FAUNAL ANALYSIS OF UPPER FORT GARRY: SOCIAL AND ECONOMIC IMPLICATIONS

by

Linda Seyers

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Master of Arts
in
The Department of Anthropology

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THE UNIVERSITY OF MANITOBA FACULTY OF GRADUATE STUDIES

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ABSTRACT

This thesis examines the faunal remains recovered from an archaeological site, Upper Fort Garry (DILg-21), located in Winnipeg, Manitoba. Excavations recovered two privy/refuse pits, located within the Hudson's Bay Company post. Over five thousand animal bones were recovered and analyzed. The objectives of this analysis were threefold: to reconstruct the pattern of animal utilization during the occupation of Upper Fort Garry, to compare this reconstruction with historical and archaeological records of animal use in the Red River Settlement, and to examine the relationship between diet and economic position.

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Excavations at Upper Fort Garry were carried out during the summers of 1981, 1982, and 1983 under the direction of Dr. Greg Monks, with Biron Ebell and Ellen Robinson as crew chiefs. The field crews consisted of students from the Universities of Winnipeg and Manitoba. The bones were identified using the faunal collections at the University of Manitoba, the Museum of Man and Nature in Winnipeg, the University of Toronto, and the Royal Ontario Museum.

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Chapter I

INTRODUCTION

In general, faunal analysis in archaeology played a minor role until the middle of the twentieth century. Bones, if collected and kept, were sometimes identified to species and added as an appendix to the back of the site report. Later, it was realized that one could learn more from bones than simply what kinds of animals were present. For example, information could be gained concerning the environment, climate, vegetation, subsistence and diet, and the date of the site through extirpated and extinct species, and the technology of the inhabitants of the site.

The situation concerning faunal analysis in historic archaeology was even less advanced. The first faunal report from an historic site was published by Parmalee in 1960 (Jolley, 1983: 64). Again, the reports took the form of basic laundry lists of species. As late as the mid-1970s comments such as the following were being made in the literature:

Time did not permit us to make a thorough study of these remains [fauna] and as this was certainly not representative of a total population, it was felt that there was no need (Hanson and Hsu, 1975: 164; in Jolley, 1983: 66).

Detailed identification and analysis of this quantity of bone would be a lengthy process and would not be of sufficient value to justify the time spent (Stephensen, 1974: 32b; in Jolley, 1983: 66).

At first [bone] was considered merely an unpleasant inconvenience. The bone was thrown out with no more than a

brief note on the unit-square-sheet that much animal bone was encountered in the excavation of that level (Brose, 1975: 78).

Only recently has faunal analysis been seriously undertaken in historical archaeology. These current studies are reflecting a new approach. Faunal analysts are studying species and their frequency to make statements about ethnicity, social and ideological systems, economic variability, and acculturation (Lyman, 1987).

In keeping with this trend, this study will investigate economic variability among the residents of the Red River Settlement as reflected by the faunal food remains.

The objectives of this study are threefold:

- To reconstruct the pattern of animal utilization during the occupation of Fort Garry with respect to the relative importance of species and butchering practices employed;
- To compare this reconstruction with historical and archaeological records of animal use in the Red River Settlement and surrounding areas during the mid-1800s; and
- 3. To examine the relationship between diet and economic position by identifying patterns within the reconstruction and subsequent comparisons which may reflect the economic position of the consumers.

1.1 LITERATURE REVIEW

There is a growing trend in archaeology towards the manipulation of data to investigate past social and economic relationships. Historic Sites faunal analysis has lent itself well to this kind of study, but results for the most part have been inconclusive due primarily to the smallness of the sample site. A variety of approaches have been taken.

Joanne Bowen (1975), working at Mott Farm, a rural farmstead in Portsmouth, Rhode Island, attempted "to define the social and economic context of the site and ... interpret the uses of domestic animals" (Bowen, 1975: 12). While providing a good description of the various economic uses of animals (breeding, milk, wool), she fails to interpret this information or to discuss it in terms of the social and economic context of the site as a whole.

Other descriptive studies were conducted by Brose (1967) and Balcom (1981). Brose (1967) looked at the refuse dump of the Fort Mackinac garrison at Mackinac Island, Michigan. The site covered a span of twenty years and a vast amount of material was recovered. Brose attempted to determine status differences between officers and soldiers. Although there are some comments regarding these differences, most of the attention is spent on identifying changes through time in the diet and relating this to the changes in the military importance of Fort Mackinac.

Balcom described the subsistence base for the occupants of Port Severn, discussing which foodstuffs were imported and which were obtained locally. She considers some analytical problems, such as garbage disposal patterns and why certain species are not represented in the archaeological sample.

