taxonomic group naturally found on the island.

A nearly complete dog skeleton was recovered from Event 634 among the collapsed rubble of Structure 18. This individual is not believed to be present as a result of the diet and foodways of the household's inhabitants and will be further discussed in the following chapter. A nearly complete skeleton of a young, 10 to 12 month old caprine, possibly a lamb, was also recovered among the rubble of Structure 18 in Event 634 at a depth slightly below that of the dog skeleton. This individual will also be further discussed in the next chapter. The NISP values from both of these individuals were removed from any quantitative summary of Event 634 as their high numbers would have unfairly elevated the importance of these taxa within the assemblage.

Specifics about the five most common mammalian taxa (seal, caribou, pig, cattle and caprines) recovered from the site will now be presented including information on body portion representation, their age profiles and butchery patterns.

6.4 Body Portion Representation

I analyzed the body portion distribution for the five most common mammal species found at the site in order to better understand: 1) if specific body portions are being selected for consumption by the Mansion House's inhabitants and 2) if different distribution patterns are present between the various deposits that make up the Mansion House assemblage, information which could help further interpret the nature of these events. As was mentioned in the previous chapter, the analysis of body portion distribution begins with the calculation of the minimum number of elements (MNE) which is then used to calculate the minimum animal units (MAU). Here I will present the %MAU distribution patterns for seal, pig, caribou, cow and caprines. Please note that some of the small sample sizes should be approached with caution.

Figure 11 displays the body portion distribution for all of the seal elements recovered from the Mansion House. The seal body is separated into six different portions; the head, the axial skeleton, the front limb, the front flipper, the hind limb and the hind flipper, as per Wells (2002). Considered separately, some of these samples are quite small but when looked at as a whole we can see that all body portions of the seal have some representation on the site and that the head, front limb and hind flipper are the most over-represented body regions. Event 627 contained more seal elements than any other deposit and most of these were part of the front limb, front flipper and hind flipper with some axial pieces. Events 632 and 634 are combined here to represent Structure 18 because Event 632 on its own was too small of a

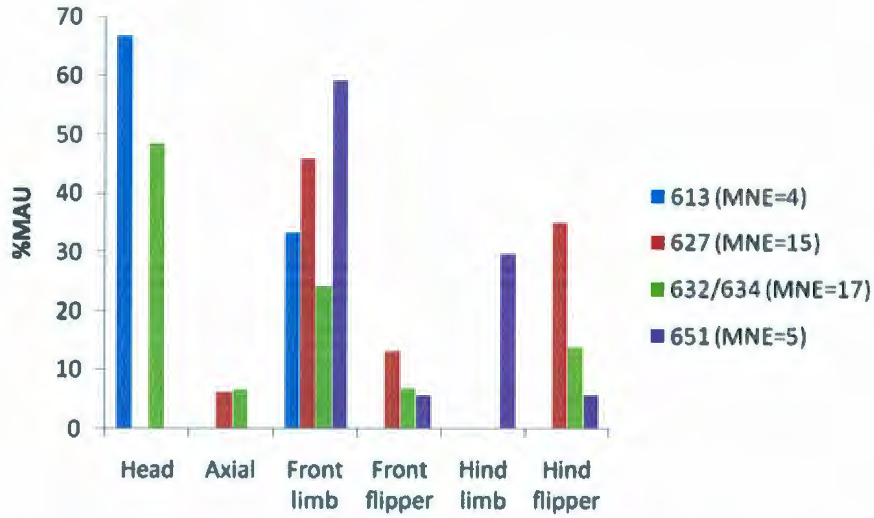

Figure 11: Seal body portion distribution in Mansion House assemblage (%MAU).

sample to even consider.

Figure 12 shows the body portion distribution of the domestic pig *(Sus scrofa)* as found in the Mansion House. Body regions for the pig and all other ungulates are separated into eight anatomical regions following Jamieson (2008) and Stiner (1994). These regions are; the horn/antler, the head, the neck, the axial skeleton, the upper fore quarter, the lower fore quarter, the upper hind quarter, the lower hind quarter and elements of the feet. Evidence from the pig's body portion distribution indicates that elements from the head are by far the most over-represented pig bones across the site except for in Event 627, the interior of the main structure, where elements from the upper fore quarter are slightly more dominant. The upper fore quarter is the second most represented region whereas all of the other body areas are somewhat equally represented. Events 632 and 634 are combined to represent Structure 18 because Event 632 on its own contains an MNE of only seven which is too small of a sample to clearly reveal any distribution pattern. Event 651 was excluded from this analysis as it contained an MNE of only four pig bones.

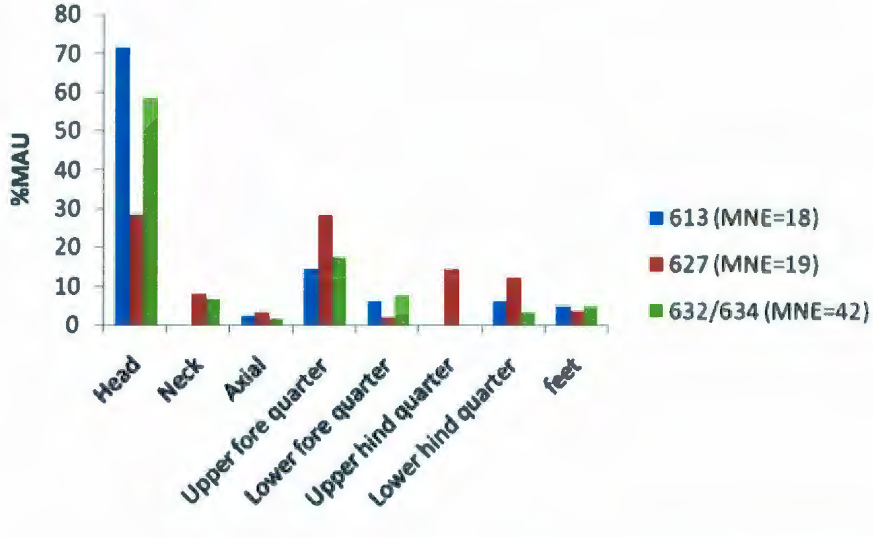

Figure 12: Domestic pig (*Sus scrofa*) body portion distribution in Mansion House assemblage (%MAU).

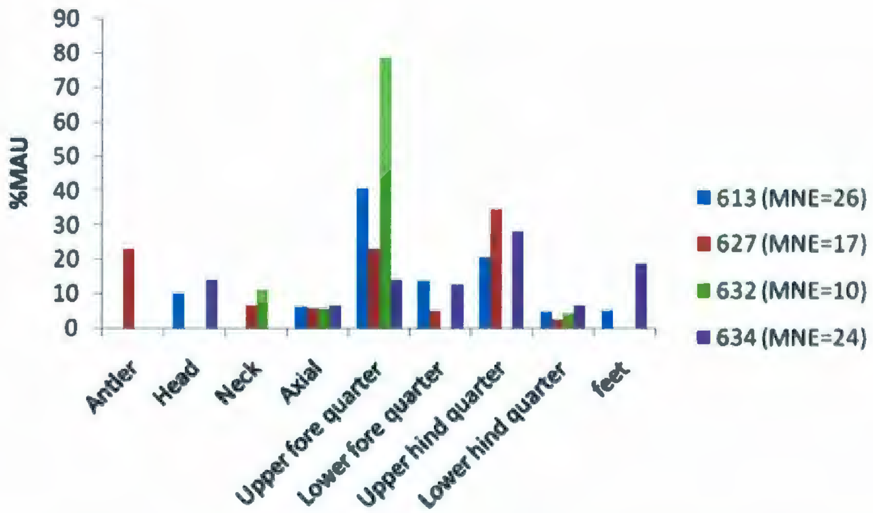

Figure 13: Caribou (*Rangifer tarandus*) body portion distribution in Mansion House assemblage (%MAU).

Figure 13 presents the body portion distribution of caribou (*Rangifer tarandus*) elements for Events 613, 627, 632 and 634. Event 651 was not included because it contained a total MNE count of only six elements. The caribou distribution is different than that from the pigs and seals. There does not seem to be an over-representation of head elements. Instead, there is more of an over-representation of meat carrying elements such as the upper fore and hind quarters. Elements of the head and feet are only found in Events 613 and 634.

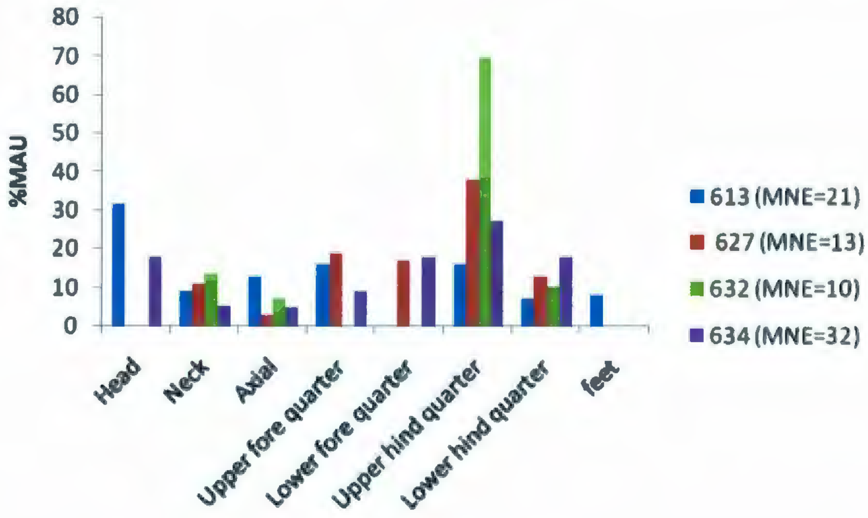

Figure 14: Domestic cow (*Bos taurus*) body portion distribution in Mansion House assemblage (%MAU).

Figure 14 displays the body portion distribution for cattle (*Bos* taurus) in the Mansion House assemblage. All body areas are present within the assemblage, however, as was the case for the caribou assemblage, the cow shows an over-representation of meat bearing elements rather than areas of the head and feet. Elements of the upper hind quarter are the most abundant equally followed by the upper and lower fore-quarters and the lower hind-quarters. Events 613 and 634 are the only deposits in which elements of the head and feet were identified.

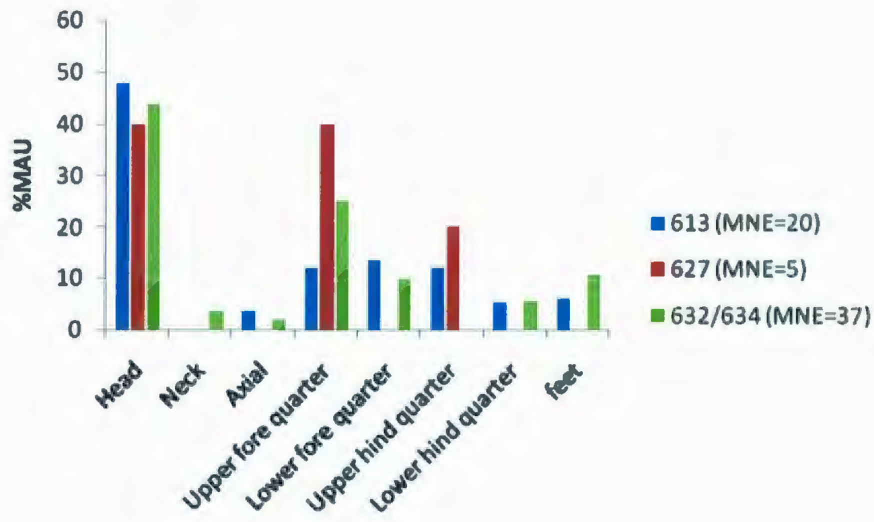

Figure 15: Caprine body portion distribution in Mansion House assemblage (%MAU).

Figure 15 displays the caprine body portion distribution in three of the Mansion House deposits. Very few caprine elements were identified in Event 627 but the MAU was still calculated for the sake of consistency. There is a definite over-representation of head elements in all three of the analyzed deposits followed by an over-representation of elements of the upper fore quarter. Like all other mammals commonly found at the site, all sections of the caprine body are represented in the Mansion House assemblage.

6.5 Evidence for Butchery

The type of cut mark and its location on a skeletal element was recorded whenever identified in the bird and mammal assemblage. Only nine bird elements displayed evidence for cut marks. One of these elements, the ulna of a glaucous gull (*Larus hyperboreus*), was chopped mid shaft as if to cut through the bone. All of the other specimens' marks seem to have been the result of a knife or sharp blade hitting the bone while trying to achieve some other task like removing skin or meat. No particular bird seems to have been especially targeted for

Figure 16 a. (left): Cut marks on an upper limb bone of a cetacean
Figure 18 b. (right): step fractures on opposite side of same element.

butchery as various different species showed evidence of cut marks, these include three duck wing bones, one chicken (*Gallus gallus*) humerus and a chicken pelvis, one double-crested cormorant (*Phalacrocorax auritus*) leg bone, a herring gull (*Larus argentatus*) wing bone, and one wing bone of an indeterminate bird species.

Of the entire mammal specimen collection recovered from the Mansion House, the only ones that show evidence of butchering are those from the five most prominent mammal species: seal, swine, caribou, cattle and caprines. Some cut marks were recorded on unidentifiable mammal species and some were recorded on what could only be identified as members of the artiodactyl order (which includes swine, caribou, cattle and caprines). The lone cetacean (whale/dolphin) element identified by the author is believed to be part of a humerus or other upper limb bone but cannot be identified with certainty due to the lack of a reference collection. It has five cut marks all on the same surface of the bone all facing the same direction (Figure 16 a). The bone also shows evidence of being shortened as two step fractures are apparent on either end of the bone on the side opposite of that with the cut marks (Figure 16 b). These types of fractures tend to occur when bone has been broken or "snapped" off due to pressure being applied on the opposite side of the bone.

Only six seal elements displayed evidence of butchery, all of which are represented by chop marks like those left behind by the blade of an axe-like tool. Three harp seal lumbar vertebrae were completely cut in half lengthwise across the centre of the vertebral body along the sagittal plane as if to separate the carcass in a left and right half. A single chop mark that did not penetrate all the way through is present on a harp seal calcaneus specimen and a left mandibular condyle of a harp seal also showed evidence of butchery. A young seal innominate has a chop mark present on the ischium, near the acetabulum.

The following figures display the locations of butchery marks as they were found in swine, caribou, cattle and sheep throughout the Mansion House assemblage. Only two types of butchery marks were identified, the majority of which were chop marks and very few of which were cut marks. A total of 15 pig (*Sus scrofa*) specimens contained direct evidence for butchery, all chop marks, and their locations are presented in Figure 17. The majority are located on the head and the feet of the pig with some marks located on a scapula, various ribs and vertebrae, a tibia and an astragalus. One thoracic vertebra was chopped in half lengthwise along a sagittal plane as if to split the carcass into a left and right side. The cut marks on the scapula were located on the anterior surface of the bone, possibly suggestive of previous disarticulation of the skeleton before this mark was placed. Some of the chop marks located on a couple of proximal

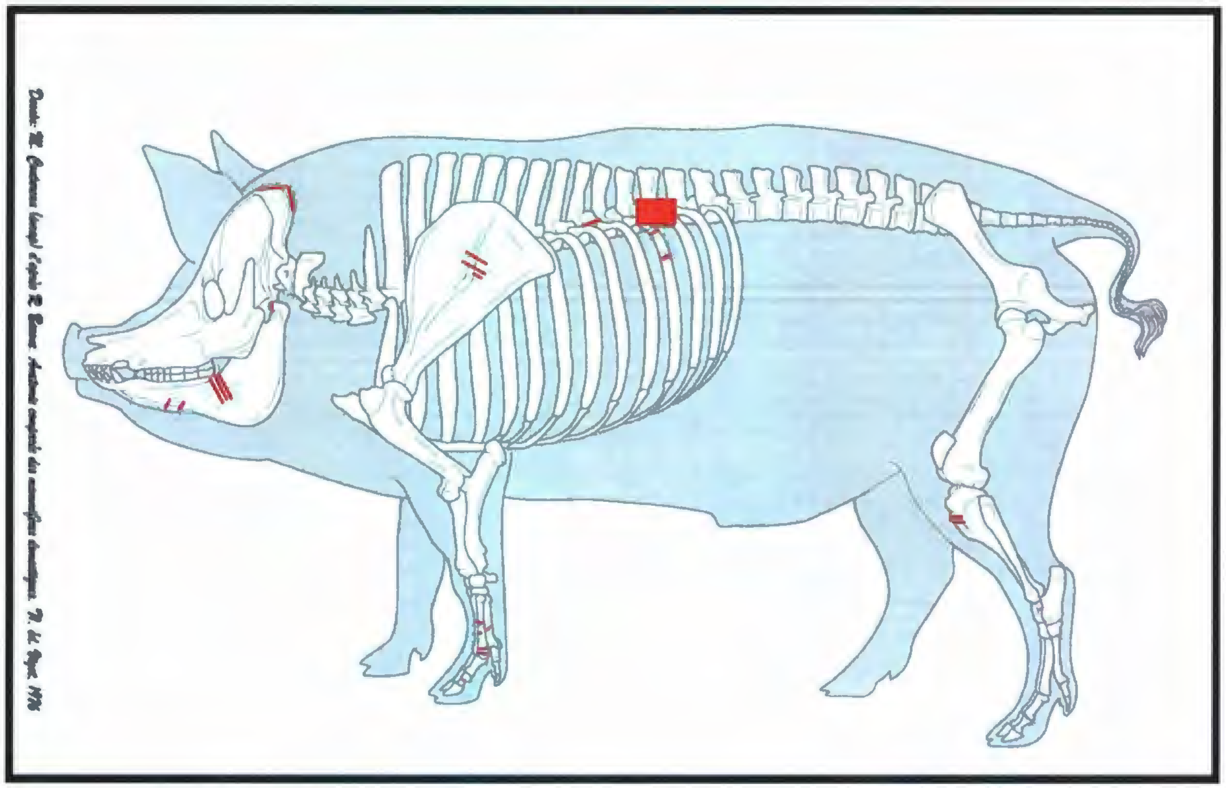

Figure 17: Location of butchery marks for the domestic pig (*Sus scrofa*) in the Mansion House assemblage. Each line represents the location of one cut mark. A red square represents the location where a vertebra was cut in half on a sagittal plane.

phalanges did not go all the way through but did open a hole to the marrow cavity of these small bones.

Over 18 different caribou specimens displayed evidence of butchery and these are presented in Figure 18. A total of six vertebrae, five thoracic and one lumbar, were completely cut in half on the sagittal plane as if to separate the carcass into a left and right side down the middle. There were relatively few marks on the limbs with only a few on the femur and in the pelvic area, a few in the knee area and a couple markings midway through a few metacarpal bones. The majority of the cut marks seem to be focused on the vertebrae and the ribs. All marks seem to be the result of a chopping action except for one rib specimen that showed

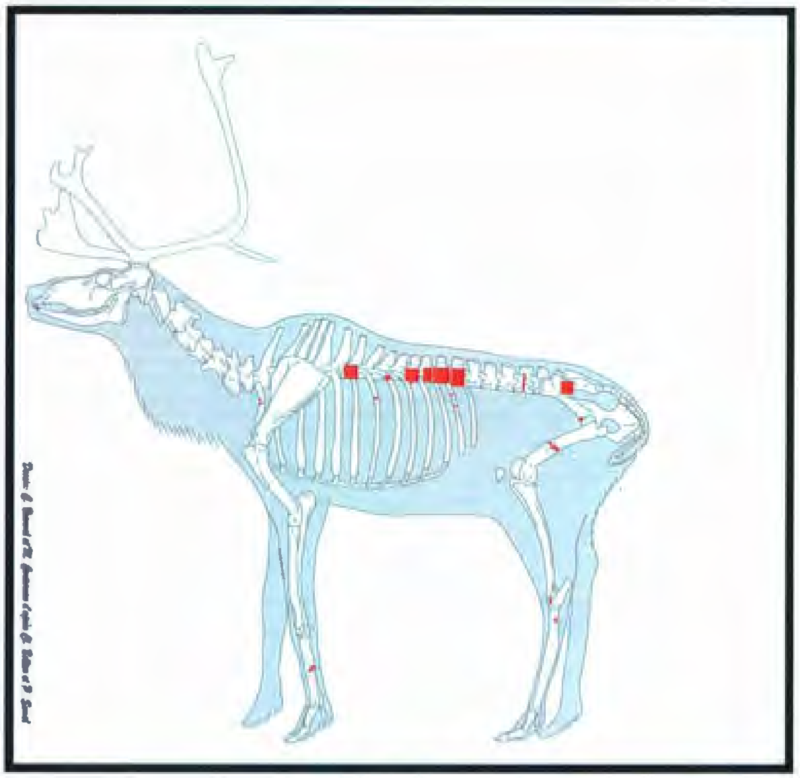

Figure 18: Location of butchery marks for the caribou (*Rangifer tarandus*) in the Mansion House assemblage. Each line represents the location of one cut mark. A red square represents the location where a vertebrae was cut in half on a sagittal plane.

three cut marks slightly below the tubercle, possibly the result of cutting with a knife or other sharp blade.

Cow specimens displayed more signs for butchery than any other species at the site, with evidence of chop marks found on 38 specimens representing almost every region of the body except for the neck and feet (Figure 19). All major joints except for the carpals showed evidence of disarticulation and the vertebrae and the ribs were equally affected. There is evidence for disarticulation of the mandible, disarticulation of the front limb from the body at the level of the scapular neck, and disarticulation of the lower front limb from where the radio-

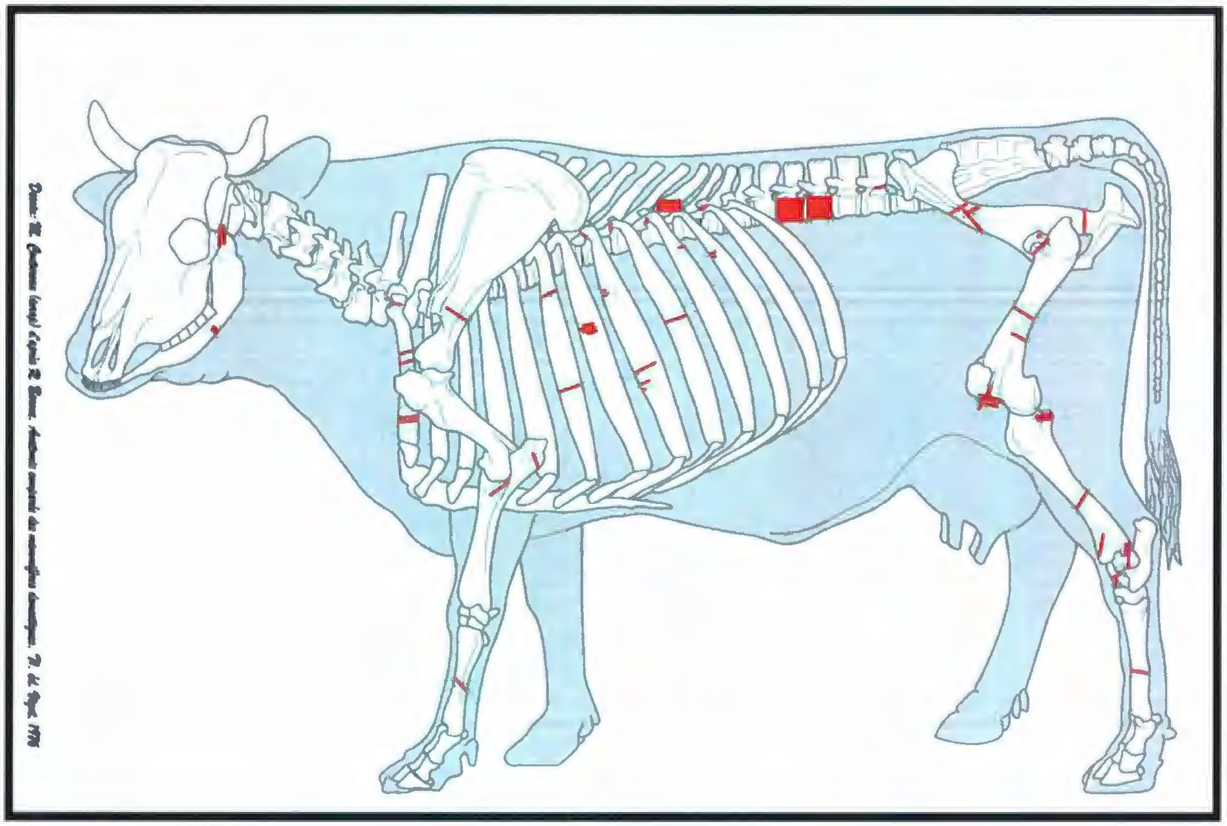

Figure 19: Location of butchery marks for the domestic cow (*Bos taurus*) in the Mansion House assemblage. Each line represents the location of one cut mark. A red square represents the location where a vertebrae was cut in half on a sagittal plane.

ulna meets the humerus. There were repeated chop marks on multiple innominate fragments at the narrowest part of the illium, above the acetabulum, suggesting a standard carcass butchering technique; this mark was also observed on a caribou specimen at the same location. There is evidence for disarticulation at the knee and evidence that the feet may have been removed by cutting through the shaft of the metapodial bone or by cutting through the tarsal bones, as various chop marks were found in that region.

Only five sheep/goat specimens displayed evidence of butchery: three humerus specimens, one sacrum and one tibia (Figure 20). The repeated presence of chop marks found

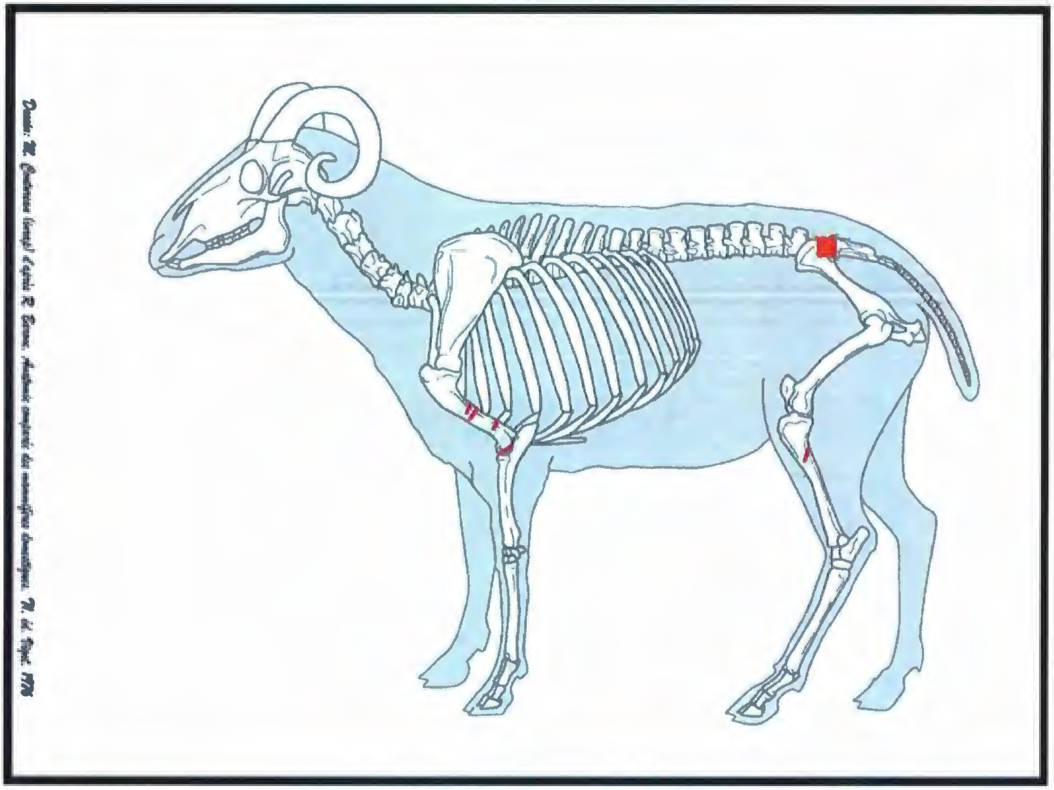

Figure 20: Location of butchery marks for the sheep/goat specimens (Caprine sp.) in the Mansion House assemblage. Each line represents the location of one cut mark. A red square represents the location where a vertebrae was cut in half on a sagittal plane.

on three different humeri suggests a standard disarticulation practice separating the upper fore quarter from the lower fore quarter. The chop mark on the upper tibia may have served a similar purpose of separating the upper hind quarter from the lower hind quarter. The sacrum specimen was chopped along the sagittal plane as if separating the element into left and right sides.

6.6 Ageing

Here are presented the age distributions for seal, swine, caribou, cow and sheep/goat specimens recovered from the Mansion House assemblage according to the timing of epiphysial fusion, tooth eruption and tooth wear. In order to increase the sample, specimens aged by Lisa

Hodgetts from other areas of the site are included in these profiles. Information is presented according to the number of identified specimens. Appendix IV presents the age at death distributions for each event separately.

Seals lose their deciduous teeth in utero, therefore tooth eruption sequences cannot be analyzed to determine age of skeletal specimens and so we must rely on the timing of epiphysial fusion to provide age at death profiles (Storå 2000: 200). The order of epiphysial fusion is relatively similar among various members of the phocidae taxonomic family. Considering the importance of harp seal (*Phoca groenlandica*) at the site, all phocidae identifications are treated as that one species for the purpose of age at death profiles.

Table 11:Minimum number of elements in each skeletal age group

Age Class	Skeletal Age Group	MNE
Yearlings	1	2
	1– 2	4
	3	1
Juveniles	4–5	0
Adults		
Young Adults	6	0
Old Adult	7	4
	7–8	2
	8	3
YA/OA	6–8	3
Other		
Yearling/Juvenile	1–4	2
Yearling/Juvenile/YA	1–6	1
Juvenile/YA/OA	4–8	4

Table 12: Minimum number of elements attributed to specific age classes

	MNE	%MNE
Yearling	7	37%
Juvenile	0	0%
Adult (young and old)	12	63%
Total	**19**	**100%**

Table 11 presents the results from the age at death analyses of epiphysial fusion for the seal assemblage at Ferryland. The organization of the results follows that of Hodgetts (2005). Results show a significant presence of both young and adult seals. Table 12 indicates that 37 percent of the seal assemblage is represented by specimens that are less than a year old. A yearling's scapula was identifiable as harp seal.

Ten pig mandible specimens were aged according to timing of tooth eruption (Table 13). Not included in this table are three mandibles and one maxilla, found alongside other juvenile elements associated with neo-natal individuals that died before birth or shortly thereafter. A number of small deciduous incisors and premolars were also identified in the assemblage. The presence of these specimens indicates that pigs were reproducing on the site. A number of loose adult teeth and a few mandibles with teeth still in them show signs of extensive use-wear and others do not show much sign of use-wear at all, suggesting a highly variable age at death range based on the small numbers of mandibles recovered. Table 13 shows a wide range and evenly distributed set of age categories present across the site.

Table 13: Ages of Pig (*Sus scrofa*) mandibles recovered from the Mansion House assemblage

Birth -7 weeks	Birth - 4 months	4 -22 months	4-24 months	12-16 months	12-24 months	16 months +
1	1	3	1	2	1	1

Table 14 presents the age at death distribution of pig elements based on the timing of epiphysial fusion. It indicates that a full range of young and old pigs were present on the site but the majority of the population was killed prior to reaching two years of age. The elevated number of neo-natal specimens recovered from the privy was not included in this age profile so as not to skew the data. The presence of these individuals is not ignored and will be discussed in the following chapter.

Table 14: Age at death distribution of domestic pig (*Sus scrofa*) elements at Ferryland. Based on the timing of epiphysial fusion. Includes data analyzed by Lisa Hodgetts (2003).

Age range	Bone and epiphysis	Fused	Unfused
0-12 months	Scapula	2	1
	Innominate	3	1
	Humerus – distal	1	1
	Radius – proximal	2	1
	Second phalanx – distal	6	0
	Percent Age Range	**29%**	**8%**
12 - 24 months	Metacarpal – distal	2	3
	First phalanx – proximal	4	2
	Tibia – distal	2	1
	Percent Age Range	**16%**	**12%**
24 - 30 months	Calcaneus	2	3
	Metatarsal – distal	1	0
	Fibula – distal	0	0
	Percentage Age Range	**6%**	**6%**
36 - 42 months	Humerus – proximal	0	0
	Radius – distal	0	2
	Ulna – proximal	0	2
	Ulna – distal	0	0
	Femur – proximal	0	2
	Femur – distal	1	2
	Tibia – proximal	0	0
	Fibula – proximal	0	0
	Percent Age Range	**2%**	**16%**

Unfortunately, only one fragment of a caribou mandible was recovered and the two teeth that were in it displayed some type of pathology where it looks like they grew into each other. Therefore, I am unable to describe the distribution of caribou ages based on data obtained from tooth eruption sequences. Only five loose caribou teeth were identified in the Mansion House, further indication that caribou head elements are under-represented in the assemblage, especially when considering the fact that head elements are the most over-represented body portions for the pig and the sheep.

Table 15: Age at death distribution of caribou (*Rangifer tarandus*) elements at Ferryland. Based on timing of epiphysial fusion. Includes data analyzed by Lisa Hodgetts (2003).

Age of fusion	Bone and epiphysis	Fused	Unfused
4-12 Months	Vertebral centra (4-6)	3	3
	Radius – proximal (4-9)	1	0
	Acetabulum (10-12)	4	0
	Percent Age Range	**14%**	**5%**
7-24 Months	Second phalanx (7-18)	7	0
	Humerus – distal (17-21)	1	1
	First phalanx (18-21)	9	3
	Tibia – distal (19-24)	2	0
	Percent Age Range	**33%**	**7%**
25-39 Months	Calcaneum (25-27)	4	3
	Metacarpal (25-27)	3	1
	Metatarsal (25-27)	0	0
	Ulna – distal (28-33)	0	0
	Ulna – proximal (28-39)	0	0
	Percent Age Range	**12%**	**7%**
28-40+ Months	Radius – distal (28-40+)	0	1
	Femur – distal (28-40+)	1	1
	Tibia – proximal (28-40+)	0	1
	Femur – proximal (31-40+)	3	2
	Humerus – proximal (40+)	0	2
	Sacrum (40+)	0	1
	Percent Age Range	**7%**	**14%**

Table 15 presents the NISP of caribou specimens aged according to their state of epiphysial fusion for the entire Ferryland assemblage. There appears to be a more equal distribution of age at death when compared to the pig specimens previously described in Table 14, especially with regards to the number of older individuals.

Like the caribou, not many cow mandibles with teeth were recovered from the Mansion House assemblage and only one mandible fragment could be assigned an age of 18 to 30 months based on the eruption sequence. However, 29 loose teeth were recovered, including incisors, pre-molars and molars indicating that more mandibles were originally present in the deposit. A

Table 16: Age at death distribution of domestic cow (*Bos taurus*) elements at Ferryland. Based on timing of epiphysial fusion. Includes data analyzed by Lisa Hodgetts (2003).

Age of fusion	Bone and epiphysis	Fused	Unfused
0-12 Months	Scapula	2	0
	Innominate	3	1
	Percent Age Range	**20%**	**4%**
12-24 Months	Humerus – distal	0	0
	Radius – proximal	2	0
	First phalanx – proximal	1	0
	Second phalanx – proximal	1	0
	Percent Age Range	**16%**	**0%**
24-36 Months	Metacarpal – distal	1	0
	Tibia – distal	1	0
	Metatarsal – distal	1	0
	Metapodial – distal	0	0
	Percentage Age Range	**12%**	**0%**
36-48 Months	Humerus – proximal	0	0
	Radius – distal	0	0
	Ulna – proximal	0	1
	Ulna – distal	0	0
	Femur – proximal	0	5
	Femur – distal	0	2
	Tibia – proximal	1	2
	Calcaneus	1	0
	Percent Age Range	**8%**	**40%**

few of these were deciduous, suggesting the presence of young calves at the site and some teeth were quite well worn. However they were not assigned a Grant tooth wear stage as they were not found in a mandible and many of them could not be identified as upper or lower molars.

The age at death distribution for cattle according to timing of epiphysial fusion is shown in Table 16. The most obvious observation one can make from this table is that the majority of cattle seem to be culled sometime before reaching three to four years of age. Enough sheep/goat toothed elements were recovered from the Mansion House assemblage to get a decent idea of the age ranges of the caprine assemblage (Table 17). The majority of this assemblage is quite young with only three maxilla specimens over 21 months of age. Only two mandibles had at least one of their permanent molars in place and the Grant tooth wear analysis indicates that they had only recently erupted before death with tooth wear stages ranging in between levels "c" and "e". Grant tooth wear analysis on deciduous lower premolar 4 indicates that this tooth received more wear than the first and second molars when present in the same mandible with tooth wear stages ranging from "f" to "g".

Table 18 reveals an interesting pattern correlating with the data obtained from the ageing of toothed elements. Only a small percentage of the caprine population at the site was killed before reaching ten months of age. However, over 45 percent of the caprine population, based on the recovered sample, were killed prior to reaching 36 months of age.

Table 17: Age of caprine mandibles from the Mansion House assemblage based on sequence of tooth eruption.

	0-18 Months	9 Months +	12-21 Months	‹ 21 months	21 Months +
# Mandibles	3	1	2	2	0
# Maxillae	0	2	0	0	3

Table 18: Age at death distribution of caprine elements at Ferryland. Based on timing of epiphysial fusion. Includes data analyzed by Lisa Hodgetts (2003).

Age of fusion	Bone and epiphysis	Fused	Un-fused
6-10 Months	Scapula	3	0
	Innominate	2	0
	Humerus – distal	2	2
	Radius – proximal	0	0
	Percent Age Range	**24%**	**7%**
12-36 Months	Ulna – proximal	0	2
	Ulna – distal	0	0
	Metacarpal – distal	1	0
	Femur – proximal	0	0
	Tibia – distal	0	1
	Metatarsal – distal	1	0
	Metapodial – distal	1	1
	Calcaneus	0	0
	First phalanx – proximal	4	2
	Second phalanx – proximal	0	2
	Percent Age Range	**24%**	**28%**
36-42 Months	Humerus – proximal	0	0
	Radius – proximal	2	0
	Femur – distal	0	2
	Tibia – proximal	0	1
	Percent Age Range	**7%**	**10%**

6.7 Sexing

Only three specimens recovered from the Mansion House assemblage were indicative of the sex of their progenitor. One of these was an indeterminate long bone fragment from an indeterminate bird that was filled with medullary bone, the substance used to create eggshells, indicating the bird was female. Two tusks (lower canines of male pigs) were also identified in the assemblage.

6.8 Taphonomy

Table 19 presents the number of specimens for each of the Mansion House's deposits that showed signs of various taphonomic modifications. The Mansion House assemblage does not seem to have been very affected by any directly observable taphonomic process that left traces of destruction on the bone. Event 613 seems to be generally the most affected by taphonomic processes such as carnivore gnawing and burning but not in any significant level. The majority of Event 678's small sample was weathered indicating that this deposit was possibly exposed to natural elements such as wind or water possibly related to these specimens location within a sub-floor drain. Damage to bone resulting from extended periods of contact

Table 19: %NISP of specimens affected by selected taphonomic processes for deposits in the Mansion House assemblage

Event	Carnivore gnawing		Burnt		Weathered		Copper stain		Iron Stain		Cut mark	
	NISP	%NISP	NISP	%NISP	NISP	%NISP	NISP	%NISP	NISP	%NISP	NISP	%NISP
613 (n=1320)	34	2.6	22	1.7	36	2.7	6	0.5	20	1.5	32	2.4
626 (n=102)	0	0	0	0	0	0	0	0	0	0	5	4.9
627 (n=720)	5	0.7	4	0.6	15	2.1	0	0	6	0.8	27	3.8
630/631 (n=87)	0	0	0	0	0	0	0	0	0	0	0	0
632 (n=356)	3	0.8	0	0	14	3.9	0	0	3	0.8	8	2.2
633 (n=69)	0	0	0	0	0	0	0	0	3	4.3	4	5.8
634 (n=4908)	14	0.3	1	0	18	0.4	2	0	15	0.3	35	0.7
636 (n=12)	0	0	0	0	2	16.7	0	0	0	0	1	8.3
651 (n=376)	6	1.6	7	1.9	12	3.2	2	0.5	1	0.3	12	3.2
652 (n=111)	4	3.6	1	0.9	4	3.6	0	0	1	0.9	4	3.6
665 (n=3)	0	0	0	0	1	33.3	0	0	0	0	0	0
678 (n=16)	0	0	0	0	10	62.5	0	0	0	0	0	0
696 (n= 3)	0	0	0	0	0	0	0	0	0	0	0	0
713 (n=55)	1	1.8	0	0	0	0	0	0	0	0	3	5.5

with metals such as copper and iron occurred throughout the site but in no significant amount. The most destructive taphonomic process acting upon this assemblage relates to the intentional butchery and disarticulation of carcasses by the Mansion House's former inhabitants.

Table 20: Distribution of Rats and Mice (NISP) and distribution of rodent damaged bones in the Mansion House assemblage

Event	Muroidea NISP	NISP rodent damaged bone	%NISP rodent damaged bone
613	3	3	0.2
626	0	0	0.0
627	24	8	1.1
630/631	0	0	0.0
632	0	2	0.6
633	1	4	5.8
634	192	26	0.5
636	0	0	0.0
651	25	7	1.9
652	1	0	0.0
665	0	0	0.0
678	0	0	0.0
696	0	0	0.0
713	0	4	7.3

Table 20 presents the distribution of mice and rat elements alongside the number of bones that have been damaged by such rodents. The purpose of this comparison was to see if deposits that contained the higher numbers of small rodents also contained the highest number of bones damaged by rodents. Interestingly there is no correlation between where the rats are found and where the highest numbers of damaged bones are located. The destruction of bone by rodents is not a big issue affecting the Mansion House assemblage.

Chapter 7: Discussion and Interpretation of Results

Chapter 6 presented the detailed results of the faunal analysis and in doing so, provided an answer to the first research question of this thesis. The current chapter serves to freely discuss these results and interpret them according to our knowledge of the site, its archaeology and the culture history of its occupants, all while applying the appropriate theoretical paradigms. This chapter provides the logic and reasoning behind the interpretation of the assemblage, addresses the remaining research questions that were first described in Chapter 1, and tackles the main research goal. It provides a discussion on the economic importance of the species found at the site, highlights the commonalities and differences among the Mansion House deposits and between the Mansion House assemblage and other areas of the site. The chapter ends with a discussion on wealth and socio-economic status as it applies to the diet and foodways of the Mansion House's former inhabitants bringing together results from the analysis with the background information provided earlier in this document.

7.1 State of the Deposit

The identifiability of specimens to the level of taxonomic family or lower ranged from 34 to 45 percent for the more sizable Mansion House deposits. Table 21 presents the percentage of identified specimens for all of the other faunal deposits in Ferryland as identified by Hodgetts (2006, 2009). Taking the ability to identify a bone to the level of taxonomic family or lower as a sign that specimens did not undergo severe taphonomic alterations then one can say that, based on these numbers, the Mansion House deposit is one of the better preserved faunal assemblages on the site. However, it is not the only one. The bake/brew house and intermediate privy deposits both have equally elevated numbers. Assemblages from the early

Table 21: % NISP of other Ferryland assemblages identified to the level of taxonomic family or lower. From Hodgetts (2006, 2009).

Assemblage	% Identified NISP
Early Privy	28
Intermediate Privy	47
Late Privy	16
Early Midden	27
Bake/Brew House	44
Kirke House	28
Front Door Midden (Mansion House)	45

and late privy deposits as well as those from the early midden and the Kirke House were not so readily identifiable.

Heavy fragmentation, carnivore and rodent damage, extensive exposure to the natural elements such as sun, wind and rain, are all destructive taphonomic forces whose effect on the Mansion House assemblage was minimal. The destruction of bone as a result of butchery was the most destructive of the identified taphonomic processes but it too did not affect much of the assemblage. Based on this evidence, it appears that the Mansion House faunal assemblage is relatively well preserved and data derived from the analysis of its faunal remains is not likely to reflect a heavy bias related to natural preservation conditions. The application of ¼ inch mesh screen possibly lead to the loss of fish remains and that of other small faunal fragments thus introducing a bias that should be kept in mind during analysis (James 1997).

The analysis of cod body portion distribution presented in Figure 7 provides us with some information regarding the consumption of fresh fish and salt cod fillets, as will be further discussed later in this chapter. However, the same analysis provides information about the preservation of fish remains at the site. The most abundant cod elements recovered from the

Mansion House assemblage are the vertebrae. The over-representation of both caudal and pre-caudal forms suggests that many codfish were consumed at the site. The noticeable under-representation of the thinner and more fragile elements of the skull and pectoral girdle suggests that few of these survived long enough to be recovered and/or identified. Nevertheless, an elevated minimum number of cod skulls was recorded based on the presence of thicker and therefore more resistant skull elements such as the maxilla, dentary, cleithrum, post-cleithrum and post-temporal. Their elevated numbers tell us that cod skulls were equally present in the assemblage but that not all of its elements were resistant to the taphonomic processes to which they were subjected over time (see Appendix V). The poor preservation of some of the fish skeletal elements must be taken into account when interpreting the results of this faunal analysis.

It is important to note here some of the assumptions being made regarding this faunal material. Mainly, the assumption that the faunal remains recovered are representative of what was originally deposited and what was deposited is representative of the household's diet. The majority of the assemblages and all of the major assemblages appear to be household midden deposits which are likely to have contained leftover meals. However, taphonomic and formation processes acting upon these assemblages have influenced the analysis of the materials. Therefore the assumption that the deposited remains are representative of the household's diet is still valid but what has been recovered may not be entirely representative of what was originally deposited.

7.2 Economic and Dietary Importance of Identified Species

Figure 6 of Chapter 6 indicates that there is a similar distribution of fish, bird and mammalian specimens throughout the Mansion House. This consistency throughout the deposits supports the idea that they share something in common (i.e., their association with the Mansion House). It would appear that the diet of the Mansion House's inhabitants was primarily based on the consumption of mammals. However, the consumption of fish did play an important role in their diet. The poor preservation of some fish skeletal elements suggests that fish may have played a more important role in the diet than the number of recovered bones would suggest. The presence of birds in the assemblage was not as significant as that of mammals and fish, but their numbers do suggest that they played some regular role in the diets of the building's former inhabitants. The front door midden deposit analyzed by Hodgetts (2006, Figure 2) displays a similar consumption pattern to the other Mansion House deposits. The fact that the same pattern was found in another Mansion House deposit investigated by another analyst supports the idea that all of these deposits are related.

When compared to other areas of the site, it is noticeable that the exploitation patterns found in the Mansion House deposits(Figure 21) are not shared with all of the other faunal deposits previously analyzed by Hodgetts (2006, 2009), although small sample sizes may sometimes be a factor (Figure 22). All of the Mansion House events, including that of the front door midden analyzed by Hodgetts, display similar patterns. The privy is primarily composed of fish remains with few bird or mammal specimens. The bake/brew house as analyzed in Hodgetts (2006) shows a pattern slightly similar to that of the Mansion House but with a higher number of fish specimens. However, when considering the body mass associated with fish compared to that associated with mammals, the latter would still represent the primary dietary component in that assemblage. The bake/brew house does not,

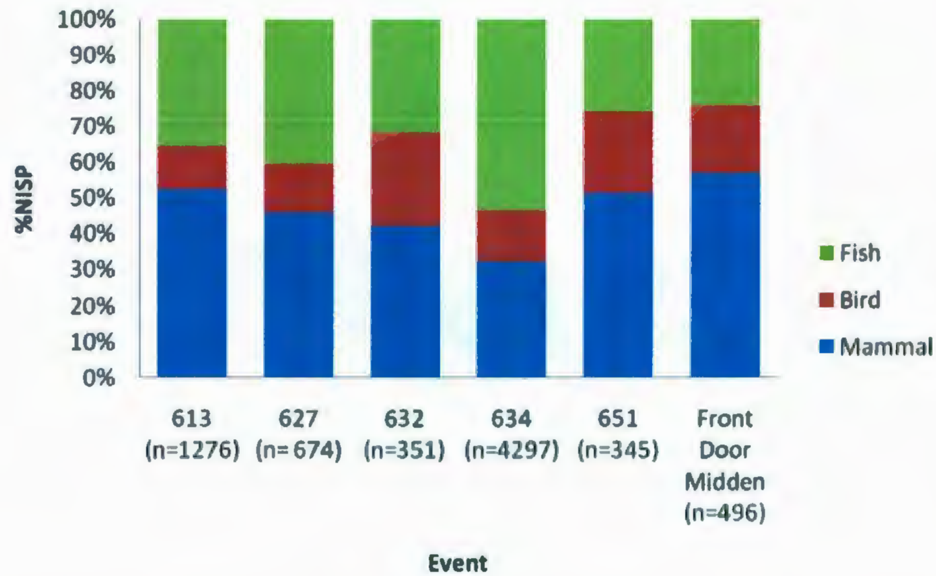

Figure 21: Class exploitation for Mansion House deposits. Front door midden data from Hodgetts (2006).

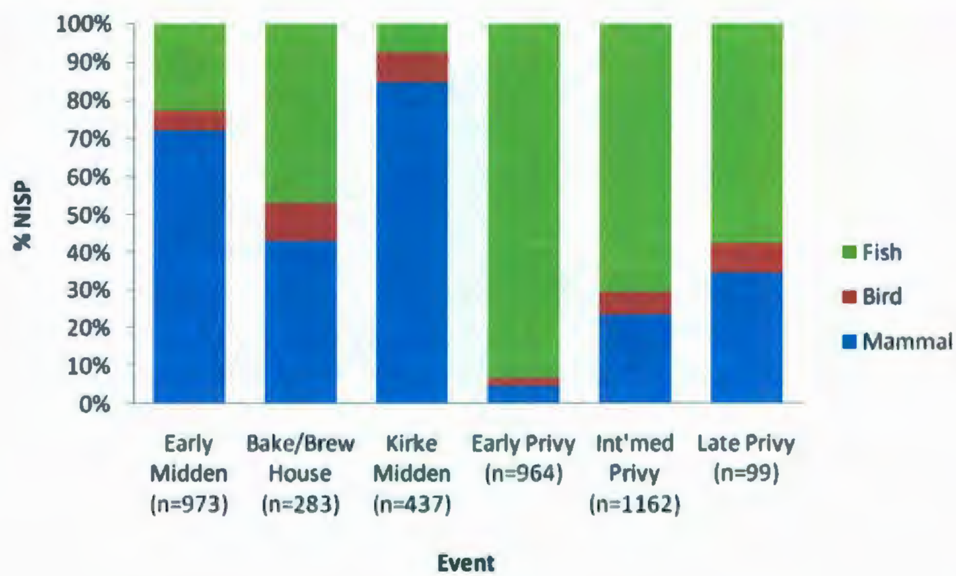

Figure 22: Class exploitation for other Ferryland faunal deposits. Data from Hodgetts (2006, 2009).

however, share a similar number of bird specimens to that seen in the Mansion House. The early midden deposit has a greater percentage of mammalian remains, fewer fish and displays a significantly smaller avian population. The exploitation pattern found in the Kirke House assemblage is strikingly different from all other assemblages in Ferryland. It has the largest mammalian representation with only some bird and even fewer fish remains. It was expected that the Kirke House would display an assemblage closer to that of the Mansion House since the deposits share the same period of occupation and similar social status. As both Hodgetts (2006) and the evidence on fish preservation suggest, it is highly possible that the variation in the importance of fish amongst the different assemblages are simply a result of varying preservation conditions throughout the site and not entirely that of differential consumption habits.

7.2.1 Molluscs

As mentioned in the previous chapter, the two gastropod specimens recovered from the site are probably intrusive snail specimens, naturally present in the soil and not associated with the seventeenth-century occupation of Ferryland.

The presence of bivalves, the only other type of mollusc found within the Mansion House assemblage is likely related to the occupation of the building as these species are not naturally found in the soil. Only 15 different specimens were identified from the Mansion House and none of these were identifiable beyond taxonomic class. However, Hodgetts (2006, 2009) identified members of the *Mytillus* genus (mussels) in the Kirke midden, the early midden and in the early and intermediate privy deposits. Based on the author's slight familiarity with mussel shells and on Hodgetts' previous identifications, it is very likely that all but one of the bivalve specimens recovered from the Mansion House are also from the *Mytillus* genus. Mussels were found in larger quantities in the privy and early midden deposits and their relatively low numbers in the Mansion House deposits suggests that mussel consumption by its residents was not too common an occurrence. Hodgetts (2009) discusses the possibility that many of the mussel remains she recovered from the privy may not have been used for food but rather as bait for the cod fishery. James Younge's diary (Poynter 1963: 60) describes mussels and herring as a good source of bait in the early months of the fishery before the arrival of capelin to the Avalon's shore. Many of the mussel species found in Newfoundland waters could be easily collected along the coastline in the Ferryland area and it is therefore likely that no significant amount of time was spent in their harvesting. Today, mussels can be collected by the bucketful just outside of the arm of The Pool (Gaulton 2009, personal communication). The presence of bivalves in the overall distribution of faunal remains throughout the site suggests that, even if mussels had a role as part of the Ferryland diet, it wasn't a very important one.

No lobster, crab or any other crustacean remains were recovered from the Mansion House nor from any other part of the site other than the privy (Hodgetts 2009), suggesting that these did not play an important role in the diet and foodways of the Mansion House's inhabitants or for Ferryland residents in general or that their exoskeletons did not survive in the archaeological record.

7.2.2 Fish

The Atlantic cod (*Gadus morhua*), the Atlantic herring (*Clupea harengus*), the arctic flounder (*Pleuronectes glacialis*) and a member of the Salmonidae family have all been previously identified in different areas of Ferryland by Hodgetts (2006, 2009). Identifications of Atlantic cod specimens or of specimens designated to its taxonomic family (Gadidae sp.), dominate the fish assemblage throughout the site. This isn't surprising as the Atlantic cod fishery was the primary economic focus for the community. Its strong presence in domestic areas of the site, including in the Mansion House assemblage, suggests that this fish not only played an important role in Ferryland's economy but also in the diet of its residents. The presence of Atlantic herring and arctic flounder could represent by-catch from the cod fishery, as was a common occurrence, rather than their targeted exploitation. Hodgetts (2009: 11) suggests that the Atlantic herring, remains of which she identified in the privy, may have been used as bait in the cod fishery. However, its recovery in four different deposits associated with the Mansion House, a residential building not directly associated with fishery activities on the site, suggests that these represent the remains of animals likely consumed as food. The presence of a member of the salmon family, whether it is an anadromous Atlantic salmon or arctic char or a fresh water trout, indicates this was a specifically targeted species. Hodgetts (2009: 11) notes that the privy contained the largest variety of fish species previously identified in Ferryland and that it was the only location where Atlantic herring and Atlantic mackerel (*Scomber scombrus*) were found. She attributes this to the excellent preservation conditions afforded by the privy towards organic remains. The Mansion House assemblage also has above average organic preservation conditions compared to the remainder of the site and it too contained a few specimens of Atlantic herring, thus supporting the argument that these "rare" species may have provided a greater dietary contribution than would be suggested by the number of surviving faunal remains.

As was previously discussed, the catching and processing of Atlantic cod was the primary economic activity in seventeenth-century Ferryland. The fish was transformed on the site into a marketable salted product that could be shipped to far away markets. The recovery of skeletal elements from all portions of the body suggests that these fish were being consumed fresh throughout the late spring, summer and fall. What's more, the presence of the entire body in deposits associated with the Mansion House specifically indicates that fresh fish were processed somewhere within or near the vicinity of the structure. The body portion distribution analysis of cod (Figure 7, Chapter 6) indicates that the events located within Structure 18 (Events 632 and 634) show some kind of over-representation of salt-cod associated elements. The other deposits seem to have distribution resembling the naturally expected ratio. Assuming that this is not only an effect of differential preservation conditions, the over-representation of salt cod associated elements in Structure 18 suggests that salt cod may have been kept in the building's cellar to serve as provisions for the winter months when fish was not as easily accessible. If Lent was observed by Ferryland's residents, then salt fish products would have been the only meat worthy of consumption during that period (Wilson 1973: 32). Wilson (1973) notes that it was the lower classes in Britain who were the primary consumers of salted fish products. However, this does not seem to be the case in Ferryland where it appears that fish played an important role in almost all of the site's different deposits. Bowen and Trevarthen-Andrews (2000: 11) note that Medieval high-cuisine normally incorporated a large variety and quantity of fish in their diet. It would appear that a large quantity of fish was consumed in Ferryland, variety however, does not seem to have been the case. Based on comparisons with the work of Hodgetts (2006, 2009) it doesn't appear that the residents of the Mansion House were eating either a larger quantity or a greater variety of fish than those from other areas of the site.