Guilday (1977), working at Fort Ligonier, and Wilson and Southwood (1976), working at Fort George on the Niagara, deal primarily with analytical problems encountered by historical faunal analysts. Such problems include recognizing salt pork, beef, or mutton in the archaeological remains; whether the meat was processed without bones; and identifying the remains of animals slaughtered at the site as opposed to those slaughtered elsewhere and brought to the site.

In partial solution to these problems, Lyman (1977) analyzed butchering marks on domestic animal bones from Fort Walla Walla. This analysis revealed non-functional, possibly individual and functional variation in the butchering pattern (Lyman, 1977: 67). Lyman was able to identify a butchering pattern followed at the site which is different from that followed today. The butchering data also indicated that "cows, sheep and pigs were obtained in butchered form" (1977: 67).

The aforementioned studies provide good descriptions of the diets enjoyed by the occupants of the various sites. They also give consideration to some of the analytical problems encountered. However, little if no attempt is made at using faunal data to learn about the socioeconomic structuring at the sites. While Otto (1979) and Rathje and McCarthy (1979) have examined variations in social, ethnic, and economic position using ceramics and modern material culture (garbage) respectively, few researchers have made the attempt via faunal analysis. Reports in which this subject has been broached are discussed below.

Losey (1973) analyzed the remains from Fort Enterprise which was
Captain John Franklin's winter outpost. The goal of this study was to
elucidate the social division and cultural differences between the
officers (Englishmen) and the Canadian voyageurs (Cree-Metis). Losey
looked at the bone frequencies in different middens. Although there was
little documentary evidence concerning diet, there were indications of
social differences between the "Canadians" and the "gentlemen." Based
on the information gathered, Losey hypothesized that

If a cultural preference regarding the utilization of specific portions of caribou taken at Fort Enterprise existed between officers [Englishmen] and men [Canadians], then a concomitant difference in the relative distribution of caribou remains should exist between the two related middens (Losey, 1973: 137).

The results of this study, however, were inconclusive because the faunal sample was too small.

Herskovitz (1978) studied the dietary reflections of socioeconomic or class differences at Fort Bowie, a nineteenth-century U.S. army outpost in Apache Pass. He felt that the faunal data seemed "to indicate the purchase of more expensive cuts for the Army officers and less expensive cuts for the enlisted men" (Herskovitz, 1978: 137). The difference in price between different cuts of meat was influenced by culturally derived preferences and the physiological quality of the meat. In his discussion he considers the parts of animals in demand, butchering techniques, and the tools employed. The distribution of the bones is related to the spatial distribution of the buildings and their functions. He notes that in the bachelor officers' quarters, hind quarter meat cuts (the most desireable) predominate. In other areas of the fort, the front quarter cuts predominate.

Lesley Drucker (1981), using the same basic premises as Herskovitz, analyzed the household food remains from a slave occupation at Spiers Landing, South Carolina. He believed that the analysis of a household's food remains could be an important tool in defining economic status (Drucker, 1981: 62). He found that at the Spiers Landing site seventy-five percent of the faunal assemblage was composed of poor quality meat cuts (metapodial, hoof, and cranial elements). The majority of the high quality meat elements were from wild resources and not from domesticated resources. No inter-site comparisons were made and hence no standardized patterning was identified.

Two reports dealt specifically with socioeconomic and sociocultural variability. In "Diet and Foodways of Eighteenth-Century Spanish St. Augustine," Reitz and Cumbaa (1983: 151-227) were interested in studying how social status, ethnic traditions, and acculturation processes were reflected in faunal remains. In their preliminary research, the authors conducted a literature search for references as to the diet of people in the St. Augustine community, available food resources, and the traditional diets of people in Spain, New Spain, and the southwestern United States. The faunal remains from six households of known status were examined. In the analysis, Reitz and Cumbaa examined the diversity of species and the cost expenditure involved in killing and preparing the various species.

Definite differences were found within the faunal assemblages for the six houses. In general, there was a "clear selection in favor of species that could be exploited using mass capture or intended devices,

providing a good return for minimal efforts" (Reitz and Cumbaa, 1983: 1979).

Domestic animals made up the largest percentage in all of the assemblages. However, it appears that upper class (Criollo and Peninsular) families used the most wild terrestrial biomass, while Mestizo families used the least. The middle class families enjoyed more access to the domestic fauna. Marine resources were utilized more by Mestizo families than by the upper class, hispanic families.