7.2.3 Birds

The level of diversity in bird species found in the Mansion House is unrivalled anywhere else on the site, including in the well preserved privy assemblage. Over 29 different bird species were identified within the Mansion House using the same reference collection as that used by Hodgetts (2006, 2009) at the Canadian Museum of Nature. The privy only contained seven different species whereas the Kirke Midden contained three different species, the early midden and the bake/brew house each contained only two different species. A total of 11 different bird species were identified from the entire site of Ferryland, excluding the Mansion House deposits. It is possible that the reason for some of this discrepancy is due to sample size or differential preservation conditions since, as a whole, the Mansion House assemblage comprises over 1100 bird specimens whereas the largest of the assemblages from other areas of the site contain at most only 95 bird specimens. However, there are multiple lines of evidence that suggest the variety of bird species is significant to the Mansion House deposit. First of all, Hodgetts (2006) analyzed one of the Mansion House's deposits; the front door midden, and despite its small size,

Table 22: Number of Identified Bird Species vs. Sample Size. Including data from Hodgetts (2009)

Event	Number of Identified Species	Sample Size
613	16	153
626	0	4
627	13	92
630-631	0	5
632	4	89
633	4	28
634	14	626
636	1	2
651	11	78
652	3	17
665	0	1
713	2	5
Front Door Midden	11	80
Kirke Midden	3	32
Bake house	2	21
Early midden	2	28
Privy	8	95

she identified 11 different species within it. Table 22 compares the number of identified species in each one of the Mansion House deposits and in each one of the deposits analyzed by Hodgetts (2006, 2009). Many of the Mansion House deposits are comparable in size to deposits from other areas of the site, and yet display larger numbers of identified species. Even some of the smaller Mansion House deposits like Event 633, which only has a total of 28 bird specimens, contains four different species plus two different taxonomic families suggesting the presence of six different species in that single small deposit.

The most common bird species recovered from the Mansion House assemblage as well as from the other assemblages in Ferryland are types of birds that are commonly found flying above the community and on the waters around its shores. These include various species of marine ducks, members of the auk family (Alcidae) and various species of gulls. Common eider (*Somateria Mollissima*), great black-backed gull (*Larus marinus*), herring gull (*Larus argentatus*) and the common murre (*Uria aalge*) are some of the most common individual species and likely represent some of the most commonly consumed types of birds at the site. The Mansion House is the only residential deposit where the remains of domestic fowl have been recovered including the chicken (*Gallus gallus*), the domestic goose (*Anser anser*), the domestic pigeon (*Columba livia*), and the turkey (*Meleagris gallopavo*), which is not technically domesticated but is not native to Newfoundland and therefore was transported by Europeans to the island. Turkey is not believed to be a significant contributor to the residents' diets but chicken bones were found in a small yet significant amount throughout some of the Mansion House's deposits. More important, in terms of dietary contribution, is the willow ptarmigan (*Lagopus lagopus*) which is the single most abundant bird species in the Mansion House assemblage in terms of NISP. Its prime habitat in Newfoundland is in the Barrens (Montevecchi and Tuck 1987: 28). It is not found in any other domestic deposit in Ferryland and only one specimen was recovered from the privy (Hodgetts 2009). The species' relative abundance throughout many of the Mansion House's deposits suggests it played a role in the diet and foodways of the structure's inhabitants. The Mansion House is the only domestic deposit on the site that has so far revealed bird species commonly found in the island's interior. The occasional but not irregular presence of specimens representing species not normally associated with human consumption such as the common raven (*Corvus corax*), cormorants (*Phalacrocorax* sp.), and shorebirds like the common sandpiper (*Actitis macularia*) are present in the Mansion House assemblage as they are in other areas of Ferryland. Bowen and Trevarthen-Andrews (2000: 6) remind us that such species including sea gulls, were normally consumed by Europeans in the seventeenth century and they are a common occurrence in the Jamestown deposits from that time period. Raptors, such as the bald eagle (*Haliaeetus leucocephalus*), the great horned owl (*Bubo virginianus*) and the snowy owl (*Bubo scandiacus*) are unique to the Mansion House. These birds were considered taboo species not available for human consumption along with the horse, dog, cat, rats, mice and other humans (Bowen and Trevarthen-Andrews 2000: 9). The unique presence of raptors and ptarmigan in the Mansion House assemblage warrant further discussion later in this chapter.

As for the exploitation of the nearby bird colonies of Witless Bay, there is no clear evidence for or against it. Many of the species found in these bird colonies are present in the Mansion House assemblage but they also frequent the Ferryland area. Some of the species that currently breed in these massive colonies such as the northern fulmar (*Fulmarus glacialis*), Leach's storm petrel (*Oceanodroma leucorhoa*) and the common puffin (*Fratercula arctica*) are not found in Ferryland suggesting that these species were not often consumed by its residents, or they were not regularly present in the Ferryland area and the abundance of species in the community's immediate vicinity did not necessitate traveling north 26 kilometres up the coast. It is possible that some yet unknown bird colony previously existed closer to the Ferryland area.

7.2.4 Mammals

Mammals played an important role in the diets of Ferryland's inhabitants. However, not all species were equally important and some of them were not consumed as food at all.

Rabbits and Hares

The near lack of these animals suggests that domestic rabbits or wild hares did not play a significant role in the diet of the Mansion House's inhabitants. The inclusion of rabbits and hares into dinner recipes was not uncommon in fifteenth- and sixteenth-century England (Wilson 1973: 81-92) but this doesn't appear to have been the case in Ferryland. A stronger presence of rabbits was expected based on a written statement whereby Captain Wynne asked Calvert to send them some conies for breeding (Wynne, 26 August, 1661, in Pope 1993). It appears that very few if any were raised and consumed by the residents of the Mansion House or in Ferryland in the later seventeenth century.

Rats and Mice

Rats and mice were a taboo species and not normally consumed by Europeans (Bowen and Trevarthen-Andrews 2000: 9). Black rats (*Rattus rattus*), are climbers and typically build their nests in trees or in the upper levels of buildings (Bowen and Trevarthen-Andrews: 19) and their overwhelming presence in the Mansion House assemblage suggests that rat infestations were a daily problem for Ferryland residents and that these creatures would have readily taken advantage of any improperly stored food product. The strong presence of rats relative to that of mice and other small rodents suggests that perhaps the rat population was large enough to keep smaller species away.

Elsewhere on the site, rats were only identified in the privy deposits and in the storehouse next to it (Gaulton 2009, personal communication). Hodgetts (2009) suggests that they must have been a common site along the waterfront area feeding on the fish remains from the processing activities that were going on there. Their abundance in the Mansion House deposits however, indicates that their presence was not relegated to the waterfront area but also to the residential parts of the community. Rodents can cause much damage to faunal remains from incessant gnawing. The relatively little rodent damage seen on the Mansion House faunal assemblage suggests that they must have had plenty of fodder to feed on. They may, however, have had a substantial effect on the preservation of fish remains.

Whales and Dolphins

Hodgetts (2006) identified one dolphin rib from the front door midden of the Mansion House giving the total assemblage an NISP of two. The low number suggests that these sea mammals did not play an important or regular role, if any, in the diet and foodways of the Mansion House's inhabitants. Cetaceans such as dolphins and porpoises were not uncommon in England and could be found on the menus of the English nobility in the late sixteenth century. Some recipes called for a pudding to be made from their blood and grease (Mead 1931, in Bowen and Trevarthen Andrews 2000: 8).

Fur Bearing Land Mammals

Captain Edward Wynne noted in his August 17th, 1622 letter to Calvert that there are plenty of wild animals about good for both "food and fur". Nicholas Hoskins noted in an August

18th, 1622 letter that he had hunted many foxes for their furs as well as martens and otters. Despite accounts of hunting animals for fur, very few of these species were recovered from the site. A total of 7 beaver remains were identified from four different deposits in the Mansion House whereas only 4 fox remains were identified from four different deposits in the same assemblage. Both of these species could have been hunted for both fur and food. The distribution of beaver and fox elements suggests that the entire body was brought back to the site. Foxes would have represented a danger to small livestock such as chickens and their presence in the area might have been a concern for Ferryland's residents.

Other species that could have been hunted for their furs include the marten, the otter and the lynx. The absence of these more elusive species in the assemblage may suggest a lack of trapping activities by Ferryland residents. Gaulton (2006: 160) notes that only one fox specimen was recovered from the Kirke House along with one possible spring trap fragment. He too suggests that pelts were not a big industry or a particularly sought after commodity in Ferryland.

Missing Species

Other than the American marten and the lynx, there are a couple of other mammalian species naturally found in Newfoundland noticeably missing from the Mansion House. Nicholas Hoskins noted that many bears were present in the forests of Newfoundland and that he himself had killed a few for food. It is therefore surprising to find that despite their supposed abundance and the lack of taboo towards its consumption, no bear remains have yet been recovered in Ferryland. Perhaps these creatures were not favoured by its residents or the animal's populations were not as strong as Nicholas Hoskins made it seem.

Domestic dogs and red foxes are the only canid identifications made in the Ferryland collection. The Newfoundland wolf, although now extinct (Banfield 1974), was once common in these lands and Nicholas Hoskins has described hearing them. Some faunal identifications could only be made to the level of *Canis* sp., meaning they could be either domestic dog or wolf. Therefore it is possible that some wolf is in the collection but can't be positively identified.

Domestic Dog

As mentioned, the consumption of domestic dogs (*Canis familiaris*) was not appropriate in seventeenth-century English culture and there is no evidence to suggest that dogs were consumed by people in Ferryland. Three specimens, a femur, a tibia and a thoracic vertebra were found scattered amongst some of the Mansion House's middens. Nothing suggests that these were butchered or cut up in any way. The remains of an almost complete neo-natal or foetal dog were recovered from Event 631, part of the not yet fully excavated southern most auxiliary stone structure. This individual may have been tossed aside shortly after its death although we do not yet understand the full nature of that particular deposit. Its presence on the site indicates that dogs were breeding in the community.

A complete adult dog was recovered from Event 634 amidst the rubble representing the collapse of Structure 18. Its location amid the rubble suggests that the dog was up on the second floor of the building when it collapsed. Most of its bones were recovered except for a few phalanges and lower caudal vertebrae. The animal is believed to be a female based on the absence of a baculum. It was a mid-sized dog (about the size of a Labrador retriever) and was an older adult as all of its epiphyses were fully fused with no epiphysial line visible. A bullet wound was found having punctured through its upper right tibia along with bits of embedded lead surrounding the bullet wound (Figure 23). This dog is believed to have been shot in the leg during the French attack on Ferryland on September 21st, 1696. After it was shot, it likely made its way to the top floor of Structure 18 where it either succumbed to its injuries or died when the French felled the building overtop it. This dog represents the only known victim of the French attack on Ferryland.

Figure 23: Bullet wound found on upper left tibia of a dog (*Canis familiaris*). Note the two pieces of embedded lead above the entrance wound. Photo courtesy of Barry Gaulton.

Domestic Cat

Parts of a single cat (*Felis catus*) were recovered from within the main structure of the Mansion House including elements of the skull, vertebrae and lower hind limbs. Hodgetts (2006) identified one cat specimen in her analysis of the Kirke House. The known taboo of the English towards eating cats and the lack of cut marks or disarticulation of the skeleton suggests that this cat was not for human consumption. Cats would have undoubtedly been very useful to have around the community especially considering all of the rats known to have been present at the site.

Horse

The proximal ends of both a right and a left horse (*Equus caballus*) scapula were recovered from two different deposits within the assemblage. There is no evidence to suggest that these specimens are the result of human consumption. Horses were highly valued by the English in the seventeenth century but were not an acceptable source of food (Simoons 1961: 83-84, in Miller 1984).

Seal

Seals at the Mansion House are mostly represented by harp seal (*Phoca groenlandica*) and a couple of harbour seal (*Phoca vitulina*) elements. Seals are some of the most prominent mammalian bones recovered from the Mansion House assemblage ranking fifth most common among mammals behind cow, pig, caribou and caprines. It has the fourth highest NISP in Event 632 and the second highest NISP in Event 627. However, when compared to Figure 3 of Hodgetts (2006) which places seal as the second most important group of mammals at the site, after the pig, it would appear that the role of seal within the Mansion House's deposit is not the same as elsewhere on the site.

All body parts are present within the Mansion House assemblage suggesting that the entire animal was brought to the house for processing or that all of the body portions where used in meals. Elements of the fore limb are the most numerous and are consistently found throughout the Mansion House. The age at death profiles indicate that both young and old seals were taken. Butchery marks suggest disarticulation and processing of the body for meat.

Yearling harp seals may have been primarily harvested for their beautiful white pelts rather than for their meat or blubber. Harbour seals have a year round presence on the Avalon Peninsula but are more likely to be found in the spring and summer seasons (Bonner 1994; Hodgetts 2006); whereas harp seals are only found on the ice flows off the coast during the species' annual spring migration (Hodgetts 2006: 134; Sergeant 1991). Hodgetts (2006) believes that for the residents of Ferryland, seal represented a fresh source of meat in the late spring season when all of their stores of meat were likely running low and no new source had yet become available. Wilson (1973: 35) notes that seal was relatively common in the prepared dishes of medieval England and was considered as a type of fish and often included into fish pottages for fish days (Fridays and Lent), although Hodgetts (2006: 135) indicates that seal may have at first seemed foreign to Ferryland's inhabitants.

Pig

The domestic pig (*Sus scrofa*) is one of the most common species identified in the Mansion House assemblage ranking a close second behind the domestic cow (*Bos taurus*) in terms of total NISP. Skeletal elements from every part of its body were identified suggesting the entire animal was brought to the vicinity of the Mansion House area where it was processed and/or entirely served as food. The most represented part of the pig are elements of the head, a body section that we today tend not to consider edible. Bowen (1996: 89) notes that pig heads were used in a number of recipes and they are commonly found in every seventeenth- to early nineteenth-century faunal assemblage from the Chesapeake region regardless of the socio-economic status of the household and these were used in a number of recipes.

The presence of multiple foetal or neo-natal individuals, who died before or shortly after birth, indicates that pigs were reproducing on the site. Hodgetts (2009: 11) notes that the middens she investigated primarily contained adult pigs and older juveniles whereas the privy contained a large number of foetal/neo-natal pigs and few adults. She suggests that infant pigs were disposed of in the privy and may have been intentionally killed in order to control population sizes. The need to control population sizes may be a reflection of the community's inability to provide enough food for these animals throughout the year. The presence of at least four foetal/neo-natal individuals in the middens of the Mansion House suggests that they were not only disposed of in the privy but that some may have been tossed out in the household middens. There is no evidence for their disarticulation and no butchery marks have been identified on any of these specimens further suggesting that they were not consumed by people, a remark also made by Hodgetts (2009).

All but one of the recovered pig specimens indicate an age at death before reaching approximately 36 months of age. Landon (1996: 122) notes that pigs who were raised solely for meat will show a kill-off pattern almost identical to that seen in the Ferryland assemblage where the majority of the population is killed before reaching 3 years of age with the peak slaughtering time occurring when the pigs were between 18 and 24 months of age.

Caribou

Caribou (*Rangifer tarandus*) represents the third overall most abundant species in terms of NISP in the Mansion House assemblage and was the second most abundant species in Events 613, 632 and 651. Hodgetts (2006) identified similar proportions of caribou in the other Ferryland assemblages suggesting that there was equal access to this resource and that it provided an important contribution to the diets of the community's residents. Kill-off patterns are more evenly distributed when compared to that of other ungulates in Ferryland showing a distribution of ages ranging from young calves less than six months old to adults older than 40 months. Such a pattern is not unexpected for that of a wild animal; these creatures were not kept in enclosures but were encountered in the wild where hunters could only choose from the animals which he/she came upon. The kill off data suggests that no single type of caribou (i.e., young and small or older and larger) were particularly selected.

Elements of the head and feet were under-represented but not completely absent from the Mansion House collection indicating that perhaps the entire carcass of the smaller, younger individuals were returned to the site, whereas the larger ones may have been partially processed at the kill site to remove some of the least useful body sections such as the heads and the hooves allowing for easier transport from the interior of the island to Ferryland.

Cow

Cattle (*Bos taurus*) identifications were the most abundant within the Mansion House assemblage but only slightly more so than pigs. However, when considering the size of a cow relative to that of a pig, it would appear that cattle provided a greater contribution to the diet of the Mansion House's residents. There are significantly more cattle remains in the Mansion House assemblage when compared to the rest of the site. Hodgetts (2006, 2009) notes cattle as the third most abundant species in the later seventeenth-century assemblages, placing it well behind pig and seal in terms of NISP. Despite this fact, she notes that cattle were highly prized animals and that their successful management was surely a high priority at the site (Hodgetts 2009). Elements of the upper hind limb were the most dominant in the Mansion House assemblage. However, all sections of the body were present suggesting that either the entire animal was processed in or near the vicinity of the Mansion House or that all parts of the body were served as food. As was the case for caribou, head and feet are under-represented in the deposit possibly suggesting some butchery activity took place elsewhere before transporting this large animal to the Mansion House area, which would not be too surprising considering the size of the animal and the effort involved in the transportation of an entire carcass.

Age at death profiles indicate that the majority of cattle were killed in the prime of their lives – before becoming full adults when they reach their near maximum weight without having to intake substantially more food to keep or add to that weight (Bowen 1998; 1999: 95). To be more specific, many of cattle at Ferryland were killed before reaching 36 and 48 months or three to four years of age. Trow-Smith (1957: 238-240) noted that, historically, bullocks were not ready for beefing until they reached about four to five years of age and that if cows were kept for dairying purposes, the prime age for lactation wasn't until a cow reached six years. Evidence at Ferryland would suggest that the cattle "industry" there was almost exclusively based on beefing and not dairying. Most of the cattle were killed before reaching three to four years of age meaning that most were killed before the ideal slaughtering age. Perhaps this is a reflection of the inability to keep larger animals on the farm during the winter. It is possible that a few (one or two at a time) cows were kept for personal dairying purposes but not very many according to the kill-off data.

One of the reasons for not keeping cattle past adulthood was the difficulty for Ferryland residents to produce enough winter fodder to sustain these individuals throughout the winter months. Short growing seasons and the residents' pre-occupation with the cod fishery meant that little time could be afforded to grow fodder for the winter. A victual invoice from 1639 shows that Ferryland was receiving wheat, malt, peas and oatmeal, possible evidence indicating the community could not produce enough of these crops on their own. This same invoice also indicates that cheese and butter were sent to Ferryland which suggests that the community could not produce enough dairy products on its own (Privy Council, 14 June, 1639, in Pope 1993). It was difficult for cows to produce milk if they were not given enough fodder (Bowen 1999: 100). Pope (2004: 345) notes that the most common ceramic form recovered from seventeenth-century contexts in Ferryland are the baluster shaped tall pots from North Devon in which butter was imported. He further notes that butter in the middle of the century had a bad commercial reputation with claims of over-salting, under-packing and over-weighing (Ibid., 345) thus possibly providing incentive for a household to keep its own dairy cow to produce just enough for the household's basic needs.

Based on the archaeological evidence and mostly on information from a 1677 census of the community, it would appear that the cattle population in Ferryland never fulfilled Wynne's claims that the land could support some 300 heads of cattle. Similar claims that the community would be able to support large and sundry sorts of crops were also never realized as animals needed to be culled in order to sustain winter fodder reserves.

There is no evidence for or against the presence of barrelled pork or cattle in the Mansion House assemblage. There is evidence suggesting that pigs were being raised on the site and historical documentation of cattle present on its shores but there is also the possibility that some of these remains were imported as barrelled meat products from elsewhere. Documents indicate that some residents were purchasing barrels of both these creatures from New England Merchants (Buckley 1693, in Pope 1993). Body portion analysis and butchery patterns alone cannot provide conclusive evidence as to whether or not such products are present in the assemblage.

Caprine

Sheep/goat elements are the fifth most numerous mammal specimens in the Mansion House assemblage in terms of their total NISP. They are present in some events more than others suggesting variability in the consistency of their consumption or in the consistency of their preservation but they generally rank after seal in terms of NISP except for Events 613 and 634. Its presence in the assemblage is not unlike that recorded by Hodgetts (2006, 2009). It is important to note that interpreting caprine remains as a single category makes the assumption that both sheep and goats were used towards the same purpose and consumed in the same way by the Mansion House's inhabitants. Caprine body portion representation indicates a pattern that closely resembled that of pigs. Elements of the head were the most prominent in the assemblage followed by elements of the upper fore quarter.

The sheep in Ferryland are noticeably young at their age of death. Kill-off distributions based on the timing of epiphysial fusion and tooth eruption suggest that most were culled before reaching two to three years of age. Bowen (1998: 148) states that the prime time for slaughter for caprines is between one and a half to two and a half years of age. Landon (1996: 123) notes that assemblages containing very few animals culled at a very young age suggests breeding the animals for their wool. The seventeenth-century poem presented in Chapter 3 also indicates that the best wool came when the sheep were three to four years of age. The kill off pattern at Ferryland would suggest that the vast majority of these animals were killed well before they were able to produce fine wool, some being killed before reaching six to 10 months of age, and therefore were primarily raised for their meat. It would appear the residents of

Ferryland had a taste for young lambs or kids, the meat of which was far superior to that of an adult (Thirsk 1990: 41). This pattern is in contrast to what was seen in New England in the later seventeenth century, with sheep being primarily raised for their wool products (Bowen 1998; Landon 1996).

An almost complete skeleton of a young lamb or kid was recovered from Event 634, underneath the rubble of Structure 18's collapsed second floor. No butchery marks were found on its skeleton and the nature of its deposition suggests that it was never disarticulated but rather deposited as a whole. Its location in the rubble suggests that it was located on the first floor of Structure 18 when it collapsed during the French attack of 1696. I can think of two possibilities explaining the presence of this lamb based on the archaeological evidence. The first is that amidst all of the chaos of the attack, a lamb escaped its enclosure and somehow made its way to the interior of the structure where it died when the building collapsed. Or, a more plausible explanation might be that this lamb was killed sometime shortly before the September 21st attack but the butcher never had the time to further process the carcass. It is unlikely that this lamb was simply thrown away for reasons unknown such as disease for two reasons: 1) the skeleton reflected that of a completely healthy individual; and 2) if it was just thrown into an outside midden only to fall into the structure when it collapsed, the lamb would surely have been scavenged by local dogs. It is unlikely that the individual represents a preserved food item kept in the cellar because there would likely have been some disarticulation of the creature before hand and the presence of a rotting carcass inside a house is surely not an ideal situation for anyone. The lamb was somewhere between 10 and 12 months old based on the timing of epiphysial fusion and dental eruption.

7.3 Animal Husbandry in Ferryland

The recurrent theme seen in the archaeological data from Ferryland is that domesticates such as pigs, cows and caprines were killed as soon as they reached the prime slaughtering age, the point up to which they continue to fatten themselves up and can still reproduce (Bowen 1999: 95). Some individuals were killed prior to reaching this age and there is evidence for population control among pigs. This pattern may well suggest the inability to provide enough winter fodder to sustain large herds of animals. Killing these animals while at the prime of their lives meant that, because they were still growing, they were gaining weight even if they were eating slightly less food during the winter; whereas, older individuals would be consuming more food than the younger ones during the winter but still be losing weight as they would be eating less than what they were used to in the summer. The slaughter of animals followed seasonal cycles, large animals such as older pigs and cattle were likely culled in the colder months of the late fall or winter whereas lambs and calves were typically slaughtered during the summer (Bowen 1988, 1990; Landon 1996: 123). Ferryland likely saw many domestic animals culled upon the arrival of winter, when these animals were at their fattest and before they would be in need of utilizing the winter provisions.

Hodgetts (2006: 134) notes that there could be an increase in the community's ability to produce winter fodder for their animals during the second half of the seventeenth century based on the knowledge that the climate ameliorated at this point and should have been more favourable towards a longer growing season. She notes that this may be expressed in the observed decrease of pigs and a slight increase in the percentage of cattle and caprines in the later period deposits she investigated vs. the early period deposits. This may be true to some extent as the settlers were no doubt becoming more and more familiar with the land and how to

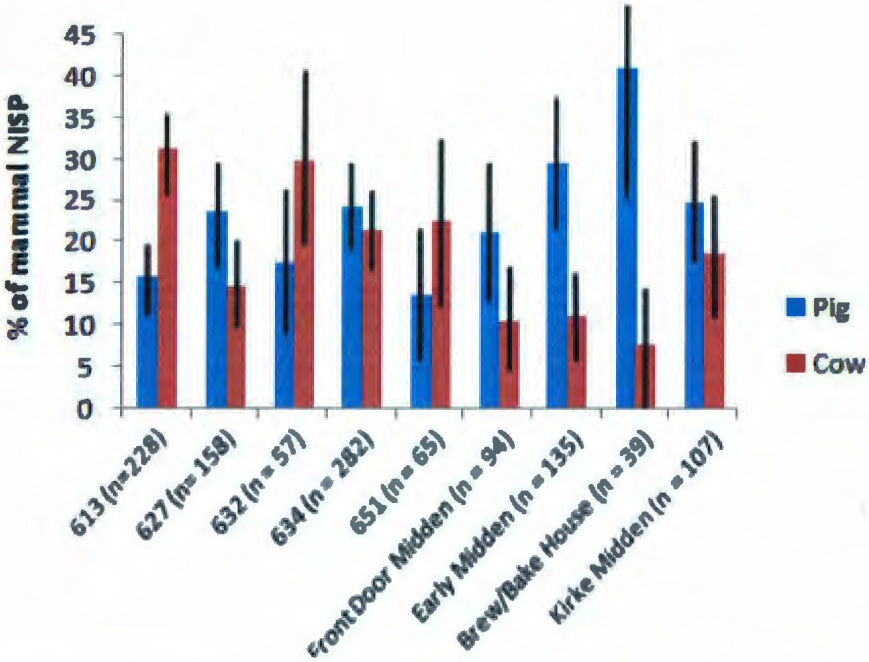

Figure 24: Distribution of pig and cow from Ferryland. Standard error bars indicate a 95% confidence interval. (Some data from Hodgetts (2006)).

successfully grow more crops in the area, but one of the two deposits she uses as a late seventeenth-century deposit is now known to be the Mansion House's front door midden. This research project has shown that many of the Mansion House deposits contain a higher number of cattle specimens than other deposits on the site (Figure 24). Furthermore, one of the Mansion House's deposits (Event 613) is dated to the first half of the seventeenth century and it shows a higher number of cattle relative to pig specimens, thus suggesting that some other factor might better explain the increased presence of cattle over pork in this area of the site. It should be noted that although the differences in the number of identified cow and pig seen in Figure 24 fall within the error margins (likely a result of small samples), the consistent presence of a greater amount of cow in many of the Mansion House deposits lends some strength to the argument that more cattle was being deposited in this area. Possible reasons for this phenomenon will soon be discussed.

In his monograph on seventeenth-century Newfoundland plantations, Pope (2004: 346) states that the number of cattle and pigs owned by some of the larger planters on the English shore was far in excess of what was needed to supply their own households with food. He suggests that the selling of livestock by-products, like butter, to fishing crews visiting the Newfoundland shore, might have been the main reason for keeping such large herds. However, this research has shown that, at least in Ferryland, animals were not raised for the by-products that they could produce but rather were raised for their meat products. Some cattle and possibly some sheep were kept for dairy and wool products but the small number of these animals kept for such purposes does not suggest the specialized production of products for a market. However, meat products may have been sold in such markets or to other residents at the site, which would explain why some of the larger planters, like members of the Kirke family, owned more animals then necessary to feed a single household.

It is unclear what type of herd management system was practiced at Ferryland. In the early seventeenth-century Jamestown settlement, Bowen (Bowen 1996; 1999 359-360) notes that both swine and cattle were left to roam free on islands or peninsulas with defensive palisades stretching across their isthmuses to protect the livestock from predators and theft by Native Americans. This did not last too long and livestock were eventually kept in more protected enclosures. It is unlikely that such a herd management system was practiced in seventeenth-century Ferryland. Although the entire community is located on a peninsula with plenty of grazing area and connected to the mainland by a single narrow passage, there is no evidence to suggest a palisade was built across the isthmus protecting the community and its livestock from any wild predators. Cattle and caprines were likely kept in large outdoor enclosures throughout the summer months to feed from the grass and bushes and pigs may have been kept in similar enclosures perhaps in areas closer to the community where they could be fed household waste and fish offal from the fishery. The presence of a byre or cow house in Area C suggests that cows, and possibly caprines were kept indoors during the winter months, where they were fed the provisioned winter fodder (Gaulton 1997: 71). It is possible, as Beaudry (1980) and Bowen (1999: 361) suggest that caprine husbandry was incorporated into cattle husbandry practices. The slight increase in the presence of caprines in the later seventeenth century noticed by Hodgetts (2006) might be the result of some type of incorporation with cattle husbandry. The mercantile nature of the Kirke occupation in Ferryland would suggest that animals were unlikely to be freely roaming about on the peninsula without any idea as to who owned which animal. Furthermore, in his 1677 census of the community, William Poole was able to allocate who owned how many animals of each species suggesting that these were separated into different enclosures according to who owned the animals.

7.4 A Note on Butchery

The body portion distribution for caprines and pigs were both quite similar with an over-representation of elements of the head followed by elements of the upper fore quarter. These shared distributions may be a reflection of the size of the animals being consumed. The pig and sheep assemblages are both quite young suggesting that the transportation of a carcass to the Mansion House area was not too difficult a task even if the animal was still whole. Bowen (1996: 119) notes that even animal parts such as heads and feet that we, today, would not consider prime cuts of meat, had their place in the cookbooks of the eighteenth century and were served on the tables of the wealthier and noblest of citizens. The higher representation of head elements in the assemblage may equally be the result of the more easily identifiable nature of cranial elements. Unlike late nineteenth-century assemblages, we cannot assign relative meat values to specific body portions as we are not privy to meat price indices from that time period (Bowen 1992: 273).

Cattle and caribou also shared similar body portion distributions each showing an under-representation of elements from the head and feet. Cattle and caribou are much larger animals and would be in need of some dismemberment prior to being transported to the Mansion House area. Caribou would have been taken in Newfoundland's interior and needed to be transported for at least a kilometre or more. Heads and feet are the body portions with less meat on them and therefore are most likely to have been left behind.

It was not until the first half of the nineteenth century that butchery techniques started to change from chopping with axe or cleaver-like tools to sawing through bone (Bowen 1992: 270). It comes as no surprise then that all of the butchery marks found in the Mansion House assemblage are chop marks left behind by axes and cleavers to disarticulate skeletons or cut marks left behind by knives or sharp blades when scratched along the surface of a bone. Notable butchery patterns present in the assemblage includes the cutting of the vertebral body transversely along a sagittal plane as if to separate the animal's carcass into a left and right half. This mark was observed on multiple specimens from seals, pigs, caribou, cattle, and from a caprine's sacrum. Bowen and Trevarthen-Andrews (2000: 94) note the exact same pattern in their analysis of early seventeenth-century deposits in Jamestown, Virginia. They also note some chopping marks made on various locations of the ribs in an effort to separate these from the vertebrae. Such marks were also present in the Mansion House deposit.

7.5 Consumption of Wild vs. Domestic Species

The analysis of the consumption of wild vs. domestic mammals suggests that residents from the Mansion House, like all other Ferryland residents, had equal access to both types of meat. This supports Hodgetts' (2006, 2009) analyses that indicated similar exploitation patterns of wild vs. domestic species throughout the seventeenth-century occupation of the site. This is contrary to what was seen in the Chesapeake region where the reclamation of forested areas and loss of habitats are attributed to patterns of increased consumption of domestic livestock rather than a continued reliance on wild resources towards the end of the seventeenth century (Bowen 1996). Miller (1984) believes that the heavier reliance on wild species in the earlier years of settlement in the region was a response to the uncertainties of life in the new colonies. A similar pattern of increased reliance on domestic livestock is seen in Jamestown throughout the seventeenth century (Bowen and Trevarthen Andrews 2000: 2-3). It should be noted however, that planters in the American colonies were interested in reclaiming the land to grow tobacco and other crops, thereby providing them with both land on which to send livestock to pasture, and on which to grow sufficient amounts of winter fodder. Planters in Ferryland were interested in the fishery and never spent any real effort throughout the seventeenth century to reclaim land and increase their livestock population numbers.

7.6 Expression of Wealth and Status in the Diet of the Mansion House Inhabitants

This section highlights the differences observed between the faunal materials recovered from the Mansion House and those recovered from other deposits in Ferryland. While not all of the observed differences present between these deposits can be explained by differential socio-economic status, it appears as though the majority of them are, while others likely relate to factors such as differential preservation or sample size biases. Interpretations of these differences are presented with reference to comparisons to contemporary English colonial contexts in North America and to the background information previously presented in this thesis. There are seven noticeable and consistent differences observed between the deposits from the Mansion House and other areas of the site. These are: 1) more favourable preservation conditions for organic materials; 2) the highest number of rat remains yet to be identified on the site; 3) a large diversity of bird species; 4) the presence of raptors; 5) the presence of birds species only found in the barrens habitat of the interior of the island; 6) a higher number of cattle specimens; 7) a diminished importance of seal.

Evidence for Greater Preservation Conditions

First, let us consider the favourable preservation conditions that seem to be unique to the Mansion House assemblage. The reason for this cannot be explained in terms of the higher socio-economic status of the Mansion House's residents but should be considered here before making any further interpretations. I cannot confirm if the reason for better preservation is because of the suspected alkalinity of the soil as a result of the presence of limestone mortar used in the construction of the Mansion House. However, I can say that more bones have been recovered from this assemblage than any other single area of the site. Prior to the excavation of the Mansion House, the only other area of the site that showed excellent preservation conditions for organic materials such as bones and textiles is the privy deposit (Hodgetts 2009). The privy may not have contained as many faunal remains as the Mansion House deposit, but then again, it was a much smaller deposit. It does share a couple of characteristics with the

Mansion House relating to the preservation of organics; they are the only two deposits with small fragile fish bones from the skull of the Atlantic herring (*Clupea harengus*) and the small fragile bones of European rodents such as rat (Hodgetts 2009). Other fully excavated residential households such as the Kirke House, excavated in Area F (Gaulton 2006) and a planter house, excavated in Area D (Crompton 2001) each contained less than 500 faunal specimens whereas the Mansion House had well over 8,000. Therefore, when making comparisons between other assemblages at the site and that of the Mansion House, we must be aware that the latter had better preservation conditions and as result, provides us with a much larger sample.

Bones from rats and mice were recovered in greater numbers in the Mansion House assemblage than from anywhere else on the site. Rats and mice were not consumed by humans in seventeenth-century Ferryland and so their presence here is not attributed to the higher socio-economic status of the building's occupants but rather a result of preferential preservation conditions and large sample size. Only twenty-four rat specimens were identified in the privy deposit previously leading to the idea that the wharf and waterfront area, where activities related to the fishery occurred, was particularly infested with rats for that very reason. The recovery of over 218 rat specimens from the Mansion House suggests that rat infestations were a problem throughout the site.

If there is only one characteristic that immediately makes the Mansion House faunal assemblage stand out above the others it is the number of different bird species found here. The sample size from the Mansion House deposit (over 1,100 bird bones) would surely have more opportunities for the identification of new species, especially considering the fact that other deposits might contain less than 100 avian remains each. When breaking down the

Mansion House's assemblage into the various deposits that comprise it, you are left with samples comparable in size to those from other areas of the site that still reveal a much greater diversity of species and taxonomic families. However, these differences are not very large and may not be statistically significant, yet the consistent trend of a wide variety of bird remains in many of the Mansion House deposits (both larger and smaller ones) warrants further investigation. The question remains: How best to explain this large diversity of birds and account for some species unique to the Mansion House deposits?

Evidence of Feasting?

Wild bird bones are generally not found in excavations of English medieval archaeological towns and villages, with the exception of high status locations, such as castles, where they are recovered regularly, suggesting that these were regarded as a luxury food (Albarella and Thomas 2002: 23). Albarella and Thomas (2002) note an increase in their consumption later in the middle ages. A review of historical texts finds that large feasts and banquets were an important part of elite social life during the medieval period. Birds were the most important part of the meal and menus read like a nature guide book's list of local species (Bowen and Trevarthen Andrews 2000: 15; Wilson 1973: 114-137). Not only were these birds present for their consumption by the banquet's attendees, but they were often beautifully and ornately presented in a life-like manner. Wheaton (1983: 16) mentions how some dishes would have the meat first roasted and then sewn back into their skins and feathers and had their beaks gilded with gold making for an impressive presentation at the table. Large and life-like eagles where often displayed as centrepieces in these elaborate food displays (Bowen 1996: 103; Wilson 1973: 336-337). Bowen and Trevarthen-Andrews (2000: 15) note that in the mid- to late-sixteenth century and throughout the seventeenth century, wild fowl were important in "high-style cuisine" and that it wasn't until the eighteenth century that seabirds and freshwater birds such as seagulls, cranes and herons became neglected in the colonial English diet. These feasting traditions were more popular in medieval times then they were in the post-medieval period but nevertheless provide a good parallel to the diversity and unique species present in the Mansion House assemblage. In the late seventeenth-century Chesapeake, the importance formerly placed on consuming a wide variety of different species was replaced with a focus on livestock prepared according to new and complex recipes (Bowen 1996: 103). If the presence of a wide variety of birds is the result of an importance placed on the diversity of consumed products, then it would appear that the trends occurring in the Chesapeake area were not yet present in Newfoundland. The fact that the diversity in species is mostly the result of the existence of many sea birds commonly found in the Ferryland area suggests the assemblage may simply be the result of a rich and diverse wildlife available to the community. However, the unique presence of particular species in the Mansion House assemblage leads to other possible explanations regarding the building's avian deposits.

The presence of large raptors such as the bald eagle, the great horned owl and the snowy owl are unique to the Mansion House assemblage. One bald eagle specimen (part of an upper leg bone) was found in one of the Mansion House's midden deposits. However, the other three specimens, which include a bone of the foot, as well as a complete mandible and skull (Figure 25) were recovered from Event 633, the fireplace deposit inside the main structure of the Mansion House. These could be the remains of centrepieces used during an elaborate feast but a review of the literature provides two more possible explanations for the presence of such striking species.

Figure 25: Skull and mandible of a bald eagle (*Hallaeetus leucocephalus*) recovered from the fireplace in the main structure of the Mansion House. Photo courtesy of Barry Gaulton.

These predatory birds may represent hunting trophies obtained over the years and properly prepared and displayed for all to see, possibly as part of a curiosity collection. A common practice in sixteenth- and seventeenth-century Britain, curiosity collecting was an activity undertaken by the middling sort and the nobility alike (Swann 2001: 5). Various objects of a sundry nature that managed to pique one's interest were collected and displayed for all to see, usually in some sort of cabinet. These cabinets could sometimes be just as unique and extravagant as the collection it was meant to display (Impey and MacGregor 1985: 1). Natural objects such animal bones and taxidermy items were often included in these collections (Swann 2001: 2). Young (2007) notes many items found in various Kirke era deposits throughout the site might suggest the presence of curiosity collecting activities. She provides a full discussion on curiosity collecting in Ferryland and notes that the bald eagle skull and mandible as well as a *terra sigillata* costrel recovered from the Mansion House are possible examples of this activity.

Hunting and the significance of wild game

The second possible explanation deals with the predatory bird's role in the hunting of small game and wildfowl. As was previously mentioned, raptors such as eagles and owls were a taboo species for the English and unacceptable for human consumption. Food history texts note that raptors were used for hunting and never to be consumed as food. Many of these birds were often trained by the English to assist in the procurement of wild fowl (Bowen and Trevarthen Andrews 2000: 15). Bowen and Trevarthen-Andrews (2000: 15) note that raptors are only present in the early- and mid-seventeenth-century assemblages in Jamestown, Virginia. After this time, guns had replaced the raptor's role in bird hunting. They state that it was very possible that bald eagles, hawks and great horned owls were trained by the Europeans in Jamestown for the purpose of falconry. The Mansion House assemblage primarily dates to the second half of the century, when guns were already in use for the purpose of bird hunting. I suspect that the efforts involved in first capturing and training a predatory bird were too great and did not warrant the time spent on the matter when similar results could be obtained with a gun. It is nonetheless possible that they were used in a manner previously described in Chapter 3 whereby they were released on a string to fly over the hunter's prey so that the latter would be unwilling to take off in flight and therefore be an easier target for the hunter with a gun.

The willow ptarmigan (*Lagopus lagopus*) is another species that is only found in the Mansion House and not in any other domestic/residential deposit. One specimen was recovered from the privy. The relatively high number of bones recovered from the Mansion House assemblage suggests that this species played some role in the diet of the building's occupants, but was not as important as sea birds and ducks. What makes the unique presence of ptarmigan in the Mansion House so interesting is that this bird's primary habitat is the barren lands of the island's interior (Montevecchi and Tuck 1987). The presence of this bird on the Ferryland Peninsula or even on the island's coast is quite unlikely and therefore travel into the interior of the island would have been necessary to hunt for these birds. As was mentioned in the previous chapter, the sport of hunting in seventeenth-century England was restricted to members of the upper classes. Could the presence of willow ptarmigan, a wild fowl not found on the Ferryland Peninsula, be attributed to hunting privileges uniquely given to the gentry in Ferryland? That is very unlikely, as the presence of caribou, another animal that resides in the barren lands of the island's interior, is not unique to the Mansion House deposits. Caribou is decidedly present in all of the other analyzed deposits in Ferryland and seems to have equally contributed to the diet of all of the community's inhabitants.

Hodgetts (2006: 136) mentions that the move to Newfoundland for individuals of the middling and lower social class meant an improvement in terms of access to meats with greater "social value" as the restriction imposed on them with regards to deer hunting rights and access to venison was absent in Newfoundland, where it appears all were allowed to hunt or eat wild animals. This is in stark contrast to what was observed in contemporary assemblages from the Chesapeake area. Bowen (1996: 100) and Miller (1988: 186) both found a difference in terms of venison consumption between the wealthier homes and those of the middling sort. Both attribute this to the ability of the wealthy to hire Native Americans or professional hunters to supply them with such a product. The employment of professionals to retrieve wild game for Ferryland's wealthiest residents is an alternative possibility to the occupants of the Mansion House going about it themselves.

A focus on Livestock

Another striking difference between the Mansion House deposit and other assemblages in Ferryland deals with the significant increase in the importance of cattle. It is clear that residents of the building were consuming more of this animal than other residents at the site who consumed more pig than they did cow. It should be noted that for the Mansion House assemblage, the relative importance of beef to pork and the relative importance of caribou to seal have increased compared to other deposits at the site. In order to be eating more cattle, the residents of the Mansion House must have had greater access to these animals. In a market situation, this would easily be attributed to a higher level of wealth, being able to afford more cuts of beef. However, Ferryland's residents needed to be as self-reliant as possible when it came to providing their own meat and therefore, a higher access to one particular type of meat would be reflective of ownership of livestock. A 1677 census of Ferryland shows that only a select few wealthy planters owned large numbers of cattle whereas pigs were owned by most residents (Poole 1677 in Pope 1993). Large numbers of pigs were also owned by the younger David Kirke in 1677 and Pope (2004: 345) suggests that this was an obvious commercial venture for the former governor's son. The larger ownership of cattle may relate to owning more land on which to send them to pasture and from which to grow crops to feed them for the winter. The wealthy planters of the Mansion House would have needed money to hire labourers to tend to their animals and crops and likely owned stables or byres in which to keep their animals for the winter.

A similar pattern of cattle and pork consumption is present in the contemporary Chesapeake assemblages. Swine ownership in the 1640s was almost universal and then dropped to approximately 80 percent of the households by the end of the century (Miller 1988: 178-179).

Comparatively, the number of households that owned cattle was quite low in the 1640s. Cattle populations grew and by the end of the century, more households owned cattle then swine (Miller 1988: 178-179). Both Bowen (1990, 1996, 1998) and Miller (1988) found that wealthier households consumed greater quantities of cattle when compared to households of lower socio-economic status. Bowen (1996: 111-112) attributes this to the fact that the land-owning planters were also the wealthiest planters and by the eighteenth century, when lands were becoming increasingly scarce and community populations grew, those who owned the land had space to keep larger herds whereas the tenants of those lands had less space to keep herds of their own.

How the Cod Fishery Shaped the Human Diet

Various other scenarios attempting to explain the differences between the Mansion House assemblage and those from other areas of the site can further be proposed. However, it is important to understand more than just *what* these differences are and ask ourselves *why* they occurred. Only after considering the documentary evidence, the social, cultural and economic contexts of the site, can we really decide on how best to interpret the results from the faunal analysis. The basic principles of consumption theory hold that people express themselves through the items they choose to consume but the availability of those items and the choices that are made available to the consumer can be affected by other circumstances. In her study of the earliest years of English settlement in Jamestown, Bowen (1999: 359) interprets faunal data based on the fact that early colonists focused most if not all of their commercial interests on the production of tobacco and other crops, dismissing tasks such as the herding of livestock to merely "a subsistence-related activity". The early situation in Jamestown is not unlike that in Ferryland during the seventeenth century. The primary economic focus throughout that time period was the cod fishery, planters did not own land and grow crops, they owned boats and went fishing. All of the differences observed between the Mansion House assemblage and other areas of the site can be explained in terms of the extent to which the individuals who created these deposits were involved in the fishery. Due to the lack of a continuously re-stocked food market in the community, wealthy consumers in Ferryland were not free to continuously purchase and consume preferred cuts or varieties of meats. Therefore the question becomes: Were they able to express their higher socio-economic status through the foods they ate when everybody could grow their own grains and vegetables and raise their own livestock? Hodgetts (2006: 135) first proposed that while the fishery was the "*main* focus for the wealthy planter, it was the *exclusive* focus for the poorer ones". This last statement helps guide the answer to the previous question. Wealthy planters were not entirely pre-occupied with the fishery as they could afford to hire more servants to man their boats whereas the poorer planters needed to go out with their vessels themselves (Pope 2004: 263-264). The wealthy planter had more *time* to spend performing tasks unrelated to the fishery and more money to spend on servants to perform similar duties. The wealthy Ferryland planter/merchant was also well connected with other merchants in Ferryland and other parts of British North America and had greater access to and better abilities to procure provisions such as salted meat products.

The greater consumption levels of cattle are a reflection of this extra time and money to work on things unrelated to the fishery. Essentially, the residents of the Mansion House ate more beef because they owned more cattle. The 1677 census of the community confirms that only a select few of the wealthy planters owned large numbers of cattle. Such large herds required their owners to gather enough fodder to feed them throughout the long winters. These fodder crops would have required attention during the spring, summer and fall seasons and hence require the planter or his/her employees to spend time away from the cod fishery which would have cost their bottom line. The greater consumption of cattle did not come at the expense of a decreased consumption in swine or other foods. Census records indicate that larger herds of swine were equally owned by wealthy planters at the site. As Pope (2004: 345) suggests, the higher number of livestock may relate to commercialization of their meat products for sale within the community and to migratory fishing vessels.

The unique presence of willow ptarmigan and raptor species found in the Mansion House assemblage can also relate to the extra amounts of time afforded to the wealthy planters. A six to eight kilometre trip was required to reach the Barrens, the primary habitat of the willow ptarmigan. Although the distance could easily be walked in a day, quite a few ptarmigan would need to be obtained to make it worth the energy spent to retrieve them. One possibility is that hunting wildfowl was more of a leisure activity rather than necessary subsistence procurement. According to the distribution of faunal remains, all Ferryland residents had access to caribou, another species found in the Barrens. However, the amount of meat that a single caribou can provide justifies the distance traveled to obtain the animal. Horses would have been a plus if not an essential part of these trips. The 1677 survey indicates that there were ten horses on the site and that these were owned by two of the Kirke sons. Horses were another animal that required care and winter provisioning, their unique ownership by members of the gentry in Ferryland suggests that they were the only ones who had the ability to keep them. Sample size and differential preservation conditions in other areas of the site might also explain this phenomenon.

Miller (1979; 1984) and Bowen (1996) both note that despite the fact that social stratification between the rich and the poor had become more pronounced by the end of the seventeenth century, the archaeological deposits relating to the diets of middling and wealthy planters were very similar. Both consumed the same variety of species and in approximately the same amounts. This research has shown that some difference may be observed regarding the diet and foodways of a wealthy planter's household vs. other deposits in Ferryland. It managed to identify the diet and foodways of the residents of the Mansion House and relate some aspect of their consumption patterns to their believed higher socio-economic status. The results from this research cannot be taken as a generalization of the diets and foodways of all wealthy planters in Ferryland as it did not share characteristics with the deposit from the Kirke House (although this may relate to differential preservation). Both the Mansion House assemblage and the deposits associated with middling planters show the consumption of the same species. No single deposit at the site can be analyzed and then placed into a category of "wealthy planter" or "middling planter" based on various characteristics of its faunal assemblage alone. However, as a whole, the Mansion House assemblage does show differences from other deposits on the site. The interpretation of the data stresses the need to examine each assemblage according to the social, environmental, economic and cultural conditions experienced by the people who created the deposits.

In terms of our knowledge of the general foodways of Ferryland, this research supports the work done by Hodgetts (2006, 2009) indicating a diet primarily focused on the consumption of swine, cattle, seal, caribou, caprines and, of course, with an important contribution from the Atlantic cod.

Chapter 8: Conclusion

8.1 Research Results

The main research goal of this project was to analyze the faunal remains recovered from the Mansion House deposits and to identify and describe the diet and foodways of those who occupied the structure with comparison to other seventeenth-century deposits in Ferryland. Research questions set out in Chapter 1 served as a series of steps to objectively guide this research towards its ultimate goal. Chapters 2 to 5 provided the relevant background information pertaining to the site's ecology, archaeology and history as well as information on pertinent research, theoretical approaches and methodological procedures. Chapter 6 presented the results of the faunal analysis and in effect, provided the answer to the first research question. The penultimate chapter discussed and interpreted those results in relation to the relevant background information. This final chapter presents a summary of the conclusions reached in Chapter 7 and begins with a summary of answers for each one of the research questions posed at the beginning of this research.

1. **What are the characteristics of the Mansion House faunal assemblage?**

The results of the faunal analysis are presented through various tables, charts and figures in Chapter 6. Appendix I provides the detailed specimen count for each archaeological event analyzed by the author. A wide range of species were found, most of which were already recorded in the Ferryland collection by Hodgetts (2006, 2009). The results were described according to number of species identifications, body distribution analyses, age at death profiles, butchery patterns and the presence of taphonomic markers.

2. **What can the faunal data tell us about the diet and foodways of the Mansion House's inhabitants?**

The residents of the Mansion House had a diet primarily focused on the consumption of mammals and fish. Wild birds were less important in the diet but still regularly consumed in a significant amount. Beef and pork were important in their diet as were regular provisions of Atlantic cod, caribou, seal and caprines. Wild sea birds represent the most consumed avian species whereas wild and domestic fowl have a notable presence in the diet of the residents. The livestock kept at the site were raised primarily for their meat and not the by-products that they could produce. The general dietary trends are similar to those described in Hodgetts (2006, 2009) whereby domestic and hunting strategies were scheduled around the fishing industry to take maximum advantage of the wild and domestic foods that were available to them.

3. **How does the Mansion House faunal assemblage compare to those from other areas of the site as described in Hodgetts (2006, 2009)?**

The various animal bone deposits that make up the Mansion House faunal assemblage commonly differed from other faunal assemblages at the site in a number of ways including: a greater diversity of bird species, the presence of raptors, the presence of ptarmigan, greater numbers of cattle relative to swine, seals, caribou and caprines, more favourable preservation conditions and an incredible number of rat remains yet to be matched anywhere else on the site.

4. **Can any of the observed differences between the Mansion House assemblage and those from other areas of the site be a reflection of the higher socio-economic status of its residents? If not, how best can we explain these differences?**

Some of these differences are attributed to the higher socio-economic status of the Mansion House's residents while others are not. The large sample size, the presence of a high number of rat bones and fish species uncommonly found in other areas of the site are best explained by the presence of superior preservation conditions in the Mansion House area. The greater importance of beef in the diet, the larger diversity of bird species, and the presence of raptors and wild fowl are all associated with the higher socio-economic status of the building's occupants. These differences are not the result of greater purchasing powers by the wealthy planter. They are better explained by the extent of the wealthy planter's direct physical involvement in the fishery, providing him/her with more time and resources to spend on other activities unrelated to the fishery; such as cattle and swine husbandry, crop management, tending to horses and hunting. Wealthy planters also had the fortunate option of hiring others to perform these activities.

8.2 Summary of the Interpretation

This research has supported previous interpretations regarding the general diet and foodways of Ferryland's inhabitants as described by Hodgetts (2006, 2009). In general, the food consumption patterns of all Ferryland residents were circumscribed by the cod fishery and, to a lesser extent, by the local climatic conditions. The presence of the fishery as the economic engine of the community meant that most residents were there for one reason and one reason only, to produce salt cod. The intense summer schedule of the fishery meant that little or no time could be spent tending to livestock. The coinciding of the summer fishery with the short growing season meant that little or no time could be spent on the management of large crops. The inability of the community to produce enough winter fodder to feed large herds of livestock meant that cattle, pig and sheep populations needed to be controlled wisely so as to allow for a maximum number of healthy, growing animals to survive on the limited supply of food.

Seventeenth-century Ferryland was supplied with the necessary victuals from England and other parts of British North America whenever necessary, but seemed to be self sufficient in terms of its ability to produce and obtain its own meat products and practiced a subsistence strategy that took advantage of both wild and domestic resources as they became available, so long as these activities did not interfere with the cod fishery (Hodgetts 2006). They could feed on fresh cod in the summer and on wild caribou and livestock in the fall and winter. Salt cod reserves could help them get through the late winter and early spring period whereas the migrating seal population provided fresh meat in the spring. A variety of birds were available to them throughout the year. Money does not seem to be an issue limiting access to food at Ferryland as all residents seem to have had equal access to both livestock and wild game. The limitations imposed on the middling and lower classes in England with regards to the consumption of wild animals were not the case in Ferryland. Nevertheless, differences in food consumption patterns were noticeable after the comparison of a high status deposit to those from other areas of the site.

The residents of the Mansion House in the second half of the seventeenth century were some of the wealthier planters living in Ferryland at that time. The lack of a readily stocked market may have prevented them from using their money to simply purchase larger quantities of meat or their preferred cuts and varieties. They were limited by the choices made available to them on the Avalon Peninsula. One luxury that the wealthy planters did possess over the poorer ones was that of extra time and money to spend on resources unrelated to the fishery. The proprietors of the Mansion House likely were not directly involved in the cod fishery themselves, rather, they owned the boats and hired the people who caught and processed their fish. They therefore had more time to go out into the interior of the island perhaps with their dogs and horses, to indulge in the gentleman's pursuit of hunting wildfowl and perhaps, large trophy birds such as eagles and owls. They also had more money to hire servants who could busy themselves tending to crops and larger herds of cattle and caprines, therefore providing themselves with more beef and possibly the opportunity to sell some of this meat to other planters and migratory fishermen.

8.3 Future Research Directions

This project took advantage of the unique conditions afforded to us by the abundance and wonderfully preserved conditions of the faunal materials and their association with a clearly defined, high socio-economic status deposit. The importance of this analysis is further stressed considering the relatively poor faunal preservation in other domestic areas of the site. The project has brought a better understanding to the study of dietary patterns and foodways in Ferryland, the lifestyle of some of the site's wealthier planters, as well as information about the Mansion House, its organization and its inhabitants.

Further research opportunities exist that could enhance our knowledge regarding all three of these topics. A study of the ceramics and other artefacts recovered from the Mansion Houses deposits may help us understand the consumption patterns of its residents and learn more about their identity. Further study of the archaeology of the Mansion House complex as well as its related artefacts can teach us more about the functional organization of the space. If the preservation of botanical remains was equally protected against destructive taphonomic processes, then information obtained from their analysis may provide us with better knowledge of human foodways regarding grains and other plant products.

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Appendix I – Species Summaries

Event 613 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Osteichthyes sp.	Indeterminate fish	234	52.2	
Clupea harengus	Atlantic herring	2	0.4	1
Gadidae sp.	Cod family	205	45.8	3
Gadus morhua	Atlantic cod	9	2.0	3
Total fish		**448**	**100.4**	
Aves sp.	Indeterminate bird	25	16.3	
	Large bird	1	0.7	
	Medium to large bird	41	26.8	
	Medium bird	22	14.4	
Gavia stellata	Red-throated loon	4	2.6	2
Anserinae sp.	Geese sub-family	5	3.3	
Anser anser	Domestic goose	3	2.0	1
Anatinae sp.	Ducks sub-family	10	6.5	
Anas rubripes	American black duck	1	0.7	1
Anas acuta	Northern pintail duck	1	0.7	1
Clangula hyemalis	Long-tailed duck	3	2.0	1
Somateria sp.	Eider	2	1.3	
Somateria mollissima	Common eider	4	2.6	2
Lagopus lagopus	Willow ptarmigan	6	3.9	2
Gallus gallus	Domestic chicken	1	0.7	1
Scolopacidae sp.	Woodcock and sandpiper famil	1	0.7	
Larinae sp.	Gulls and terns	2	1.3	
Larus sp.	*Larus* genus	1	0.7	
Larus marinus	Great black-backed gull	6	3.9	1
Larus argentatus	Herring gull	4	2.6	1
Larus delawarensis	Ringed-bill gull	1	0.7	1
Sterna paradisaea	Arctic tern	1	0.7	1
Pinguinis impennis	Great auk	1	0.7	1
Uria aalge	Common murre	1	0.7	1
Bubo virginianus/ Bubo scandiacus	Great horned owl/ Snowy owl	1	0.7	1
Passeriformes sp.	Perching birds order	1	0.7	1
Corvus corax	Common raven	4	2.6	1
Total bird		**153**	**100.0**	

Continued...