The diets of all three groups showed adaptations to the new environmental conditions. "The Indian woman's household deviated from a purely aboriginal diet with the incorporation of several different habitats" (Reitz and Cumbaa, 1983: 181). The Criollo and Peninsular diets showed substantial modifications from the Old World pattern in that there was a definite preference for cattle and pigs as opposed to sheep. As well, there was an increased use of wild terrestrial species and the addition of domestic reptiles (Reitz and Cumbaa, 1983: 181).

In this analysis, the differences in species use were interpreted as reflective of status differences. The upper class diet was found to be more expensive to maintain given the local environment. No work was done on the aspect of cost and "quality" with regard to eighteenth-century standards as indicated by different carcass portions.

Another report by Shulz and Gust (1983) dealt extensively with economic position. The authors excavated residential and mercantile sites from nineteenth-century Sacramento and used the faunal remains to examine butchering units and costs of nineteenth-century beef cuts.

The resultant ordinal ranking of cuts ... was then used to assess the economic value of the meat represented by the faunal debris in the ... deposits and to determine the accuracy with which this mirrors the relative socioeconomic placement of the depositing populations, as determined from the historical record (Schulz and Gust, 1983: 48).

They worked with a good sized sample of butchered cow bone and were able to show variations in cut frequencies among the four identified sites. However, they interpreted these economically-based differences in terms of social positioning without providing the theoretical rationale. At a more basic level were problems with their analytical methodology. In all calculations, the number of identified specimens was used; no attempt was made to determine the minimum number of times each beef cut was represented. The number of bones in each type of beef cut varies; frequencies per cut may be skewed depending on the number of bones in each type of cut (Lyman, 1987: 59-60).

To summarize, the reports to date have documented several approaches to study the relationship between the faunal material and the social and/or economic position of the consumers. The work done by Balcom (1981), Bowen (1975), Brose (1967), and Lyman (1977) are all basically descriptive in nature, outlining species utilized, body portions preferred, and changes in diet over time. Others, such as Losey (1973), Herskovitz (1978), Drucker (1981), Schulz and Gust (1983), and Reitz and Cumbaa (1983) were more practical in their application, taking archaeological collections and attempting through quantification to give more insight into diet, economic position and social position. Special attention was paid to butchering techniques, the quality of meat represented by the cuts, and the expense of these cuts. Analytical

problems encountered and theoretical implications concerning osteo-archaeological methods and interpretations were considered by Guilday (1978), Wilson and Southwood (1976), and Uerpmann (1973).

The review of literature pertaining to faunal analysis and its role in historical archaeology clearly illustrates the theoretical and methodological advances which have been made in this field over the past twenty years. Of particular importance is the use of faunal analysis in exploring the socioeconomic structuring of society. However, it is also apparent from the literature that much work still needs to be done. Problems of sample size, data interpretation, and accurate economic assessment must be overcome.

1.2 THEORETICAL ORIENTATION

Archaeology is a subdiscipline of anthropology; both have as their ultimate goal to better understand human behavior and cultures. Unlike anthropology, however, which deals with living people, archaeology concerns itself with the material remains left by people.

One of the major premises in archaeology is that "specific patterns in behavior can be directly related to specific patterns in material culture" (Rathje and McCarthy, 1979: 261). As Binford so aptly says, "we cannot dig up a social system or ideology which functioned together with [the] more behavioral elements within the appropriate cultural subsystems" (Binford, 1962: 218-219).

On the other hand, some archaeologists (Hodder, 1982; Schuyler, 1978) believe that human behavior and its relationship to depositional patterns is not the best approach, perhaps one should look at their symbolic associations. Although artifacts are the primary unit of archaeological research, they cannot be studied as an entity separate from meaningful cultural context. The premise behind the contextual approach is that "a society is made up of interrelated parts and we can explain one component by showing how it works in relation to other components" (Hodder, 1982: 2). Within this approach, "material culture can be examined as a structured set of differences. This structured symbolizing behavior has functional utility, and it must be understood in those terms" (Hodder, 1982: 7). These structures and symbolic associations derive their meaning from the cultural context.

The concern must be to examine the role of material culture in the ideological representation of social relations. Excavated artifacts are immediately cultural, not social, and they can inform on society only through an adequate understanding of social context ... The daily use of material items within different contexts recreates from moment to moment the framework of meaning within which people act (Hodder, 1982: 10).