...Event 613 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Mammalia sp.	Indeterminate mammal	243	36.1	
	Large mammal	21	3.1	
	Medium to large mammal	151	22.4	
	Medium mammal	25	3.7	
	Small to medium mammal	3	0.4	
Muroidea sp.	Mice and rats superfamily	2	0.3	
Mus musculus	House mouse	1	0.1	1
Castor canadensis	American beaver	1	0.1	1
Phocidae sp.	True seals family	7	1.0	
Phoca vitulina	Harbour seal	1	0.1	1
Phoca groenlandica	Harp seal	1	0.1	1
Vulpes vulpes	Red fox	1	0.1	1
Artiodactyla sp.	Even-toed ungulates	33	4.9	
Sus scrofa	Domestic pig	36	5.3	3
Rangifer tarandus	Caribou	46	6.8	2
Bos taurus	Domestic cow	71	10.5	1
Caprinae sp.	sheep/goat sub-family	27	4.0	3
Caprine size	Sheep/goat sized	2	0.3	
Equus caballus	Domestic horse	1	0.1	1
Total mammal		**673**	**100.0**	
Indeterminate class		**39**	**100.0**	

Event 626 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Osteichthyes sp.	Indeterminate fish	1	1.6	
Gadidae sp.	Cod family	60	96.8	
Gadus morhua	Atlantic cod	1	1.6	1
Total Fish		**62**	**100.0**	
Aves sp.	Indeterminate bird	1	25.0	
	Medium to large bird	2	50.0	
	Small bird	1	25.0	
Total Bird		**4**	**100.0**	
Mammalia sp.	Indeterminate mammal	16	45.7	
	Medium to large mammal	4	11.4	
	Medium mammal	4	11.4	
Phocidae sp.	True seals family	1	2.9	
Phoca groenlandica	Harp seal	6	17.1	1
Artiodactyla sp.	Even-toed ungulates	1	2.9	
Sus scrofa	Domestic pig	3	8.6	1
Total Mammal		**35**	**100.0**	
Indeterminate class		**2**	**100.0**	

Event 627 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Bivalvia sp.		1	100.0	
Osteichthyes sp.	Indeterminate fish	170	62.0	
Clupea harengus	Atlantic herring	1	0.4	1
Gadidae sp.	Cod family	90	32.8	
Gadus morhua	Atlantic cod	10	3.6	2
Liopsetta glacialis	Arctic flounder	2	0.7	1
Salmonidae	Salmon and trout family	1	0.4	
Total Fish		**274**	**100.0**	
Aves sp.	Indeterminate bird	15	16.3	
	Large bird	1	1.1	
	Medium to large bird	18	19.6	
	Medium bird	22	23.9	
	Small to medium bird	1	1.1	
	Small bird	1	1.1	
Anatidae sp.	Ducks and Geese	1	1.1	
Anatinae sp.	Ducks subfamily	4	4.3	
Clangula hyemalis	Long-tailed duck	1	1.1	1
Somateria sp.	Eider species	1	1.1	
Somateria mollissima	Common eider	3	3.3	1
Melanitta deglandi	White-winged scoter	1	1.1	1
Lagopus lagopus	Willow ptarmigan	3	3.3	1
Meleagris gallopavo	Wild turkey	1	1.1	1
Gallus gallus	Domestic chicken	2	2.2	1
Actitis macularia	Spotted sandpiper	1	1.1	1
Larinae sp.	Gulls and terns	3	3.3	
Larus sp.	Larus species	1	1.1	
Larus marinus	Great black-backed gull	3	3.3	1
Larus argentatus	Herring gull	1	1.1	1
Larus delawarensis	Ringed-billed gull	2	2.2	1
Pinguinus impennis	Great auk	2	2.2	1
Uria/Alca sp.	Murres/razorbills	1	1.1	
Uria aalge	Common murre	1	1.1	1
Corvus corax	Common raven	2	2.2	1
Total Bird		**92**	**100.0**	

Continued...

...Event 627 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Mammalia sp.	Indeterminate mammal	118	33.6	
	Large mammal	13	3.7	
	Medium to large mammal	28	8.0	
	Medium mammal	13	3.7	
	Small mammal	21	6.0	
Muroidea sp.	Rats and mice	1	0.3	
Rattus sp.	Rats genus	23	6.6	2
Castor canadensis	American beaver	2	0.6	1
Felis catus	Domestic cat	18	5.1	1
Canidae sp.	Canids	2	0.6	
Canis familiaris	Domestic dog	2	0.6	1
Phocidae sp.	True seals family	14	4.0	
Phoca groenlandica	Harp seal	8	2.3	2
Artiodactyla sp.	Even-toed ungulates	8	2.3	
Sus scrofa	Domestic pig	32	9.1	2
Rangifer tarandus	Caribou	20	5.7	2
Bovidae sp.	Cattle, sheep and goats	2	0.6	
Bos taurus	Domestic cow	20	5.7	2
Caprinae sp.	Sheep/goat	6	1.7	2
Caprine size	Sheep/goat size	1	0.3	
Total mammal		**351**	**100.0**	
Indeterminate class		**1**	**100.0**	

Event 630 -- Species Summary

Scientific name	Common name	NISP	%NISP	MNI
Osteichthyes sp.	Indeterminate fish	7	58.3	
Gadidae sp.	Cod family	5	41.7	
Total Fish		12	100.0	
Aves sp.	Indeterminate bird	2	50.0	
	Small bird	1	25.0	
Scolopacidae sp.	Woodcocks and sandpiper	1	25.0	
Total bird		**4**	**100.0**	
Mammal sp.	Indeterminate mammal	1	100.0	
Total mammal		**1**	**100.0**	

Event 631 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Osteichthyes sp.	Indeterminate fish	2	22.2	
Gadidae sp.	Cod family	1	11.1	
Gadus morhua	Atlantic cod	6	66.7	3
Total Fish		**9**	**100.0**	
Mammalia sp.	Medium mammal	1	2.1	
	Small mammal	36	75.0	
Canis familaris	Domestic dog	11	22.9	1
Total Mammal		**48**	**100.0**	

Event 630/631 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Gadidae sp.	Cod family	2	100.0	
Total Fish		**2**	**100.0**	
Aves sp.	Medium to large bird	1	100.0	
Total Bird		**1**	**100.0**	
Mammal sp.	Indeterminate mammal	6	50.0	
	Large mammal	1	8.3	
Sus scrofa	Domestic pig	2	16.7	1
Rangifer tarandus	Caribou	3	25.0	1
Total Mammal		**12**	**100.0**	

Event 632 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Bivalvia sp.		**1**	**100.0**	
Osteichthyes sp.	Indeterminate fish	52	46.8	
Gadidae sp.	Cod family	53	47.7	3
Gadus morhua	Atlantic cod	6	5.4	1
Total fish		**111**	**100.0**	
Aves sp.	Indeterminate bird	50	56.2	
	Medium to large bird	7	7.9	
	Medium bird	4	4.5	
	Small bird	1	1.1	
Anatidae sp.	Ducks and geese	1	1.1	
Anatinae sp.	Ducks sub-family	1	1.1	
Somateria mollissima	Common eider	1	1.1	1
Lagopus lagopus	Willow ptarmigan	1	1.1	1
Larinae sp.	Gulls and terns	3	3.4	
Larus sp.	Larus genus	1	1.1	
Pinguinus impennis	Great auk	1	1.1	1
Uria/Alca sp.	Murre and razorbills	15	16.9	
Uria aalge	Common murre	3	3.4	1
Total Birds		**89**	**100.0**	
Mammalia sp.	Indeterminate mammal	64	43.2	
	Large mammal	6	4.1	
	Medium to large mammal	13	8.8	
	Medium mammal	5	3.4	
	Small to medium mammal	3	2.0	
Leporidae sp.	Rabbits and hares	1	0.7	
Canidae sp.	Wolves, dogs and foxes	1	0.7	
Canis sp.	Wolves and dogs	1	0.7	
Canis familiaris	Domestic dog	1	0.7	1
Vulpes vulpes	Red fox	1	0.7	1
Phocidae sp.	True seals family	3	2.0	
Phoca groenlandica	Harp seal	1	0.7	1
Artiodactyla sp.	Even-toed ungulates	4	2.7	
Sus scrofa	Domestic pig	10	6.8	2

Continued...

...Event 632 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Rangifer tarandus	Caribou	13	8.8	2
Bos taurus	Domestic cow	17	11.5	2
Caprinae sp.	Sheep/goats	3	2.0	1
Equus caballus	Horse	1	0.7	1
Total Mammal		**148**	**100.0**	
Indeterminate class		**2**	**100.0**	

Event 633 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Bivalvia sp.		**1**	**100.0**	
Gastropoda sp.		**1**	**100.0**	
Osteichthyes sp.	Indeterminate fish	9	40.9	
Gadidae sp.	Cod family	11	50.0	
Gadus morhua	Atlantic cod	2	9.1	1
Total Fish		**22**	**100.0**	
Aves sp.	Indeterminate bird	15	53.6	
	Medium to large bird	2	7.1	
	Medium bird	4	14.3	
Anatinae sp.	Duck sub-family	2	7.1	
Haelietus leucocephalus	Bald eagle	1	3.6	1
Lagopus lagopus	Willow ptarmigan	1	3.6	1
Gallus gallus	Domestic chicken	1	3.6	1
Larinae sp.	Gulls and terns	1	3.6	1
Columba livia	Domestic pigeon	1	3.6	1
Total Birds		**28**	**100.0**	
Mammalia sp.	Indeterminate mammal	5	27.8	
	Large mammal	1	5.6	
	Medium to large mammal	2	11.1	
Rattus sp.	Rats genus	1	5.6	1
Phoca vitulina	Harbour seal	1	5.6	1
Artiodactyla sp.	Even-toed ungulates	1	5.6	
Sus scrofa	Domestic pig	2	11.1	1
Rangifer tarandus	Caribou	5	27.8	1
Total Mammal		**18**	**100.0**	

Event 634 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Bivalvia sp.		**11**	**100.0**	
Osteichthyes sp.	Indeterminate fish	1508	65.6	
Clupea harengus	Atlantic Herring	2	0.1	2
	Herring/Salmon	1	0.0	
Gadidae sp.	Cod family	721	31.3	
Gadus morhua	Atlantic cod	66	2.9	14
Pleuronectidae sp.	Flounders	2	0.1	
Total Fish		**2300**	**100.0**	
Aves sp.	Indeterminate bird	174	27.8	
	Large bird	4	0.6	
	Medium to large bird	127	20.3	
	Medium bird	159	25.4	
	Small to medium bird	9	1.4	
	Small bird	23	3.7	
Phalacrocoracidae sp.	Cormorants	2	0.3	
Anatidae sp.	Ducks and geese family	3	0.5	
Anserinae sp.	Geese sub-family	1	0.2	
Anatinae sp.	Duck sub-family	32	5.1	
Somateria sp.	Eider	1	0.2	
Somateria mollissima	Common eider	6	1.0	2
Somateria Spectabilis	King eider	1	0.2	1
Galliformes sp.	Pheasants order	4	0.6	
lagopus sp.	Ptarmigan species	2	0.3	
Lagopus lagopus	Willow ptarmigan	20	3.2	5
Gallus gallus	Domestic chicken	7	1.1	2
Scolopacidae sp.	Woodcocks and sandpipers	3	0.5	
Actitis macularia	Spotted sandpiper	1	0.2	1
Larinae sp.	Gulls and terns	5	0.8	
Larus sp.	Larus genus	2	0.3	
Larus marinus	Great black-backed gull	6	1.0	1
Larus argentatus	Herring gull	9	1.4	2
Larus delawarensis	Ring-billed gull	1	0.2	1
Rissa tridactyla	Black-legged kittiwake	1	0.2	1
Alcidae sp.	Auk family	2	0.3	

Continued...

...Event 634 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Pinguinus impennis	Great auk	1	0.2	1
Uria/Alca sp.	Murres/razorbills	3	0.5	
Uria aalge	Common murre	1	0.2	1
Cephus grylle	Black guillemot	10	1.6	2
Passeriformes sp.	Perching birds order	3	0.5	
Columba livia	Domestic pigeon	2	0.3	1
Bubo scandiacus	Snowy owl	1	0.2	1
Total Bird		**626**	**100.0**	
Mammalia sp.	Indeterminate mammal	237	12.4	
	Large mammal	46	2.4	
	Medium to large mammal	667	35.0	
	Medium mammal	104	5.5	
	Small to medium mammal	11	0.6	
	Small mammal	27	1.4	
Muroidea sp.	Rats and mice superfamily	21	1.1	
Mus musculus	House mouse	1	0.1	1
Rattus sp.	Rats genus	170	8.9	10
Castor canadensis	American beaver	1	0.1	1
Carnivora sp.	Carnivore order	1	0.1	
Cetacea sp.	Whale and dolphin family	1	0.1	
Canidae sp.	Wolves, dogs and foxes	10	0.5	
Canis familiaris	Domestic dog	165	8.7	1
Vulpes vulpes	Red fox	1	0.1	1
Phocidae sp.	True seals family	22	1.2	
Artiodactyla sp.	Even-toed ungulates	36	1.9	
Sus scrofa	Domestic pig	69	3.6	3
Rangifer tarandus	Caribou	35	1.8	3
Bovidae sp.	Cow, sheep, goat family	1	0.1	
Bos taurus	Domestic cow	61	3.2	2
*Caprinae sp.	Sheep/goat	219	11.5	4
Caprine size		1	0.1	
Total mammal		**1907**	**100.0**	
Indeterminate Class		**66**	**100.0**	

* Includes a nearly complete individual with NISP = 175

Event 636 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Aves sp.	Large bird	1	50.0	
Larus marinus	Great black-backed gull	1	50.0	1
Total Bird		**2**	**100.0**	
Mammalia sp.	Large mammal	2	20.0	
	Medium to large mammal	3	30.0	
Sus scrofa	Domestic pig	1	10.0	1
Rangifer tarandus	Caribou	2	20.0	1
Bos taurus	Domestic cow	1	10.0	1
Caprinea sp.	Sheep/goat	1	10.0	1
Total Mammal		**10**	**100.0**	

Event 651 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Gastropoda sp.		**1**	**100**	
Bivalvia sp.		**1**	**100**	
Osteichthyes sp.	Indeterminate fish	20	22.2	
Clupea harengus	Atlantic herring	3	3.3	1
Gadidae sp.	Cod familiy	61	67.8	
Gadus morhua	Atlantic cod	6	6.7	2
Total Fish		**90**	**100.0**	
Aves sp.	Indeterminate bird	20	25.6	
	Medium to large bird	19	24.4	
	Medium bird	11	14.1	
Gavia immer	Common loon	1	1.3	1
Anatidae sp.	Ducks and geese family	1	1.3	
Anserinae sp.	Geese sub-family	2	2.6	
Anatinae sp.	Ducks sub-family	5	6.4	
Somateria mollissima	Common eider	1	1.3	1
Lagopus sp.	Ptarmigan species	1	1.3	
Lagopus lagopus	Willow ptarmigan	2	2.6	1
Gallus gallus	Domestic chicken	1	1.3	1
Actitis macularia	Spotted sandpiper	1	1.3	1
Larinae sp.	Gulls and terns	1	1.3	
Larus sp.	Larus genus	1	1.3	
Larus hyperboreus	Glaucous gull	1	1.3	1
Larus marinus	Great black-backed gull	5	6.4	1
Larus argentatus	Herring gull	1	1.3	1
Rissa tridactyla	Black-legged kittiwake	2	2.6	1
Uria aalge	Common murre	1	1.3	1
Cepphus grylle	Black guillemot	1	1.3	1
Total Bird		**78**	**100.0**	

Continued...

...Event 651 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Mammalia sp.	Indeterminate mammal	59	29.2	
	Large mammal	10	5.0	
	Medium to large mammal	34	16.8	
	Medium mammal	6	3.0	
	Small mammal	2	1.0	
Muroidea sp.	Rats and mice superfamily	2	1.0	
Rattus sp.	Rats genus	23	11.4	3
Castor canadensis	American beaver	3	1.5	1
Vulpes vulpes	Red fox	1	0.5	1
Phocidae sp.	True seals family	4	2.0	
Phoca groenlandica	Harp seal	1	0.5	1
Artiodactyla sp.	Even-toed ungulates	17	8.4	
Sus scrofa	Domestic pig	9	4.5	2
Rangifer tarandus	Caribou	10	5.0	2
Bos taurus	Domestic cow	15	7.4	1
Cow size		1	0.5	
Caprinae sp.	Sheep/goat	5	2.5	2
Total Mammal		**202**	**100.0**	
Indeterminate class		**5**	**100.0**	

Event 652 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Osteichthyes sp.	Indeterminate Fish	37	69.8	
Gadidae sp.	Cod family	12	22.6	2
Gadus morhua	Atlantic cod	4	7.5	1
Total Fish		**53**	**100.0**	
Aves sp.	Indeterminate bird	3	17.6	
	Medium to large bird	4	23.5	
	Medium bird	2	11.8	
Anserinae sp.	Geese sub-family	1	5.9	
Branta canadensis	Canada goose	1	5.9	1
Anatinae sp.	Ducks sub-family	1	5.9	
Haliaeetus leucocephalu:	Bald eagle	1	5.9	1
Larinae sp.	Gulls and terns	2	11.8	1
Bubo virginianus	Great horned owl	2	11.8	1
Total Bird		**17**	**100.0**	
Mammalia sp.	Indeterminate mammal	2	4.8	
	Large mammal	4	9.5	
	Medium to large mammal	12	28.6	
	Medium mammal	7	16.7	
Rattus sp.	Rats genus	1	2.4	1
Canidae sp.	Wolves, dogs and foxes	1	2.4	1
Artiodactyla sp.	Even-toed ungulates	2	4.8	
Sus scrofa	Domestic pig	3	7.1	1
Rangifer tarandus	Caribou	5	11.9	1
Bos taurus	Domestic cow	2	4.8	1
Caprinae sp.	Sheep/goat	3	7.1	1
Total Mammal		**42**	**100.0**	

Event 665 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Larinae sp.	Gulls and terns	1	100.0	
Total Bird		**1**	**100.0**	
Mammalia sp.	Large mammal	1	50.0	
Rangifer tarandus	Caribou	1	50.0	1
Total Mammal		**2**	**100.0**	

Event 678 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Mammalia sp.	Indeterminate mammal	1	6.7	
	Medium to large mammal	8	53.3	
Artiodactyla sp.	Even-toed ungulates	4	26.7	
Rangifer tarandus	Caribou	2	13.3	1
Total Mammal		**15**	**100.0**	
Indeterminate Class		**2**	**100.0**	

Event 696 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Mammalia sp.	Medium to large mammal	3	100.0	
Total mammal		**3**	**100.0**	

Event 713 -- Species Summary

Scientific Name	Common Name	NISP	%NISP	MNI
Osteichthyes sp.	Indeterminate fish	6	42.9	
Gadidae sp.	Cod family	8	57.1	1
Total Fish		**14**	**100.0**	
Aves sp.	Indeterminate bird	2	40.0	
	Small to medium bird	1	20.0	
Phalacrocorax auritu:	Double-crested cormorant	1	20.0	1
Lagopus lagopus	Willow ptarmigan	1	20.0	1
Total Bird		**5**	**100.0**	
Mammalia sp.	Large mammal	1	2.8	
	Medium to large mammal	20	55.6	
	Medium mammal	1	2.8	
Canidae sp.	Wolves, dogs and foxes	1	2.8	
Artiodactyla sp.	Even-toed ungulates	4	11.1	
Sus scrofa	Domestic pig	6	16.7	1
Rangifer tarandus	Caribou	2	5.6	1
Caprinae sp.	Sheep/goat	1	2.8	1
Total Mammal		**36**	**100.0**	

Appendix II – Ecological Profiles of Species Recovered from the Mansion House

Gastropoda sp. (Gosling 2003:1):

Gastropods represent the class of molluscs containing the highest number individual species within that phylum with over 40,000 different species of marine snails, flat shelled limpets, and shell-less sea slugs as well as terrestrial snails and slugs.

Bivalvia sp. (Gosling 2003: 44-55):

This member of the mollusc phylum represents individual animals that are enclosed in two shell halves, such as mussels, oysters, scallops and clams. There are about 7,500 different bivalve species worldwide that can be found in both marine and freshwater environments. This family is a favoured food source for human beings and is often consumed in large amounts. Economically important commercial species commonly found along the coasts of Newfoundland today include the blue mussel (*Mytilus edulis*), the bay mussel (*Mytilus trossulus*), the soft-shell clam (*Mya arenaria*), the Atlantic sea scallop (*Placopecten magellanicus*) and the Iceland scallop (*Chlamys islandica*). Mussels tend to live in the intertidal to sub-tidal regions of rocky shores within cool waters and can be found on a wide variety of substrate materials such as rock, stone, shell and even cement and wood. Oysters, on the other hand, can be found in low intertidal to sub-tidal regions of shallow and sheltered estuaries. Clams will occupy a wide range of ecological niches, from open coasts to sheltered estuaries occupying the intertidal to sub-tidal regions up to 200 meters in depth. The majority of scallop species are found at depths between 10 and 100 meters in both sheltered bays and open coastlines. Therefore, all four groups could technically be found in the waters directly off of the Ferryland peninsula, throughout the year. Today mussels, can be collected by the bucket-full just outside The Pool (Gaulton 2009, personal communication).

Atlantic herring (*Clupea harengus*) (Scott and Scott 1988: 114-118):

The Atlantic herring is a pelagic species that travels in large schools and can be found in waters up to 200 meters in depth. Spawning occurs anytime between April and November depending on the stock. A spring spawning takes place in shallow inshore waters while fall spawning takes place deeper and further offshore. Atlantic herring can grow to over 43 centimetres and weigh up to 0.68kg. Feeding on plankton and phytoplankton, their most active feeding period is believed to be between September and November. Modern day Newfoundland stocks are known to eat very little during the winter months relying, instead, on their accumulated body fat (Hodder 1972). Herring themselves are a popular source of food for many other predatory fish and birds, including the Atlantic cod.

Salmonidae sp. (Scott and Scott 1988: 120-144) :

This is a taxonomic family that consists of both anadromous and fresh water fish species. Members of this family have a varied diet ranging from crustaceans, squids, other fishes, aquatic insects and plankton. Brook trout (*Salvelinus fontinalis*), landlocked species of Arctic char (*Salvelinus alpines*), and the anadromous Atlantic salmon (*Salmo salar*) are three species that would have been present within range of Ferryland fishermen.

Gadidae sp. (Scott and Scott 1988: 259-295):

This is a large family of fish including many economically important species such as the Atlantic cod (*Gadus morhua*), the Arctic cod (*Boreogadus saida*), the Greenland cod (*Gadus ogac*), the haddock (*Melanogrammus aeglefinus*), the Atlantic tomcod (*Microgadus tomcod*), the pollock (*Pollachius virens*). Seven species of hake, 3 rockling species, 2 species of ling, the cusk (*Brosme brosme*) and the blue whiting (*Micromesistius poutasou*) are also found in this family. These are predacious fish that rely on the consumption of other fish species.

Atlantic cod (*Gadus morhua*):

Atlantic cod is a saltwater species of bony fish belonging to the Gadidae family. Individuals can grow to be over 95 centimetres in length and typically weigh about five kilograms but individuals have been recorded to weigh over 90 kilograms (Scott and Scott 1988:267). Cod are typically found in waters ranging in temperature from zero to twelve degrees Celsius (Bigelow and Schroeder 1953). Their principle sources of food includes other creatures that prey on plankton such as crustaceans, herring and capelin (Scott and Scott 1988) and the movement of these species, in part, regulates the movement of Atlantic cod in the North Atlantic. Cod typically overwinter near the shelf break in the Grand Banks of Newfoundland at depths of about 300 to 500 meters (Baird, et al. 1992). Come the spring, these fish will move onto the shelf and towards the coast following the large schools of capelin that are making their journey to spawn on Newfoundland's beaches (Lear, et al. 1986; Templeman 1966). Cod spawn in shallow waters, the major nursery areas being off the coasts of eastern Newfoundland and southern Labrador, although it is not yet known for certain during which month of the year this occurs (Anderson and Gregory 2000; Lilly and Murphy 2004). The schools of cod then move back across the shelf towards their wintering grounds in the autumn (Templeman 1966). Young individuals will remain in the shallow waters off the coasts until they reach about 3 or 4 years of age and join the adult cod (Anderson and Gregory 2000).

The seventeenth century English fisheries in Newfoundland closely followed this annual cycle. The offshore industry typically began in the late spring and was mostly finished by the end of July (Pope 2004: 29). However, the smaller inshore industry would continue catching fish in the fall until their departure in around mid to end of October (Ibid., 338). Atlantic cod fish, and more specifically, its manufacture into a product of preserved "saltfish" or wind-dried stock fish, represents the first mass produced commodity (Ibid., 11). As early as 1510, seasonal fishing crews from European ports were harvesting cod from Newfoundland waters and by the seventeenth century, the seasonal fishery in the western North Atlantic provided a substantial number of goods for the European markets (Lear 1998; Pope 2004)

Arctic flounder (*Pleuronectes glacialis*):

This marine species has a near circumpolar distribution around the northern pole. Arctic flounders are often found in shallow waters with muddy surfaces in areas close to the shore and feed on small fishes and invertebrates. They occasionally enter rivers and can grow up to 35 centimetres in length (Griffiths, et al. 1998; Nielsen 1986).

Common loon (*Gavia immer*):

This species inhabits fresh water lakes and large, slow moving rivers in the spring, summer and fall. It then migrates to inshore sea coasts or large bodies of fresh water in the winter (Godfrey 1966:9). They can be found nesting near the water's edge, usually on islands or isolated coasts and feed on small fish which they catch underwater (Godfrey 1966: 9-10). This bird is very awkward on land and is only able to take flight from the water's surface; therefore, it spends most of its time afloat in the water. They are flightless for a small period of time in the later winter (Godfrey 1966). Despite its offer of sea coasts for winter residence, the common loon is considered a common summer resident and an uncommon winter resident. The majority of the birds first appear in Newfoundland when the ice goes out in April, nesting in June and the young hatch in late June (Peters and Burleigh 1951: 47).

Red-throated loon (*Gavia stellata*):

This is the small loon with a dark grey head and a red patch on its throat. These birds nest in freshwater ponds and lakes during the summer while visiting larger lakes, rivers and salt water to feed. It frequents the sea coast in the winter (Godfrey 1966: 13-14). They are flightless for a period of time in the fall and the only loon species capable of taking off for flight from land (Godfrey 1966: 14). They are believed to be uncommon in Newfoundland, only found in interior ponds from June to September (Peters and Burleigh 1951: 48) although Montevecchi and Tuck (1987) note the species as a breeding resident of Newfoundland with only some of its populations migrating out of the island.

Double-crested cormorant (*Phalacrocorax auritus*):

This species does not stray too far from any coast whether it is marine or freshwater. It typically nests in colonies, sometimes next to other species, on the edges of rocks or cliffs or in trees provided they are close to the water (Godfrey 1966: 32). They are good divers, feed on fish, and like to fly low over the water unless travelling in large flocks (Godfrey 1966: 33). It is a fairly common resident on inland ponds and on the Newfoundland coasts from late April to September (Peters and Burleigh 1951: 69).

Domestic goose (*Anser anser*) (Urquhart 1983: 153-157):

Domesticated by 4000 B.C. from the Greylag goose, a bird common to Europe and Asia, domestic geese likely spread across Europe during the Roman period. Geese became increasingly important in the middle ages when their feathers were an important commodity. By the sixteenth century, geese were mostly used only for their feathers and likely lived to a full age. By the eighteenth century, geese were as valuable for their meat as they were for their feathers. Geese mate in pairs for life and their eggs have a poor hatchability. Making them a less useful bird for meat production but still useful for their down and feathers (Nordskog 1974: 197-199).

Canada goose (*Branta canadensis*):

These are commonly found across Canada and breed in a variety of habitats from open tundra to woodland forests. They nest and rest near bodies of water such as lakes, large streams marshes and to some extent, the sea coast (Godfrey 1966: 48-49). They can be found year round in Newfoundland but most of them leave for the winter only to return in March or April, breed in June, July and August, and leave again before the lakes and ponds freeze over (Peters and Burleigh 1951: 83).

American black duck (*Anas rubripes*):

This is a common duck species that inhabits the shallow areas of lakes, ponds, coves, bays, marshes and open water and can be found in both salt and fresh water environments. They nest in bushy or grassy areas not necessarily close to a water's edge (Godfrey 1966: 56). They are more active in the evening and at night rather than during the day. They are considered one of the favourite ducks of modern sportsmen who appreciate its good size and flavour (Godfrey 1966:57). These ducks usually appear in Newfoundland in April and leave in October, although some individuals are year round residents (Peters and Burleigh 1951:86). These ducks are swift in flight and difficult to catch (Godfrey 1966: 57). In Newfoundland they are more likely to be found in the interior rather than on the coast (Peters and Burleigh 1951: 87).

Northern pintail duck (*Anas acuta*):

This is a distinct species of duck with a slender neck and a pointed tail which frequents shallow fresh water lakes, ponds and marshes and occasionally shallow margins of the sea coast. It nests on the ground either near or far from bodies of water(Godfrey 1966: 58). It is considered a rare summer visitor to Newfoundland and observations in the mid 20th century suggest it may breed in the interior of the province (Peters and Burleigh 1951: 91).

Long-tailed duck (*Clangula hyemalis*):

The long-tailed duck is easily distinguished by a long and pointed tail but is different from the northern pintail by its colour markings. It is a diving duck that inhabits tundra lakes and ponds in the summer and coastal seas or larger freshwater bodies of water in the winter(Godfrey 1966: 72-73). It is commonly found on the Newfoundland coasts in the winter and only occasionally found in the summer (Peters and Burleigh 1951: 110).

Common eider (*Somateria mollissima*):

This is a marine species of duck commonly found along rocky coasts and shores in proximity of mussel beds and reefs. It nests near the coast in rock sheltered areas or depressions formed in the rock face (Godfrey 1966: 75). Two sub-species inhabit the coasts of Ferryland: the northern common eider (*Somateria mollissima borealis*) which is found on the island during the winter months, and the American common eider (*Somateria mollissima dresseri*) which breeds on the island's coasts in the summer months, arriving in May and leaving in October(Peters and Burleigh 1951: 112-115).

<u>King eider (*Somateria spectabilis*):</u>

The king eider is another marine duck species whose adult male is uniquely distinguished by a "knoblike yellow frontal shield" over its bill, while the adult female closely resembles females of the common eider species (Godfrey 1966: 77). They breed in the Canadian Arctic within freshwater systems during the summer and winter in the open water off the coasts of Newfoundland and Labrador (Godfrey 1966: 78). They are only considered a common transient on the Newfoundland coast and are associated with the arrival of pack ice (Peters and Burleigh 1951: 119).

<u>White-winged scoter (*Melanitta deglandi*):</u>

The white-winged scoter is a large diving duck which inhabits near shore saltwater areas and large freshwater lakes and rivers. It is said to rarely ever come onto land unless it is nesting (Godfrey 1966). It usually flies low over the water and can be found throughout the year on Newfoundland's coast (Peters and Burleigh 1951: 120)

<u>Bald eagle (*Haliaeetus leucocephalus*):</u>

This is a large and iconic bird widely distributed throughout North America. They are usually found near the coasts of fresh- and salt-bodies of water. They nest mostly in the tops of trees and subsist mainly on fish, the majority of which is scavenged and not caught live. Wingspans for males average around 182 to 215 centimetres in length (Godfrey 1966: 97-98). The bald eagle can be found year round in Newfoundland but is more common during the summer months (Peters and Burleigh 1951: 138)

<u>Willow ptarmigan (*Lagopus lagopus*):</u>

A wild pheasant, the willow ptarmigan is described as a "smallish Arctic or alpine grouse" (Godfrey 1966: 110) that nests on the ground within well hidden areas such as bushes (Peters and Burleigh 1951: 150). In Newfoundland, it is found in the tundra of the interior (Peters and Burleigh 1951: 150). Today, the willow ptarmigan is the most sought after game bird in Newfoundland and is found over much of the barren lands that cover the inland areas of the island and the Avalon Peninsula (Peters and Burleigh 1951: 150). It is a year-round breeding resident of the barrens of the Avalon Peninsula (Montevecchi and Tuck 1987: 28, 225).

<u>Domestic Turkey (*Meleagris gallopavo*):</u>

Turkeys are naturally present in their wild form in North America but not on the island of Newfoundland (Godfrey 1966). Wild turkeys from continental North America were taken to Europe, domesticated and then brought back to North America (Powell 1990 in Bowen and Traverthen Andrews 2000: 66). Turkeys became quite popular very quickly and eventually replaced the celebratory species of the rich, such as the peacocks and the swans as well as the birds of the poor such as the herons and bustards (Wilson 1991: 129) Despite the inability to distinguish wild from domestic turkeys osteologically, the remains recovered from Ferryland are treated as the domestic variety.

Domestic Chicken (*Gallus gallus*) (Grigg 1989:189-191):

Modern hens are very productive farm animals capable of producing an average of 270 eggs in a year. They are raised in controlled environments that are not regulated by a seasonal cycle and the environment. Chickens can be used for their eggs or their meat. They feed on grain and do not need much land relative to the amount of food they can produced. Prior to the 1900s in England, chicken were not kept in large numbers and were considered part of the domestic economy rather than part of the farm.

Plover (*Charadrius* sp. (Peters and Burleigh 1951: 168-175):

Plovers are small shore birds with plump bodies found along the Newfoundland coast. A total of 4 different plover species are commonly found on the Avalon Peninsula today: the semipalmated ringed plover (*Charadrius hiaticula*) and the Eastern piping plover (*Charadrius melodus*) are common summer residents on the island. The black-bellied plover (*Squatarola squatarola*) and the American ruddy turnstone (*Arenaria interpres*) are fairly common fall transients during their migration.

Spotted sandpiper (*Actitis macularia*):

The spotted sandpiper is one of 9 species from the scolopacidae family found in Newfoundland (Peters and Burleigh 1951: 176-210). They inhabit the rocky, sandy or muddy shores of interior lakes and ponds and of the sea coast. They build their nest on the ground, in close proximity to the water (Godfrey 1966: 146). They are very abundant in Newfoundland during the summer, arriving mid-May and leaving by October (Peters and Burleigh 1951: 186).

Glaucous gull (*Larus hyperboreus*):

This is a large sea gull identified by its lack of colouring on the wing tips. It breeds in northern Canada and the Arctic and is almost always found along the sea coast (Godfrey 1966: 174). It spends its winters along the Atlantic and Pacific coasts and to a lesser extent, along the Great Lakes (Godfrey 1966: 175). It is considered a fairly common winter resident on the Newfoundland coast especially when pack ice is drifting by offshore (Peters and Burleigh 1951: 221).

Great black-backed gull (*Larus marinus*):

This is the largest of the sea gull species in eastern Canada. They are highly distinctive with a solid black mantle over their backs and over the dorsal surface of their wings. They can be found nesting on cliffs or on coastal islands (Godfrey 1966: 176). This species breeds in Newfoundland and can be found here year round but does appear in greater abundance during the winter as northern populations come further south (Godfrey 1966:176; Peters and Burleigh 1951: 225).

<u>Herring gull (*Larus argentatus*):</u>

This is a large species from this family that is known as the common "sea gull". It inhabits various types of shores, both freshwater and coastal and is today known to feed on anything (Godfrey 1966: 178). It breeds in Newfoundland where it is found in great abundance during the summer months. It remains a common species on the island during the winter but populations migrating south for the season do diminish its numbers (Peters and Burleigh 1951: 228).

<u>Ring-billed gull (*Larus delawarensis*):</u>

The ring-billed gull is the smallest of the four *Larus* species found in the Mansion House assemblage. Like the herring gull, it too have now adopted a foraging strategy based on the way humans deposit their refuse. Some colonies do breed on the Avalon Peninsula (Godfrey 1966) and it is most common in Newfoundland during the summer (Peters and Burleigh 1951: 231).

<u>Black-legged kittiwake (*Rissa tridactyla*):</u>

This is the smallest of all the gulls found in Newfoundland. It is a marine species that is only found along the sea coast during the breeding season and is found in pelagic waters for the remainder of the year (Godfrey 1966: 186). It is a very common resident in Newfoundland, especially during the breeding season (Peters and Burleigh 1951: 238).

<u>Arctic tern (*Sterna paradisaea*)</u>

This bird species forages over both fresh and salt water and is found on a circumpolar range breeding in the Arctic and sub-Arctic, including on the island of Newfoundland (Godfrey 1966: 190). It is considered to be a common resident on the island during the summer breeding months with over 19 nesting colonies. This bird possibly has the longest migration route of any avian species on the planet as they migrate from the Arctic to the Antarctic (Peters and Burleigh 1951: 244-245)

<u>Great auk (*Pinguinus impennis*):</u>

This was the largest flightless bird to inhabit the northern hemisphere, now extinct, the great auk inhabited the waters off the North Atlantic coast and, like other members of the Alcidae family, would nest on rocky coasts and offshore islands (Godfrey 1966: 195). The last recorded specimen was recorded in Iceland on June 3rd, 1844 (Godfrey 1966: 195). These birds provided Europeans with an abundant source of fresh meat that was easy to take. The extinction of the species is the result of overhunting by humans (Peters and Burleigh 1951: 246-247).

In Newfoundland, it is known to have bread on Funk island, where Jacques Cartier wrote an account of them in 1534, and possibly at other locations (Montevecchi and Tuck 1987). Funk island is located approximately 55 kilometres north east off the coast of Central Newfoundland and over 170 nautical miles from Ferryland. Direct procurement of Great Auk from Funk Island by Ferryland residents could only come about after a long voyage, unless it was obtained by trade or if the Great Auk was breeding somewhere closer to the site. Portuguese etymology for locations along the Avalon coast reveal names like *Y. de los patas* (Goose/Auk Island, Great

Island in Witless Bay?), *R. das patas* (Goose/Auk River, inlet at Calvert/Capelin Bay?) *and C. das patas*(Goose/Auk Cape, near Ferryland)(Seary 1971). Pope (2009) notes that only the shores of the inlet at Calvert/Capelin Bay have the low incline and smooth rocky slopes needed by the Great Auk to come ashore and may be a location where the bird was harvested by Europeans.

<u>Common murre (*Uria aalge*):</u>

This is a strictly marine species spends its winters at least five miles out from shore and returns in the summer months to breed on Newfoundland's cliffs and offshore islands. These birds breed in large colonies often alongside other species each pair producing only one egg per season (Godfrey 1966: 196-197). This species is an abundant resident in Newfoundland during the summer, the largest extant colony is found at Witless Bay (Peters and Burleigh 1951: 254), less than 30km north of Ferryland.

<u>Thick-billed murre (*Uria lomvia*):</u>

This is a species that is very similar in both nature and appearance to the common murre. It is differentiated by a slightly thicker bill and slightly different plumage markings. It too is a marine bird that spends most of the year out to sea, except for the breeding season spent nesting on cliffs and coastal islands, often alongside common murre colonies (Godfrey 1966: 197). They are more common in the winter in Newfoundland and, although some do breed here, they prefer the colder waters of the Labrador and northern Newfoundland coast during the summer (Peters and Burleigh 1951: 256).

<u>Black guillemot (*Cephus grylle*):</u>

Commonly known as the "sea pigeon", the black guillemot is a marine bird that spends its winters offshore and its summers by the coast where colonies nest on the rocky shores and coastal islands (Godfrey 1966: 199). These birds are commonly found on all of Newfoundland's coasts. Most of them go out to sea for the winter when the ice pushes them away, but some can still be found in the sheltered bays where open water and food remains available (Peters and Burleigh 1951: 260-261).

<u>Domestic pigeon (*Columba livia*):</u>

The domestic pigeon, also known as the domestic dove, were first domesticated during the Roman period (Yalden and Albarella 2009: 106). The consumption of domestic pigeons was quite common in Early Modern England, although not on the same scale as in Medieval times (Wilson 1991: 128). Many were bred in dovecotes by the gentry in the seventeenth century, however, these were beginning to be more of a nuisance as the birds began feeding more and more on the farmer's own crops instead of on the peasant's corn (Williamson 1995: 32; Wilson 1991: 128).

<u>Great horned owl (*Bubo virginianus*):</u>

This is a very large owl distinguished by the prominent feather tufts behind its ears. They are found throughout Canada in both deciduous and coniferous forests and any wooded areas where they can prey on small birds and mammals. They nest in trees and are most active during the night (Godfrey 1966: 213). They are fairly common in Newfoundland and can be found there throughout the year (Peters and Burleigh 1951: 267).

Snowy owl (*Bubo scandiaca*):

This bird is as large as the great horned owl and is generally white all over. This owl species prefers the tundra, fields and prairies where it perches on the ground or on small trees, posts or rocks (Godfrey 1966: 214). The snowy owl likes the winter weather and will only be found in Newfoundland during the winter. It will fly north to the Arctic to breed in the summer (Peters and Burleigh 1951: 268-269).

Common raven (*Corvus corax*):

This bird can be differentiated from the common crow by its larger size, larger bill and longer throat feathers. They can be found in a wide range of habitats from forests to sea coasts. It is a scavenger that will take a meal where it can (Godfrey 1966: 275). It is especially common in Newfoundland in the summer but still present during the winter months (Peters and Burleigh 1951: 283).

Rabbits and Hares (Leporidae sp.) (Banfield 1974: 75-92):

Rabbits and hares are very similar osteologically and unfortunately, the elements recovered from the Mansion House could not be identified any more precisely. There is only one wild species of hare present naturally found in Newfoundland and that is the Arctic hare (*Lepus arcticus*). Today this species inhabits the inland barren grounds and mountains of Newfoundland and has been mostly relegated to the west coast of the island after the introduction of the snowshoe hare in 1864 provided competition for resources and diminished their numbers. Historically, it is thought to have been abundant on the island with accounts of fisherman not going too far inland to procure them. Domestic rabbits (*Oryctolagus cuniculus*) brought in from Europe represents another possible species of this taxonomic family that could be present in the Mansion House assemblage.

American beaver (*Castor canadensis*) (Banfield 1974: 158-162):

The beaver is an industrious and complex creature sought after by Europeans and Native Americans alike for its fur and its meat. They inhabit the low-flowing freshwater streams, rivers, marshes and small lakes and usually in forested regions. The beaver is naturally found all across Newfoundland.

Rats and mice superfamily (Muroidea sp.):

This taxonomic group includes both New and Old World rodents. In Newfoundland, the only two wild species that belong to this group are the muskrat (*Ondatra zibethicus*) and the meadow vole (*Microtus pennsylvanicus*) (Banfield 1974: 178-221). Old World species found in Newfoundland today after their introduction to the island by Europeans includes the black rat (*Rattus rattus*) the brown rat (*Rattus norvegicus*) and the house mouse (*Mus musculus*).

Rats (*Rattus* sp.):

Specimen identifications could not go beyond that of the genus level because of the lack of a black rat (*Rattus rattus*) specimen in the reference collection. However, it is known that the Norway rat (*Rattus norvegicus*) did not arrive in the American colonies until 1775 (Webster, et al. 1985). If this date holds true for Newfoundland as well, then the black rat is likely the only rat species present in Ferryland. Black rats are climbers and typically build their nests in trees or upper levels of buildings. Black rats typically gather together in groups (Bowen and Trevarthen Andrews 2000: 19). Rats have adapted well to many environments but prefer to stay near/within human settlements. They may move out into the fields and forest edges during the summer months, but are more likely to seek shelter in barns, warehouses, garbage middens, haystacks, harbour areas and even private homes during the winter months, feeding on the refuse deposited by humans (Banfield 1974: 221-223).

House Mouse (*Mus musculus*):

These are a nocturnal and very social species that live in groups and build their nests from grass and dust within protected environments, such as underneath buildings, in between their walls or within other types of locations within buildings. They are mainly terrestrial but will occasionally burrow into the ground or utilize old abandoned burrows from other rodents. This species is not original to North America and came from Europe as stowaways on European vessels (Banfield 1974: 223-224).

Whales, dolphins and porpoises (Cetaceae sp. and Dolphinidae sp.) (Banfield 1974: 238-285):

One dolphin and one whale/dolphin bone were recovered from the Mansion House and could not be further identified to species. There are 20 different species of whales and dolphins currently present in the waters of the North Atlantic: Sowerby's beaked whale (*Mesoplodon bidens*), Blainville's beaked whale (*Mesoplodon densirostris*), True's beaked whale (*Mesoplodon mirus*), the Northern bottlenosed whale (*Hyperoodon ampullatus*), the common dolphin (*Delphinus delphis*), the white-beaked dolphin (*Lagenorhynchus albirostris*), the Atlantic white-sided dolphin (*Lagenorhynchus acutus*), the orca or killer whale (*Orcinus orca*), the Atlantic pilot whale (*Glovicephala melaena*), the harbour porpoise (*Phocoena phocoena*), the fin whale (*Balaenoptera physalus*), the minke whale (*Balaenoptera acutorostrata*), the blue whale (*Balaenoptera musculus*), the humpback whale (*megaptera novaeangliae*), the right whale (*balaena glacialis*) and the bowhead whale (*Balaena mysticetus*). Among all of these species, there is a year round presence of Cetaceans in the waters off of Newfoundland, however, the majority of them are more likely to be present in the summer months, when the pack ice has left and the schools of fish and krill make their way close to the shore.

Domestic dog (*Canis familiaris*):

Dogs were domesticated independently in both the old and new worlds from wild forms of the species (Zeuner 1963). I was unable to determine the species of the dog recovered from Structure 18 but more information could be obtained from this specimen by an expert in canine skeletal remains.

Red fox (*Vulpes vulpes*) (Banfield 1974: 299-301):

These nervous and timid animals are solitary in the fall and winter months and family oriented in the spring and summer. They nest in dens, usually expanded woodchuck burrows, and prefer to spend their time in semi-open country such as agricultural areas, openings in the forests and lakeshores. Young are born between March and May. The Newfoundland variety is paler then its mainland relative with an almost straw coloured coat.

Domestic cat (*Felis catus*):

At least one complete cat was recovered from the Mansion House assemblage. It is not surprising to learn that the Europeans brought cats with them to Ferryland as they are excellent for hunting mice and small rodents, which the evidence suggests were quite a nuisance in the Mansion House.

Harbour seal (*Phoca vitulina*):

The harbour seal is one of the most widely spread and common seals known worldwide. They come together in small groups when on land and disperse when in the water where they feed on fish and the occasional mollusc. They can be found on coastal waters and up to ten kilometres off shore. It can be found on all of Newfoundland's coasts. Pups are born at some time between mid-May and mid-June and are weaned after about a month's time (Banfield 1974: 369-372) They are a medium sized seal with adults ranging between 55 and 130 kilograms. They are year-round residents in Newfoundland but are more likely to be encountered on the shore in the spring when giving birth on the shore or in the early summer (Bonner 1994).

Harp seal (*Phoca groenlandica*):

This species is only slightly larger than the harbour seal with adults capable of reaching six feet in length with adults weighing about 130 kilograms. These seals are known f or their beautiful fur coats and their pups are recognized worldwide with their white, long and fluffy fur. These are highly gregarious animals converging in large numbers onto the ice flows to give birth, mate and moult. This species spends most of the year in the Arctic on the edges of pack ice. They can be found on these ice flows from January to May off the coasts of Newfoundland and Labrador. It is then that the ice begins to melt and the seals make their way north towards Baffin Bay. The Harp seals rarely ever venture onto land (Banfield 1974: 375-378). They are a migratory species present of eastern Newfoundland shores in the spring (Sergeant 1991: 33-45).

Domestic pig (*Sus scrofa*) (Grigg 1989: 189-190):

Biologically, pigs are the most productive domestic mammal. Modern populations are capable of producing two or more litters of piglets each year, which means a possibility of over 20 offspring to a sow. They are normally raised in controlled environments that are not regulated by a seasonal cycle or environmentally determined feeding patterns. They can eat a variety of food, from grains and vegetables to dairy by-products and household refuse. They do not require much space relative to the amount of food they can produce. Their meat can be preserved by salting or smoking in a manner that was much easier than with beef or mutton.

Caribou (*Rangifer tarandus*):

The caribou is one of the most primitive members of the deer family (Cervidae sp.) and represents the largest artiodactyl in Newfoundland prior to 1878 when moose (*Alces alces*) were introduced to the island. Antlers are present on both males and females and their forms are highly variable. Among the Newfoundland population, 30 percent of the females are without antlers (Banfield 1974:383-388). The antlers begin to appear in March and undergo rapid development between May and July. They are large (three to four feet long among males) and velvety in August, polished by October and lost by early November. The female's antlers are kept year round and only drop before they give birth. Caribou are social animals, often found in bands or loose herds (Banfield 1974: 383-388). The Newfoundland populations are known as woodland caribou; however, this should not suggest that they are found only inhabiting the forests. Those of the Avalon peninsula spends the majority of their lives in the open barren lands (Dugmore 1913: 122-123). The mating period occurs between October and November and the fawns are born around mid-May to the beginning of July (Banfield 1974: 383-388).

Domestic cow (*Bos taurus*):

Cattle were useful for a variety of products and services that they could offer. Oxen could be used to plow the fields while cows provided milk used to make a variety of dairy products. All cattle were an excellent source of meat. Cattle graze on grasses, grains and other vegetation in the summer and need to be fed stored provisions in the winter (Thirsk 1990; Trow-Smith 1957; Wilson 1991).

Domestic sheep (*Ovis aries*) and Domestic goat (*Capra hircus*):

Sheep and goats can be useful to humans for their meat, milk, wool and skins alike and are considered perhaps the most versatile domesticated farm animal (Pope and Terrill 1974: 168). They are also easy to care for as they can nutritionally feed on a variety of plants including "weeds, grasses, shrubs, roots, cereals, leaves and bark" (Pope and Terrill 1974: 168). Sheep can normally produce one lamb a year and sometimes two (Grigg 1989: 189).

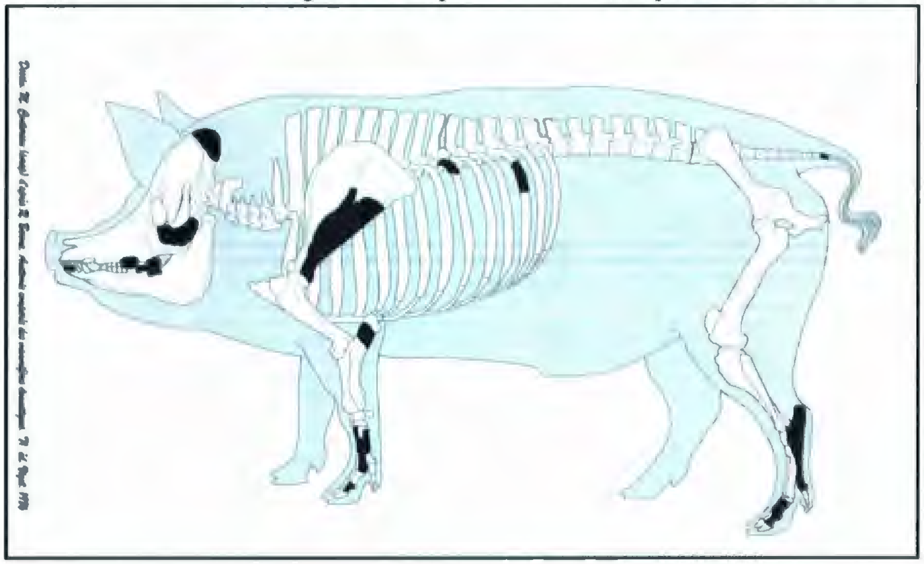
Domestic Horse (*Equus caballus*) (Loy and Cole 1974: 202-207):

First domesticated in the old world, the modern horse was originally introduced to the New World by Spanish colonists and conquistadors. Horses found in Newfoundland must have been introduced by the Europeans colonists and fisherman of the sixteenth or early seventeenth century. A few important tasks are attributed to the horse other than for its importance in the military; it represents a source of power for difficult labour such as drafting the fields and it represents a source of transportation and primary means for herding cattle.

Appendix III – Body Portion Representation for Pig (*Sus scrofa*), Caribou (*Rangifer tarandus*), Cattle (*Bos taurus*) and Sheep/goat (Caprinae sp.) for Events 613, 627, 632, 634 and 651.

Notes on appendix:
Shaded areas indicate the specimens recovered in the Mansion House assemblage
Red lines indicate locations of cut marks
Images modified from www.archaeozoo.org and Bowen and Trevarthen-Andrews (2000).

Event 613 -- *Sus scrofa* Body Portion Representation



HEAD

Cranials

Mandible

AXIAL

Ribs

1 caudal vertebra

UPPER FORE QUARTER

Scapula

LOWER FORE QUARTER

Ulna

2 Metacarpal IV

LOWER HIND QUARTER

Calcaneus

1 Metatarsal V

1 Tarsal IV

LOWER QUARTER

1 Metapodial

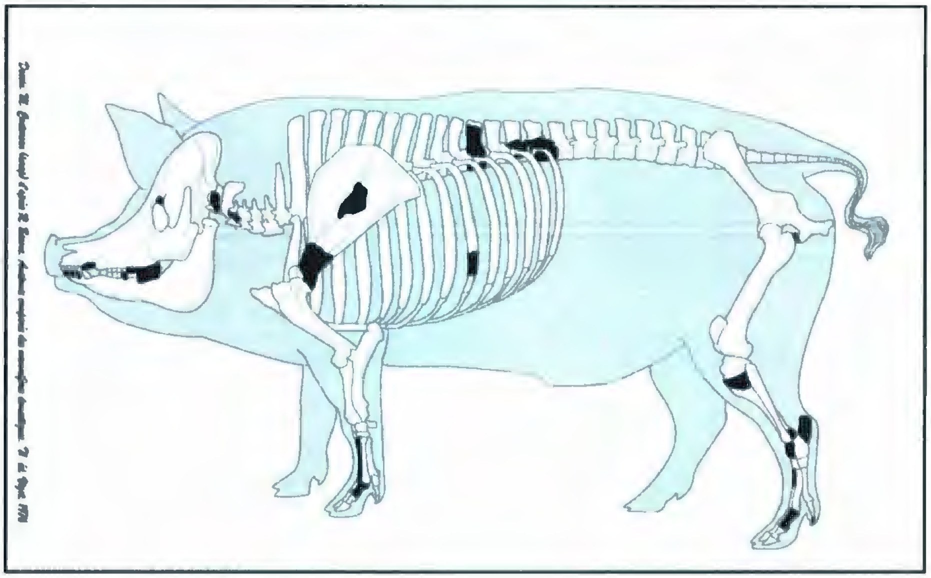
1 Metapodial V

FEET

2 Proximal phalanges

2 Medial phalanges

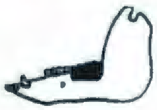
Event 627 -- *Sus scrofa* Body Portion Representation



HEAD

Cranial

Mandible



NECK

1x Atlas (C1)

Cervical vertebra

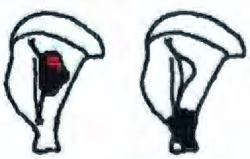
AXIAL

Thoracic vertebrae

Rib

UPPER FORE QUARTER

Scapulae



LOWER FORE QUARTER

1x metacarpal III

Continued...

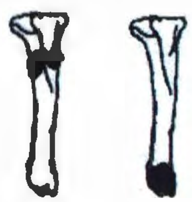
...Event 627 -- *Sus scrofa* Body Portion Representation

UPPER HIND QUARTER

Innominate

LOWER HIND QUARTER

Tibiae



Calcaneus

Astragali

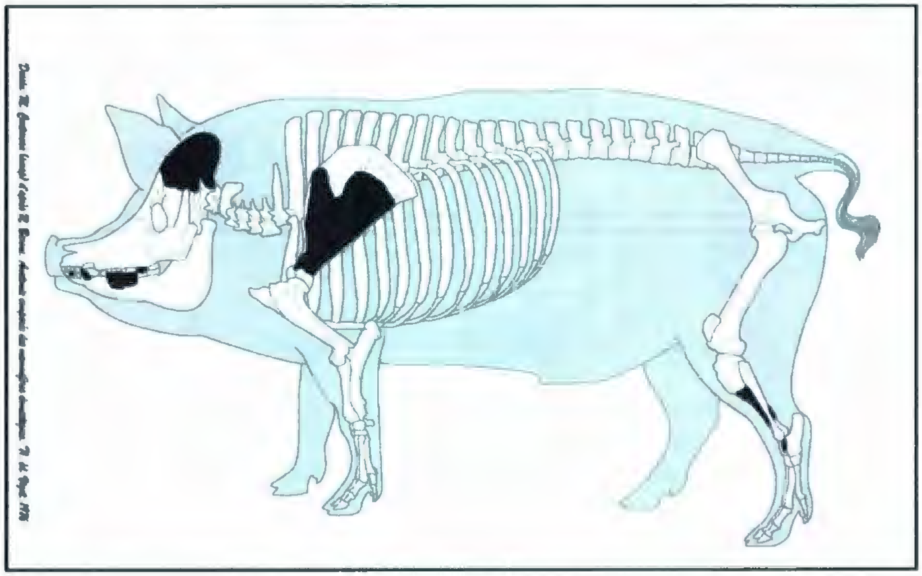
1x Metatarsal III

FOOT

2x Proximal phalanges

1x Distal phalanx II/V

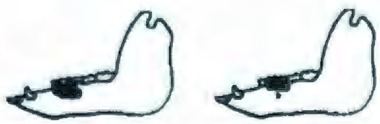
Event 632 -- *Sus scrofa* Body Portion Representation



HEAD

Cranial

Mandibles



UPPER FORE QUARTER

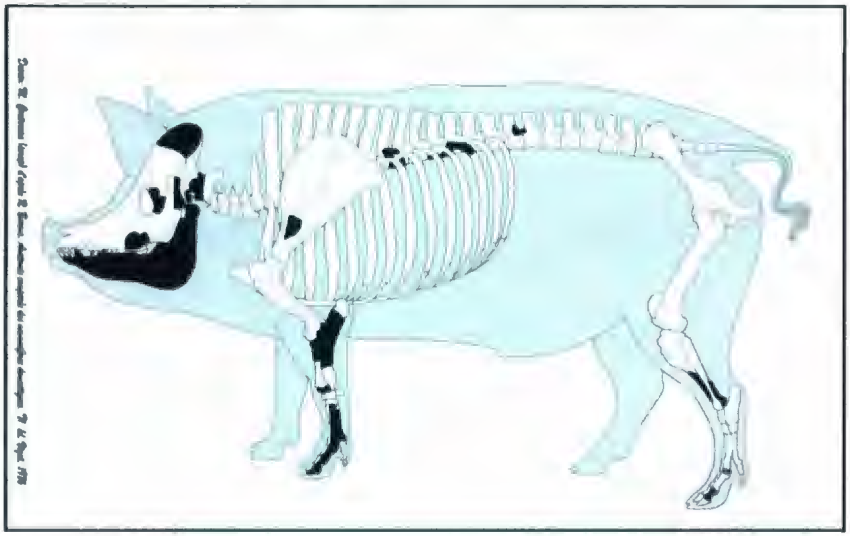
Scapulae

LOWER HIND QUARTER

Tibia

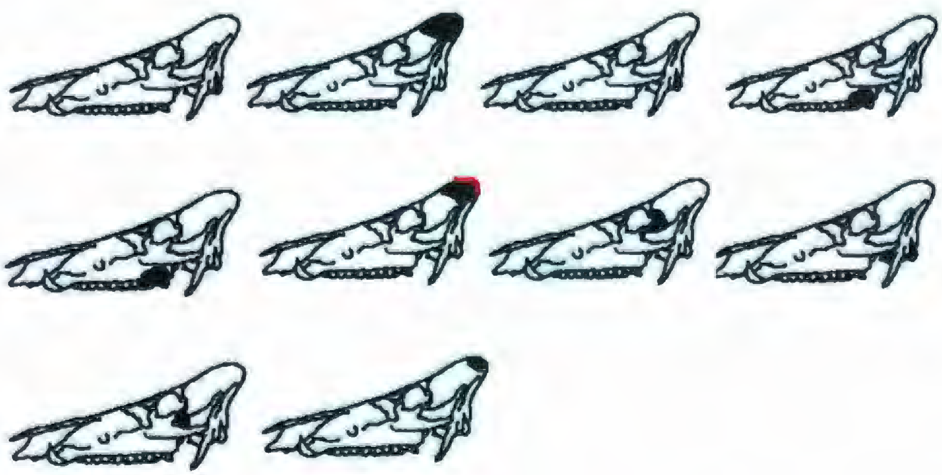
Astragalus

Event 634 -- *Sus scrofa* Body Portion Representation



HEAD

Cranials



Mandibles

NECK

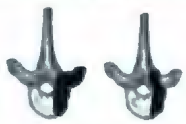
2x Atlas (vertebra C1)

Continued...

... Event 634 -- *Sus scrofa* Body Portion Representation

AXIAL

Thoracic vertebra

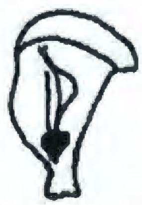


Lumbar vertebra

Rib

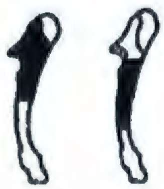
UPPER FORE QUARTER

Scapula

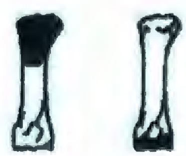


LOWER FORE QUARTER

Ulnae



Radii



1x Carpal radiale
1x Carpal ulnare
1x Metacarpal IV
1x Metacarpal V

LOWER HIND QUARTER

Tibia

LOWER QUARTER

2x Metapodials

FEET

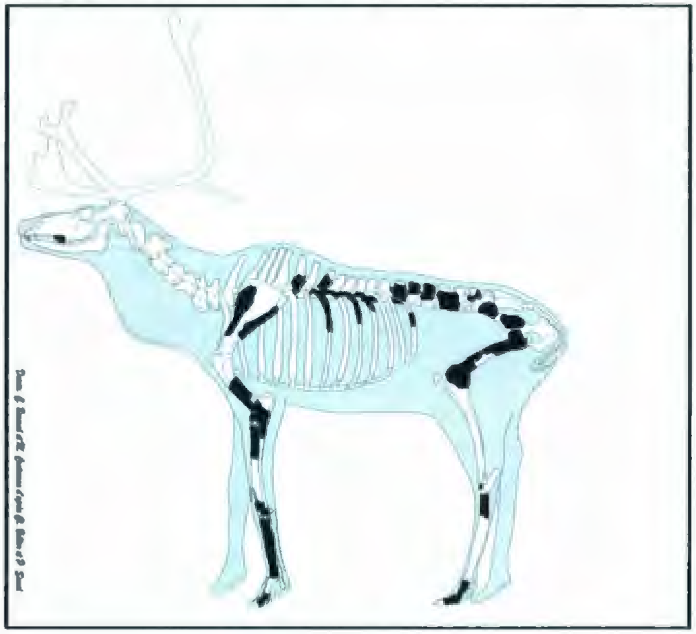
2x Proximal phalanges
4x Medial phalanges
4x Distal phalanges

Event 651 -- *Sus scrofa* Body Portion Representation

Axial

Thoracic vertebra

Event 613 -- *Rangifer tarandus* Body Portion Representation



HEAD

Cranium

AXIAL

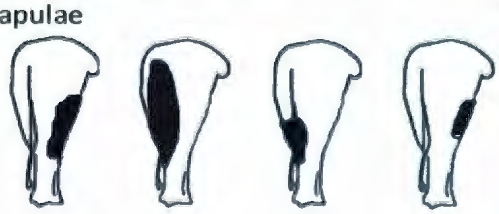
Ribs

Thoracic vertebrae

Lumbar vertebrae

UPPER FORE QUARTER

Scapulae



Humeri

Continued...

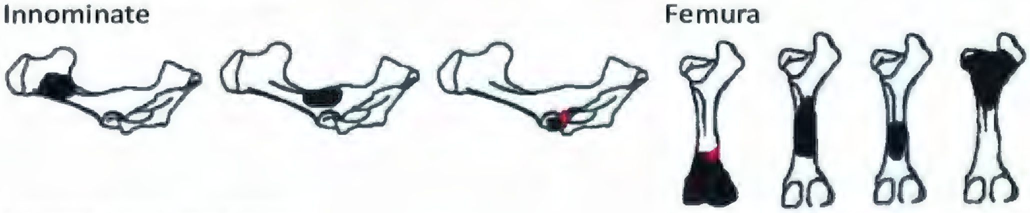
... Event 613 -- *Rangifer tarandus* Body Portion Representation

LOWER FORE QUARTER

Radii Ulna Metacarpal III/IV 1 carpal ulnare

UPPER HIND QUARTER

Innominate Femura



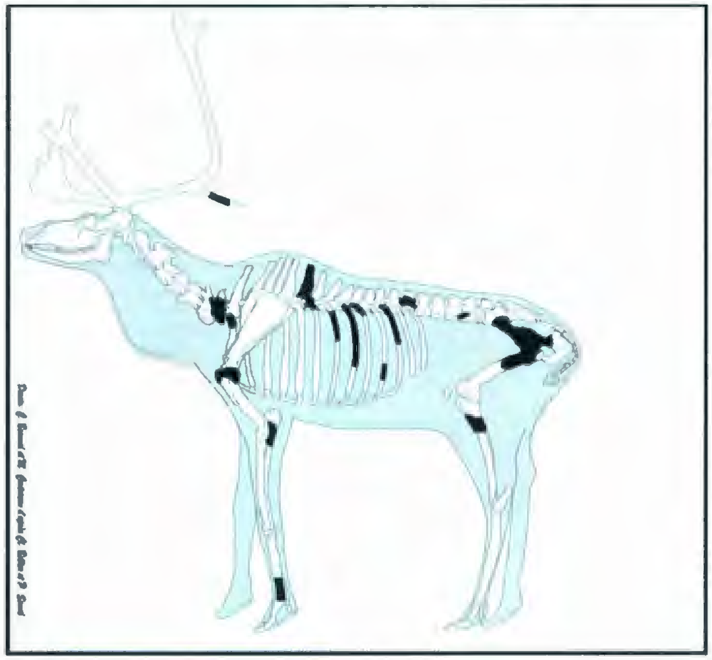
LOWER HIND QUARTER

Metatarsals III/IV Astragalus

FEET

1 proximal phalanx
3 medial phalanges

Event 627 -- *Rangifer tarandus* Body Portion Representation



ANTLER
1x tyne fragment

NECK
Vertebra, C7

AXIAL

Thoracic vertebrae

Lumbar vertebra

Ribs

Continued...

... Event 627 -- *Rangifer tarandus* Body Portion Representation

UPPER FORE QUARTER

Humerus

LOWER FORE QUARTER

Ulna

Metacarpal III/IV

UPPER HIND QUARTER

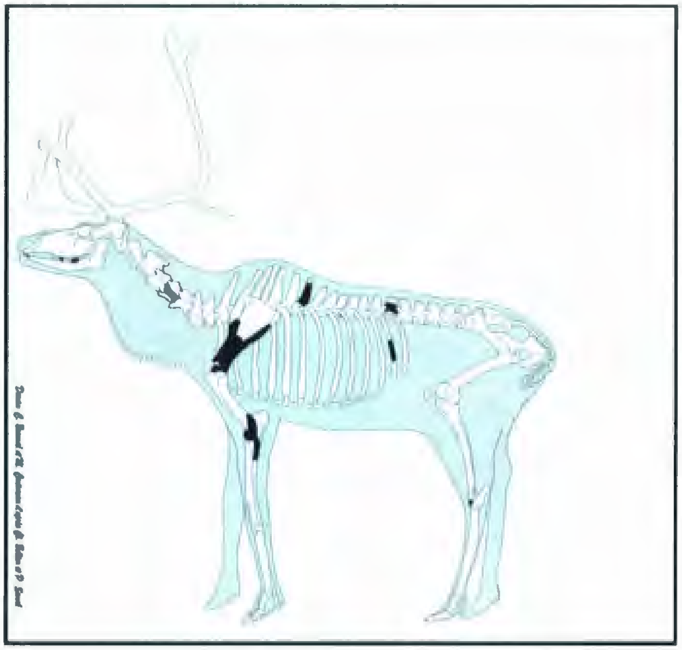
Innominates

Femur

LOWER HIND QUARTER

Tibia

Event 632 -- *Rangifer tarandus* Body Portion Representation



NECK

Cervical vertebra

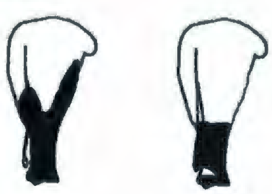
AXIAL

Thoracic vertebrae

Rib

UPPER FOREQUARTER

Scapulae



Humerus

Continued...

... Event 632 -- *Rangifer tarandus* Body Portion Representation

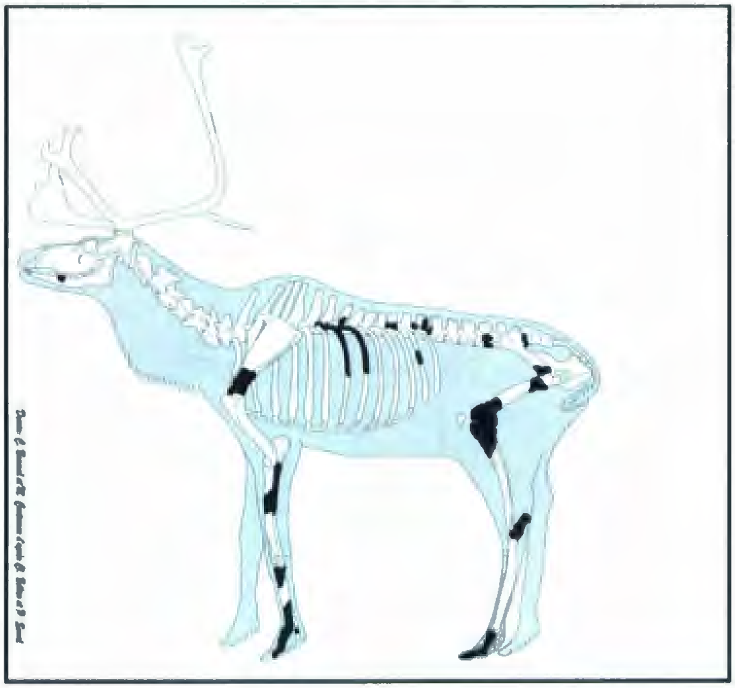
LOWER FORE QUARTER

Ulna

LOWER HIND QUARTER

Astragali

Event 634 -- *Rangifer tarandus* Body Portion Distribution



HEAD

Mandible

AXIAL

Thoracic vertebrae

Lumbar vertebra

Sacrum

Rib

UPPER FORE QUARTER

Scapula

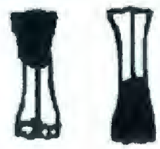
Continued...

... Event 634 -- *Rangifer tarandus* Body Portion Distribution

LOWER FORE QUARTER

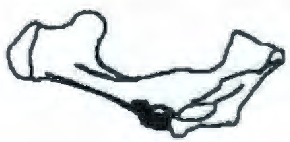
Ulnae

Metacarpals III/IV

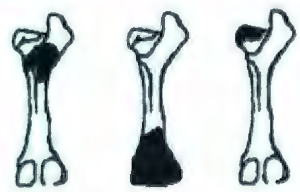


UPPER HIND QUARTER

Innominate



Femura



LOWER HIND QUARTER

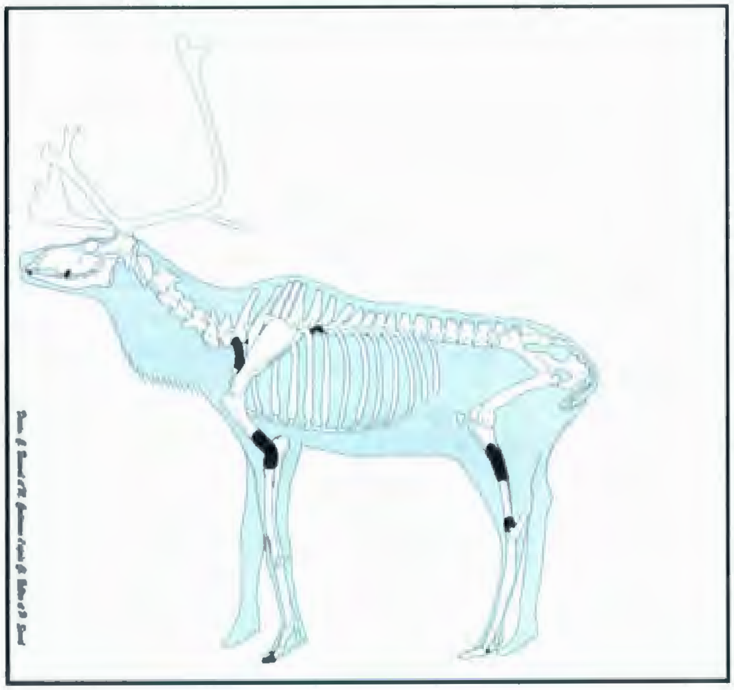
Tibia

Calcaneus

FEET

3x Proximal phalanges
1x Medial phalanx
1x Digit II/V medial phalanx

Event 651 -- *Rangifer tarandus* Body Portion Representation

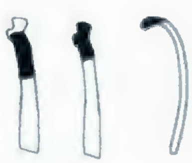


HEAD

Cranial

AXIAL

Ribs



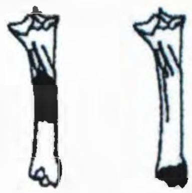
UPPER FORE QUARTER

Continued...

...Event 651 -- *Rangifer tarandus* Body Portion Representation

LOWER HIND QUARTER

Tibiae

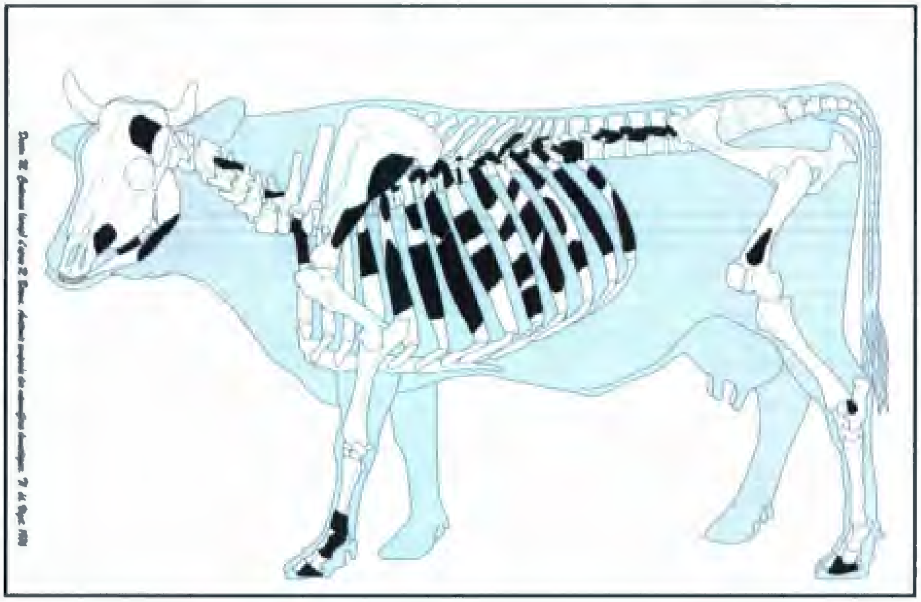


FEET

1x distal phalanx

1x sesamoid

Event 613 -- *Bos taurus* Body Portion Representation



HEAD

2x Cranials

Mandible

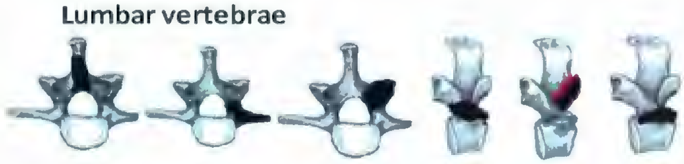
NECK

Cervical vertebrae

AXIAL

Thoracic vertebrae

Lumbar vertebrae



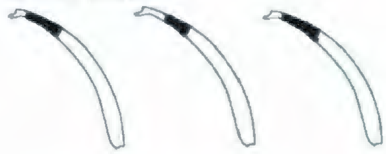
Ribs

Continued...

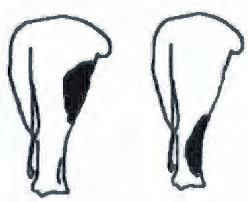
... Event 613 -- *Bos taurus* Body Portion Representation

Ribs

Lower Ribs



UPPER FORE QUARTER
Scapulae



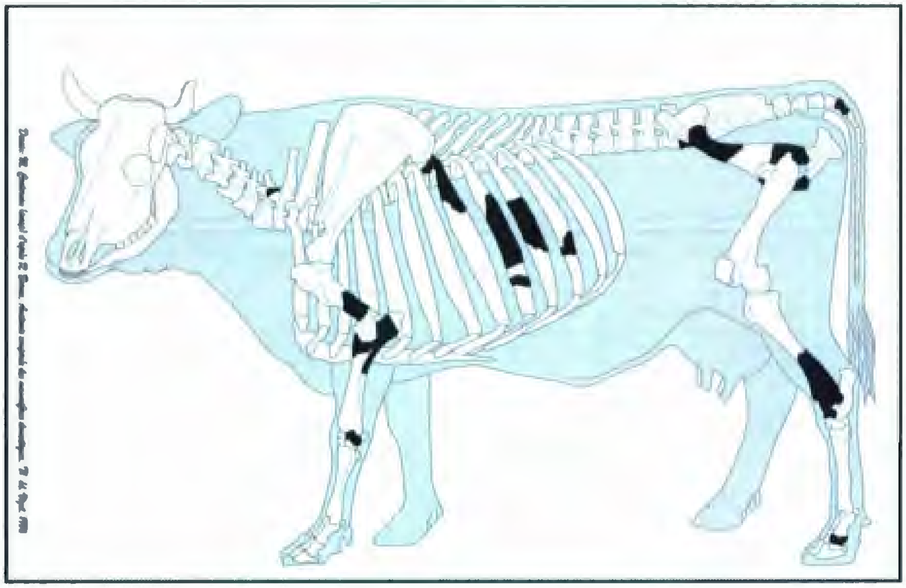
LOWER QUARTER
Metapodial

UPPER HIND QUARTER
Femur

LOWER HIND QUARTER
Astragali

FEET
1x Proximal phalanx
2x Distal phalanges

Event 627 -- *Bos taurus* Body Portion Representation



NECK

Cervical vertebra

AXIAL

Ribs

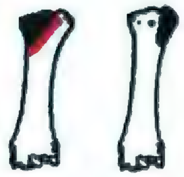
UPPER FORE QUARTER

Humerus

LOWER FORE QUARTER

Ulnae

Radii



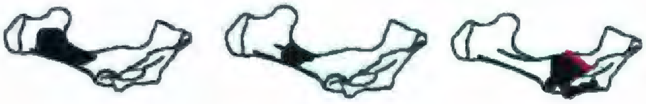
1x Carpal radiale

Continued...

...Event 627 -- *Bos taurus* Body Portion Representation

UPPER HIND QUARTER

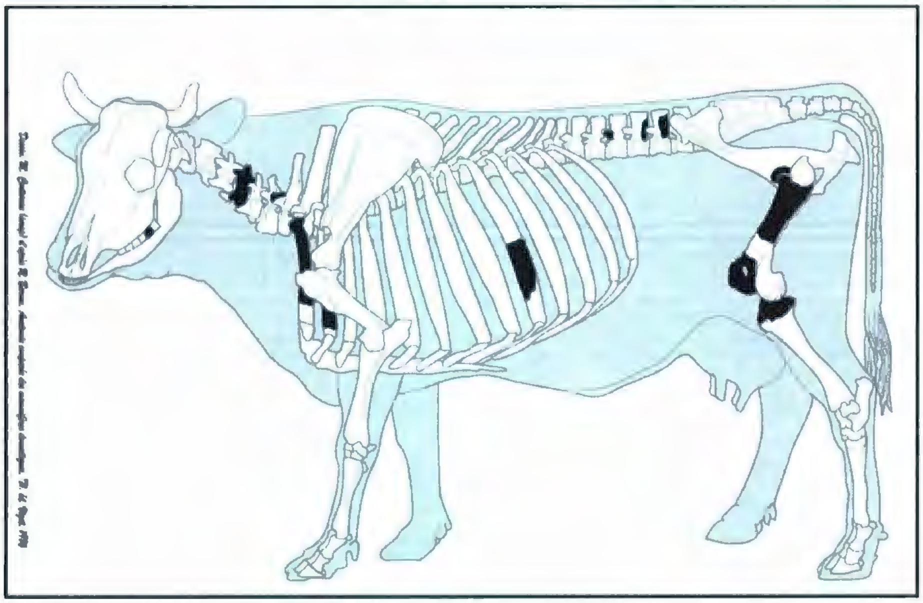
Innominates



LOWER HIND QUARTER

Tibia Astragalus 1x Fibula

Event 632 -- *Bos taurus* Body Portion Representation

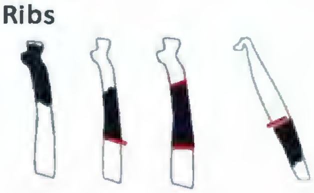


NECK

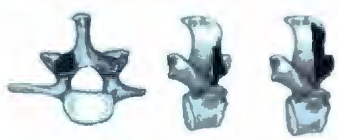
Cervical vertebrae

AXIAL

Ribs



Lumbar vertebrae



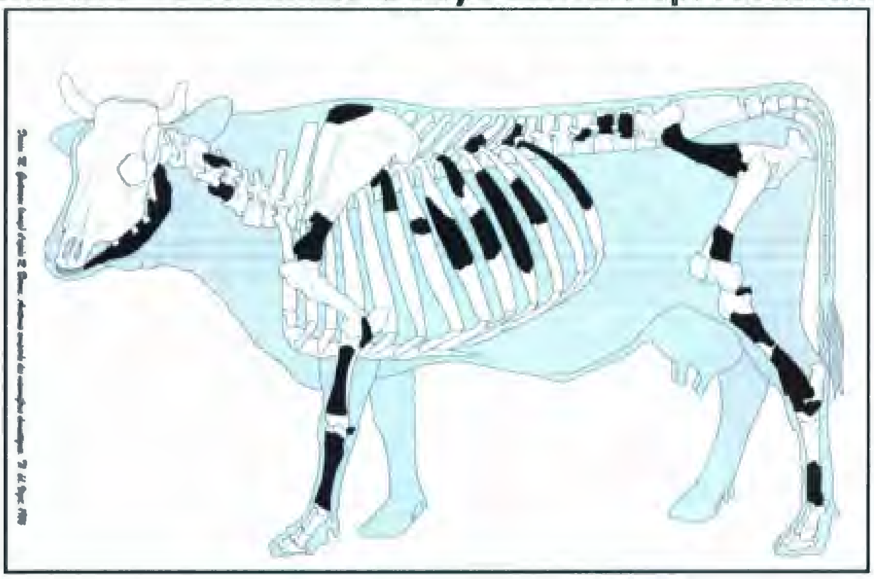
UPPER HIND QUARTER

Femura

LOWER HIND QUARTER

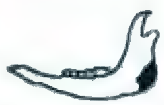
Tibia 1x Patella

Event 634 -- *Bos taurus* Body Portion Representation



HEAD

Mandible



1x Zygomatic
1x Occipital

NECK

Cervical vertebrae

AXIAL

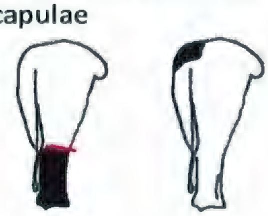
Ribs

Thoracic vertebrae

Lumbar vertebra

UPPER FORE QUARTER

Scapulae



Continued...

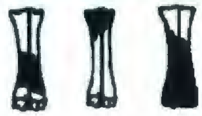
...Event 634 -- *Bos taurus* Body Portion Representation

LOWER FORE QUARTER

Radius

Ulna

Metacarpal III/IV

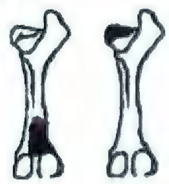


1x Carpal intermidiate
1x Carpal ulnare
1x Carpal radiale
1x Carpal IV

UPPER HIND QUARTER

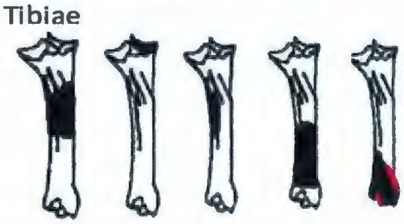
Innominates

Femura



LOWER HIND QUARTER

Tibiae



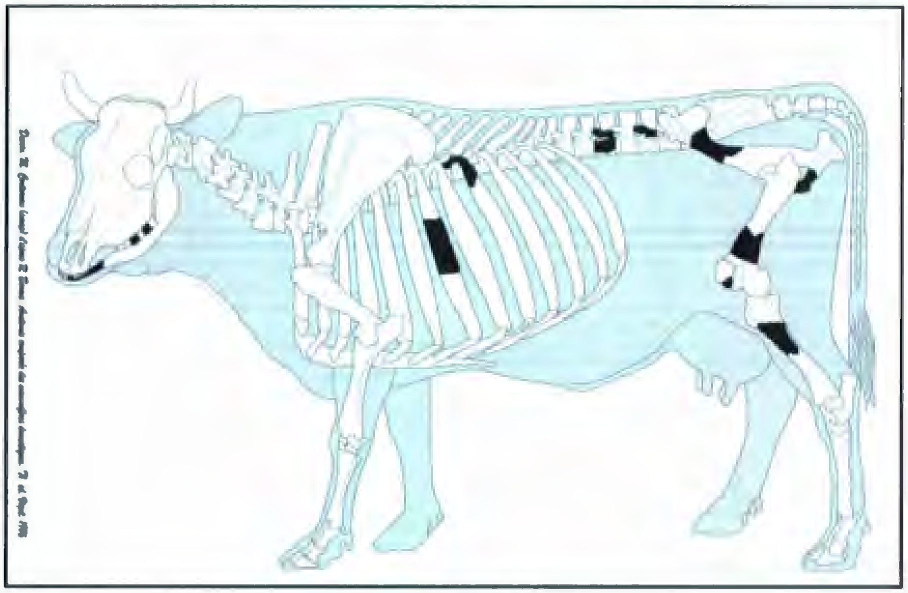
Metatarsals III/IV

Calcaneus

Astragalus

1x Fibula

Event 651 -- *Bos taurus* Body Portion Representation



HEAD

Mandible

AXIAL

Ribs

Lumbar vertebrae

UPPER HIND QUARTER

Innominates

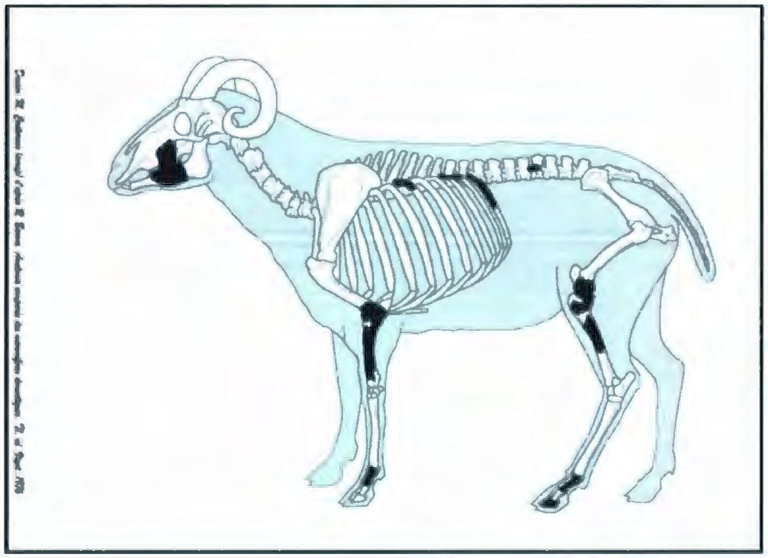
Femur

LOWER FORE QUARTER

Tibia

1 patella

Event 613 -- Caprine Body Portion Representation



HEAD

Cranium

Mandible

AXIAL

Ribs

First thoracic vertebra

Lumbar vertebra

UPPER FORE QUARTER

Humerus

LOWER FORE QUARTER

Ulna

Radius

UPPER HIND QUARTER

Femur

LOWER HIND QUARTER

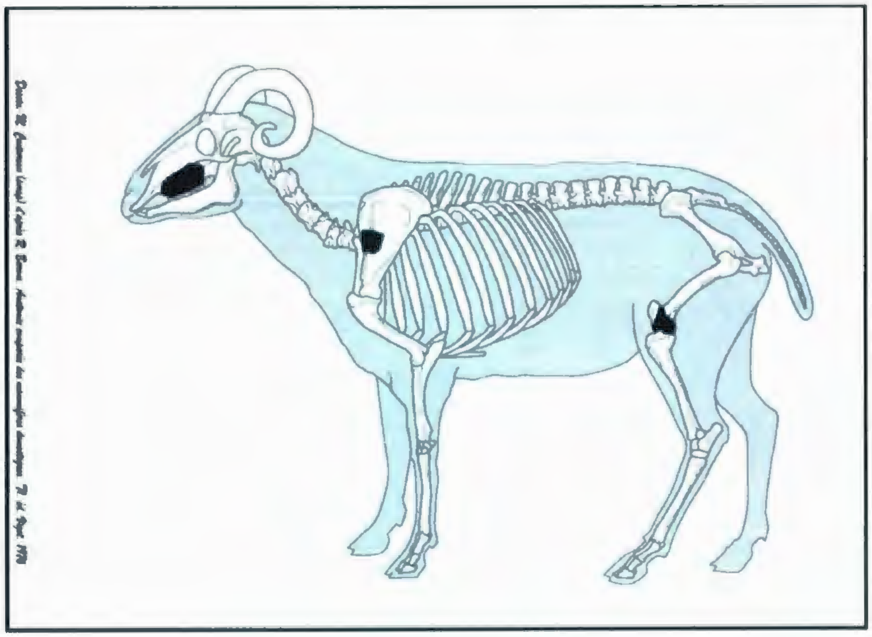
Tibia

FEET

2 proximal phalange:

1 distal phalanx

Event 627 -- Caprine Body Portion Representation

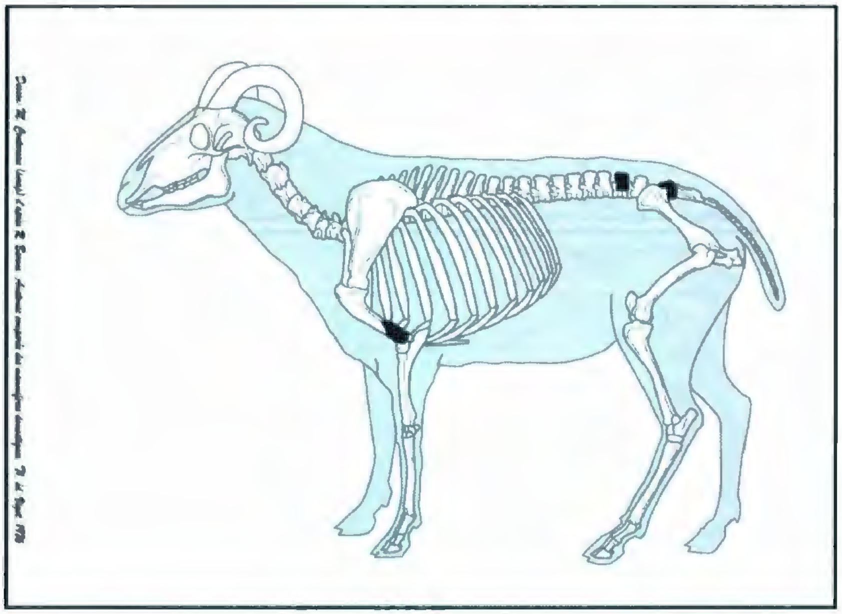


HEAD
Cranial

UPPER FORE QUARTER
Scapula

UPPER HIND QUARTER
Femur

Event 632 -- Caprine Body Portion Representation



UPPER FORE QUARTER

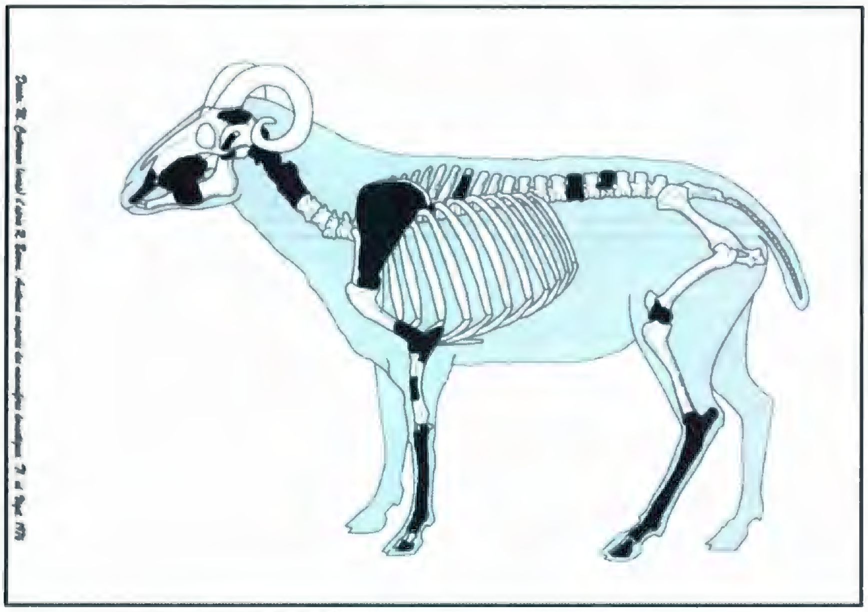
Humerus

AXIAL

Lumbar vertebra

Sacrum

Event 634 -- Caprine Body Portion Representation



HEAD

Cranial

Mandible

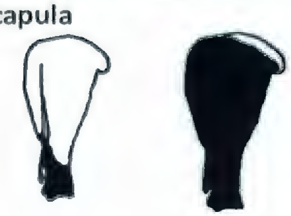
AXIAL

Thoracic vertebra

Lumbar vertebrae

UPPER FORE QUARTER

Scapula



Humerus

Continued...

... Event 634 -- Caprine Body Portion Representation

LOWER FORE QUARTER

Radius

Ulnae

Metacarpals III/IV

2x carpal II/III
1x carpal radiale

LOWER HIND QUARTER

Metatarsal III/IV

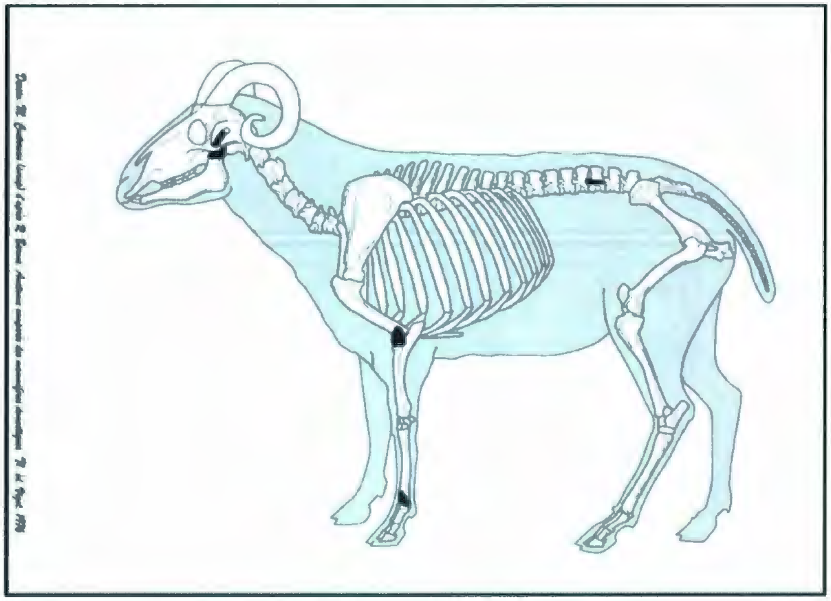
Calcaneus

1x Fibula
2x Tarsal IV and central, fused

FEET

2x proximal phalanges

Event 651 -- Caprine Body Portion Representation



HEAD

Mandible

AXIAL

Lumbar vertebra

UPPER FORE QUARTER

Humerus

LOWER QUARTER

Metapodial III/IV

Appendix IV – Kill-off Data

Ferryland, Event 613
Age Distribution Based on Epiphysial Fusion
Sus scrofa (Domestic Pig)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 0 to 12 Months		
Scapula	1	0
Innominate	0	0
Humerus – distal	0	0
Radius – proximal	0	0
Second phalanx – distal	2	0
Percent Age Range	**43%**	**0%**
Age of Fusion – 12 to 24 Months		
Metacarpal – distal	0	0
First phalanx – proximal	0	2
Tibia – distal	0	0
Percent of Age Range	**0%**	**29%**
Age of Fusion – 24 to 30 Months		
Calcaneus	0	1
Metatarsal – distal	1	0
Fibula – distal	0	0
Percentage of Age Range	**14%**	**14%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – distal	0	0
Ulna – proximal	0	0
Ulna – distal	0	0
Femur – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Fibula – proximal	0	0
Percent of Age Range	**0%**	**0%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 627
Age Distribution Based on Epiphysial Fusion
Sus scrofa (Domestic Pig)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 0 to 12 Months		
Scapula	1	0
Innominate	0	0
Humerus – distal	0	0
Radius – proximal	0	0
Second phalanx – distal	0	0
Percent Age Range	**17%**	**0%**
Age of Fusion – 12 to 24 Months		
Metacarpal – distal	0	1
First phalanx – proximal	2	0
Tibia – distal	0	1
Percent of Age Range	**33%**	**33%**
Age of Fusion – 24 to 30 Months		
Calcaneus	0	1
Metatarsal – distal	0	0
Fibula – distal	0	0
Percentage of Age Range	**0%**	**17%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – distal	0	0
Ulna – proximal	0	0
Ulna – distal	0	0
Femur – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Fibula – proximal	0	0
Percent of Age Range	**0%**	**0%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 634
Age Distribution Based on Epiphysial Fusion
Sus scrofa (Domestic Pig)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 0 to 12 Months		
Scapula	0	1
Innominate	0	0
Humerus – distal	0	0
Radius – proximal	1	0
Second phalanx – distal (proximal?)	3	0
Percent Age Range	**33%**	**8%**
Age of Fusion – 12 to 24 Months		
Metacarpal – distal	1	1
First phalanx – proximal	2	0
Tibia – distal	1	0
Percent of Age Range	**33%**	**8%**
Age of Fusion – 24 to 30 Months		
Calcaneus	0	0
Metatarsal – distal	0	0
Fibula – distal	0	0
Percentage of Age Range	**0%**	**0%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – distal	0	1
Ulna – proximal	0	1
Ulna – distal	0	0
Femur – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Fibula – proximal	0	0
Percent of Age Range	**0%**	**17%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 613
Age Distribution Based on Epiphysial Fusion
Rangifer tarandus (Caribou)

Bone and Epiphysis	Fused	Not Fused
Age of fusion – 4 to 12 months		
Vertebral centra (4-6)	1	2
Radius – proximal (4-9)	0	0
Acetabulum (10-12)	0	0
Percent Age Range	**8%**	**17%**
Age of fusion – 7 to 24 months		
Second phalanx (7-18)	2	0
Humerus – distal (17-21)	0	1
First phalanx (18-21)	1	0
Tibia – distal (19-24)	0	0
Percent Age Range	**25%**	**8%**
Age of fusion – 25 to 39 months		
Calcaneum (25-27)	0	0
Metacarpal (25-27)	1	1
Metatarsal (25-27)	0	0
Ulna – distal (28-33)	0	0
Ulna – proximal (28-39)	0	0
Percent Age Range	**8%**	**8%**
Age of fusion – 28 to 40+ months		
Radius – distal (28-40+)	0	1
Femur – distal (28-40+)	1	0
Tibia – proximal (28-40+)	0	0
Femur – proximal (31-40+)	1	0
Humerus – proximal (40+)	0	0
Sacrum (40+)	0	0
Percent Age Range	**17%**	**8%**

Adapted from Purdue 1983

Ferryland, Event 627
Age Distribution Based on Epiphysial Fusion
Rangifer tarandus (Caribou)

Bone and Epiphysis	Fused	Not Fused
Age of fusion – 4 to 12 months		
Vertebral centra (4-6)	0	1
Radius – proximal (4-9)	0	0
Acetabulum (10-12)	1	0
Percent Age Range	**17%**	**17%**
Age of fusion – 7 to 24 months		
Second phalanx (7-18)	0	0
Humerus – distal (17-21)	0	0
First phalanx (18-21)	0	0
Tibia – distal (19-24)	0	0
Percent Age Range	**0%**	**0%**
Age of fusion – 25 to 39 months		
Calcaneum (25-27)	0	0
Metacarpal (25-27)	1	0
Metatarsal (25-27)	0	0
Ulna – distal (28-33)	0	0
Ulna – proximal (28-39)	0	0
Percent Age Range	**17%**	**0%**
Age of fusion – 28 to 40+ months		
Radius – distal (28-40+)	0	0
Femur – distal (28-40+)	0	0
Tibia – proximal (28-40+)	0	0
Femur – proximal (31-40+)	1	0
Humerus – proximal (40+)	0	2
Sacrum (40+)	0	0
Percent Age Range	**17%**	**33%**

Adapted from Purdue (1983)

Ferryland, Event 632
Age Distribution Based on Epiphysial Fusion
Rangifer tarandus (Caribou)

Bone and Epiphysis	Fused	Not Fused
Age of fusion – 4 to 12 months		
Vertebral centra (4-6)	1	0
Radius – proximal (4-9)	0	0
Acetabulum (10-12)	0	0
Percent Age Range	**50%**	**0%**
Age of fusion – 7 to 24 months		
Second phalanx (7-18)	0	0
Humerus – distal (17-21)	1	0
First phalanx (18-21)	0	0
Tibia – distal (19-24)	0	0
Percent Age Range	**50%**	**0%**
Age of fusion – 25 to 39 months		
Calcaneum (25-27)	0	0
Metacarpal (25-27)	0	0
Metatarsal (25-27)	0	0
Ulna – distal (28-33)	0	0
Ulna – proximal (28-39)	0	0
Percent Age Range	**0%**	**0%**
Age of fusion – 28 to 40+ months		
Radius – distal (28-40+)	0	0
Femur – distal (28-40+)	0	0
Tibia – proximal (28-40+)	0	0
Femur – proximal (31-40+)	0	0
Humerus – proximal (40+)	0	0
Sacrum (40+)	0	0
Percent Age Range	**0%**	**0%**

Adapted from Purdue (1983)

Ferryland, Event 634
Age Distribution Based on Epiphysial Fusion
Rangifer tarandus (Caribou)

Bone and Epiphysis	Fused	Not Fused
Age of fusion – 4 to 12 months		
Vertebral centra (4-6)	1	0
Radius – proximal (4-9)	0	0
Acetabulum (10-12)	0	0
Percent Age Range	**8%**	**0%**
Age of fusion – 7 to 24 months		
Second phalanx (7-18)	2	0
Humerus – distal (17-21)	0	0
First phalanx (18-21)	1	3
Tibia – distal (19-24)	0	0
Percent Age Range	**25%**	**25%**
Age of fusion – 25 to 39 months		
Calcaneum (25-27)	0	1
Metacarpal (25-27)	0	0
Metatarsal (25-27)	0	0
Ulna – distal (28-33)	0	0
Ulna – proximal (28-39)	0	0
Percent Age Range	**0%**	**8%**
Age of fusion – 28 to 40+ months		
Radius – distal (28-40+)	0	0
Femur – distal (28-40+)	0	1
Tibia – proximal (28-40+)	0	1
Femur – proximal (31-40+)	0	1
Humerus – proximal (40+)	0	0
Sacrum (40+)	0	1
Percent Age Range	**0%**	**33%**

Adapted from Purdue (1983)

Ferryland, Event 651
Age Distribution Based on Epiphysial Fusion
Rangifer tarandus (Caribou)

Bone and Epiphysis	Fused	Not Fused
Age of fusion – 4 to 12 months		
Vertebral centra (4-6)	0	0
Radius – proximal (4-9)	0	0
Acetabulum (10-12)	1	0
Percent Age Range	**50%**	**0%**
Age of fusion – 7 to 24 months		
Second phalanx (7-18)	0	0
Humerus – distal (17-21)	0	0
First phalanx (18-21)	0	0
Tibia – distal (19-24)	1	0
Percent Age Range	**50%**	**0%**
Age of fusion – 25 to 39 months		
Calcaneum (25-27)	0	0
Metacarpal (25-27)	0	0
Metatarsal (25-27)	0	0
Ulna – distal (28-33)	0	0
Ulna – proximal (28-39)	0	0
Percent Age Range	**0%**	**0%**
Age of fusion – 28 to 40+ months		
Radius – distal (28-40+)	0	0
Femur – distal (28-40+)	0	0
Tibia – proximal (28-40+)	0	0
Femur – proximal (31-40+)	0	0
Humerus – proximal (40+)	0	0
Sacrum (40+)	0	0
Percent Age Range	**0%**	**0%**

Adapted from Purdue (1983)

Ferryland, Event 627
Age Distribution Based on Epiphysial Fusion
Bos taurus (Domestic Cow)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 0 to 12 Months		
Scapula	0	0
Innominate	2	0
Percent Age Range	**40%**	**0%**
Age of Fusion – 12 to 24 Months		
Humerus – distal	0	0
Radius – proximal	2	0
First phalanx – proximal	0	0
Second phalanx – proximal	0	0
Percent of Age Range	**40%**	**0%**
Age of Fusion – 24 to 36 Months		
Metacarpal – distal	0	0
Tibia – distal	0	0
Metatarsal – distal	0	0
Metapodial – distal	0	0
Percentage of Age Range	**0%**	**0%**
Age of Fusion – 36 to 48 Months		
Humerus – proximal	0	0
Radius – distal	0	0
Ulna – proximal	0	1
Ulna – distal	0	0
Femur – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Calcaneus	0	0
Percent of Age Range	**0%**	**20%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 632
Age Distribution Based on Epiphysial Fusion
Bos taurus (Domestic Cow)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 0 to 12 Months		
Scapula	0	0
Innominate	0	0
Percent Age Range	**0%**	**0%**
Age of Fusion – 12 to 24 Months		
Humerus – distal	0	0
Radius – proximal	0	0
First phalanx – proximal	0	0
Second phalanx – proximal	0	0
Percent of Age Range	**0%**	**0%**
Age of Fusion – 24 to 36 Months		
Metacarpal – distal	0	0
Tibia – distal	0	0
Metatarsal – distal	0	0
Metapodial – distal	0	0
Percentage of Age Range	**0%**	**0%**
Age of Fusion – 36 to 48 Months		
Humerus – proximal	0	0
Radius – distal	0	0
Ulna – proximal	0	0
Ulna – distal	0	0
Femur – proximal	0	4
Femur – distal	0	1
Tibia – proximal	0	1
Calcaneus	0	0
Percent of Age Range	**0%**	**100%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 634
Age Distribution Based on Epiphysial Fusion
Bos taurus (Domestic Cow)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 0 to 12 Months		
Scapula	0	0
Innominate	1	0
Percent Age Range	**14%**	**0%**
Age of Fusion – 12 to 24 Months		
Humerus – distal	0	0
Radius – proximal	0	0
First phalanx – proximal	0	0
Second phalanx – proximal	0	0
Percent of Age Range	**0%**	**0%**
Age of Fusion – 24 to 36 Months		
Metacarpal – distal	1	0
Tibia – distal	1	0
Metatarsal – distal	2	0
Metapodial – distal	0	0
Percentage of Age Range	**57%**	**0%**
Age of Fusion – 36 to 48 Months		
Humerus – proximal	0	0
Radius – distal	0	0
Ulna – proximal	0	0
Ulna – distal	0	0
Femur – proximal	0	1
Femur – distal	0	1
Tibia – proximal	0	0
Calcaneus	0	0
Percent of Age Range	**0%**	**28%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 651
Age Distribution Based on Epiphysial Fusion
Bos taurus (Domestic Cow)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 0 to 12 Months		
Scapula	0	0
Innominate	0	1
Percent Age Range	**0%**	**100%**
Age of Fusion – 12 to 24 Months		
Humerus – distal	0	0
Radius – proximal	0	0
First phalanx – proximal	0	0
Second phalanx – proximal	0	0
Percent of Age Range	**0%**	**0%**
Age of Fusion – 24 to 36 Months		
Metacarpal – distal	0	0
Tibia – distal	0	0
Metatarsal – distal	0	0
Metapodial – distal	0	0
Percentage of Age Range	**0%**	**0%**
Age of Fusion – 36 to 48 Months		
Humerus – proximal	0	0
Radius – distal	0	0
Ulna – proximal	0	0
Ulna – distal	0	0
Femur – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Calcaneus	0	0
Percent of Age Range	**0%**	**0%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 613
Age Distribution Based on Epiphysial Fusion
Caprines (Domestic Sheep and Goats)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 6 to 10 Months		
Scapula	0	0
Innominate	0	0
Humerus – distal	1	0
Radius – proximal	0	0
Percent Age Range	**17%**	**0%**
Age of Fusion – 12 to 36 Months		
Ulna – proximal	0	0
Ulna – distal	0	0
Metacarpal – distal	0	0
Femur – proximal	0	0
Tibia – distal	0	0
Metatarsal – distal	0	0
Metapodial – distal	0	0
Calcaneus	0	0
First phalanx – proximal	2	0
Second phalanx – proximal	0	0
Percent of Age Range	**33%**	**0%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – proximal	1	0
Femur – distal	0	1
Tibia – proximal	0	1
Percent of Age Range	**17%**	**33%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 627
Age Distribution Based on Epiphysial Fusion
Caprines (Domestic Sheep and Goats)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 6 to 10 Months		
Scapula	0	0
Innominate	0	0
Humerus – distal	0	0
Radius – proximal	0	0
Percent Age Range	**0%**	**0%**
Age of Fusion – 12 to 36 Months		
Ulna – proximal	0	0
Ulna – distal	0	0
Metacarpal – distal	0	0
Femur – proximal	0	0
Tibia – distal	0	0
Metatarsal – distal	0	0
Metapodial – distal	0	0
Calcaneus	0	0
First phalanx – proximal	0	0
Second phalanx – proximal	0	0
Percent of Age Range	**0%**	**0%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – proximal	0	0
Femur – distal	0	1
Tibia – proximal	0	0
Percent of Age Range	**0%**	**100%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 632
Age Distribution Based on Epiphysial Fusion
Caprines (Domestic Sheep and Goats)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 6 to 10 Months		
Scapula	0	0
Innominate	0	0
Humerus – distal	0	1
Radius – proximal	0	0
Percent Age Range	**0%**	**100%**
Age of Fusion – 12 to 36 Months		
Ulna – proximal	0	0
Ulna – distal	0	0
Metacarpal – distal	0	0
Femur – proximal	0	0
Tibia – distal	0	0
Metatarsal – distal	0	0
Metapodial – distal	0	0
Calcaneus	0	0
First phalanx – proximal	0	0
Second phalanx – proximal	0	0
Percent of Age Range	**0%**	**0%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Percent of Age Range	**0%**	**0%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 634
Age Distribution Based on Epiphysial Fusion
Caprines (Domestic Sheep and Goats)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 6 to 10 Months		
Scapula	2	0
Innominate	0	0
Humerus – distal	1	0
Radius – proximal	0	0
Percent Age Range	**21%**	**0%**
Age of Fusion – 12 to 36 Months		
Ulna – proximal	0	2
Ulna – distal	0	0
Metacarpal – distal	1	0
Femur – proximal	0	0
Tibia – distal	0	0
Metatarsal – distal	1	0
Metapodial – distal	0	1
Calcaneus	0	0
First phalanx – proximal	2	2
Second phalanx – proximal	0	2
Percent of Age Range	**29%**	**50%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Percent of Age Range	**0%**	**0%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 634
Age Distribution Based on Epiphysial Fusion
Sheep Lamb or Goat Kid Single Individual

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 6 to 10 Months		
Scapula	2	0
Innominate	0	0
Humerus – distal	2	0
Radius – proximal	2	0
Percent Age Range	**23%**	**0%**
Age of Fusion – 12 to 36 Months		
Ulna – proximal	0	1
Ulna – distal	0	0
Metacarpal – distal	0	1
Femur – proximal	0	0
Tibia – distal	0	1
Metatarsal – distal	0	1
Metapodial – distal	0	0
Calcaneus	0	1
First phalanx – proximal	0	6
Second phalanx – proximal	0	4
Percent of Age Range	**0%**	**57%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	2
Radius – distal	0	2
Femur – distal	0	1
Tibia – proximal	0	0
Percent of Age Range	**0%**	**19%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Ferryland, Event 651
Age Distribution Based on Epiphysial Fusion
Caprines (Domestic Sheep and Goats)

Bone and Epiphysis	Fused	Not Fused
Age of Fusion – 6 to 10 Months		
Scapula	0	0
Innominate	0	0
Humerus – distal	0	1
Radius – proximal	0	0
Percent Age Range	**0%**	**50%**
Age of Fusion – 12 to 36 Months		
Ulna – proximal	0	0
Ulna – distal	0	0
Metacarpal – distal	0	0
Femur – proximal	0	0
Tibia – distal	0	0
Metatarsal – distal	0	0
Metapodial – distal	1	0
Calcaneus	0	0
First phalanx – proximal	0	0
Second phalanx – proximal	0	0
Percent of Age Range	**50%**	**0%**
Age of Fusion – 36 to 42 Months		
Humerus – proximal	0	0
Radius – proximal	0	0
Femur – distal	0	0
Tibia – proximal	0	0
Percent of Age Range	**0%**	**0%**

Adapted from: Bowen and Trevathen Andrews 2000; Chaplin 1971; Maltby 1979 and Silver 1969

Appendix V: Distribution of Gadidae and cod (*Gadus morhua*) elements in the Mansion House assemblage

Distribution of Gadidae and cod (*Gadus morhua*) elements presented in NISP.

		Events											
	Elements	613	626	627	630	630-631	631	632	633	634	651	652	713
Head													
	angular	5		6				3	1	19			1
	basioccipital			1						6			
	branchiostygeal ray									3			
	ceratohyal								2	12	1		
	ceratobranchial								2				
	dentary	2		3		1		3	1	23	2	1	1
	ectopterygoid							1		4			
	epibranchials	1								5			
	epihyal									1			
	exoccipital									1			
	frontal	3		3				2		8		3	
	hyomandibular	1		1					1	13	1		1
	hypobranchials									3			
	hypohyals			1						3			
	interhyal												
	interoperculum	1											
	maxilla	3				1		2	1	25	2	2	
	nasal									1			
	operculum	1		1			1			5			
	opisthotic	1							1	1			
	otolith			1						17			
	palatine							1		4			
	parasphenoid	1						2		6			
	parietal			1				1		4			1
	pharyngeal plate									2			
	premaxilla			1				2		22	2	1	
	preoperculum	1		2			1	2		9		1	
	prootic									1			
	quadrate			1				3		11	1		
	sphenotic									2			
	suboperculum	2		2						1	1		
	supraoccipital									2			
	symplectic									2			
	vomer	3								5			
Pectoral girdle													
	scapula	1											
	post-cleithrum									5			
	post-temporal		1	3			1		1	20	2	1	
	cleithrum	4		4			4	2		35	3	1	
	coracoid									1			
	radials												
	supracleithrum	6		3				2		18	2	1	
	basipterygium									4			
Spine													
	atlas	4		1						1			
	vertebrae	24	8	9						75	2		
	thoracic vertebrae	26	8	12	2			7	2	28	11	1	
	precaudal vertebrae	45	26	26				5		71	17	2	3
	caudal vertebrae	74	18	18	3			20	1	273	20	2	1
	hypural									4			
	Total cod	209	61	100	5	2	7	58	13	756	67	16	8