Schulyer (1978: 30) suggests that historic sites archaeology can be used in social, economic, and ideological interpretation. He defines historical archaeology as "the study of the material remains from any historic period [that is] a period in which the cultures in question have a documentary record and that writing is having a full impact both on the cultures being studied and on the scholarship of the investigation" (Schulyer, 1978: 27). On the other hand, historic sites archaeology is "the study of the material manifestation of the expansion of European culture into the non-European world starting in the 15th

century ending with industrialization of the present depending on local conditions" (Schulyer, 1978: 28). Thus, it deals with a specific historical subject that has temporal, spatial, and cultural boundaries.

Hence, both historical and historic sites archaeology have control over artifactual data as well as documentary data. In this sense, they are more holistic than history or prehistoric archaeology because the traditional data bases are broader (Schulyer, 1978: 28). This increases the archaeologist's explanatory power of observations and interrelationships, thereby strengthening the explanations within the contextual framework.

For these reasons, a contextual approach is perhaps the best means for assessing and explaining economic variability. The faunal material was selected for this analysis for several reasons. Firstly, a large amount of bone was recovered, it was in excellent condition, and data control was good. Secondly, food remains provide an excellent data base from which to study economic structuring. Diets are universally characteristic in that they are culture-specific and sometimes even specific to different members within a culture group. To coin a phrase, "one is what one eats" (Wing and Brown, 1979: 11). According to Daly,

The remains of food animals have passed through the cultural filter ... They do not constitute a chance assemblage, nor is their presence in the site due to anything but human behavior (Daly, 1969: 146).

A number of factors influence the selection of animals to be exploited for subsistence. Firstly, there are culturally determined preferences. This includes such things as political regulations or

ceremonial food taboos. Secondly, individual tastes play a role in the selection of foodstuffs. Thirdly, there are a number of economic factors which come into play. It is this idea of economics which is extremely important. Economics is defined as "the study of human behaviour as it relates to scarce means, which have alternative uses; to given ends, such as maximization of income, usually employing price data in the comparison" (Gould and Rolb, 1964: 227).

If food items are viewed as economic goods - that is, they are useful, scarce and command a price in the market (Gould and Rolb, 1964: 227) - they should reflect the socioeconomic position of the consumers. One can hypothesize that people belonging to a higher socioeconomic level may be able to enjoy a diet which is more expensive to maintain given the local environment (Reitz and Cumbaa, 1983: 159).

Expense may be calculated either as spending money to purchase food [and] hire the services of a hunter or fisherman or as expending calories to do the task personally. [Thus] prestigious foods might be those difficult to obtain because of monetary expense or because of caloric cost (Reitz and Cumbaa, 1983: 159).

In the archaeological evidence, this may be expressed through observable differences in the cuts of meat represented, the species represented in the sample, and the age of the butchered animal.

A trip to a local supermarket is evidence enough as to the variety and types of meat cuts and the corresponding prices. Whatever the reason, whether it be a better "grade" of beef or an item in high demand but with scarce supply, some cuts cost more to obtain. One may assume that the same thing happened in the past.

Bones can be classified into three grades:

- The vertebral column (excluding the tail), upper leg bones and bones of the shoulder and pelvic girdle; these are the muscular parts of the body with high value meat;
- 2. The lower leg bones and skull (with brain and jaw musculature) and mandible (jaw musculature and tongue), ribs and sternum; medium value meat; and
- 3. face bones, tail, feet (including ankle joints); lowest value meat. (Uerpmann, 1973: 310).

Drawing from this classification it can be postulated that since retail meat cuts from different sections of the carcass are differentially ranked economically, the frequency of consumption of differently-priced cuts will vary with economic class of the consumers (Schulz and Gust, 1983: 45).

The types of species and the range of species represented in the sample may reflect economic positioning.

Higher diversity may reflect either the wealth needed to purchase a wide variety of foods or the ability (or necessity) to exploit directly a wide variety of natural resources through familiarity with local conditions (Reitz and Cumbaa, 1983: 160).

Where a high diversity is found in lower socioeconomic sites, the majority of high quality meat elements should come from wild resources, suggesting that a significant portion of the most nutritious meat would be obtained from hunting and fishing (Drucker, 1981: 63).

Husbandry practices may reflect aspects of the economy, assuming that the age of slaughter can reflect differences in the quality of meat (Jolley, 1983: 73). Meat from young animals tends to be more tender and

succulent, and thus more desirable. However, the gross amount of meat product is less than from an older, larger animal, so in general the meat is more expensive to produce and purchase. The frequency of consumption of differently-priced cuts from younger as opposed to older animals, therefore, will vary with the economic position of the consumer.

Using these techniques, it is possible to assess the economic value of the meat represented. However, "the accuracy with which this mirrors the relative [economic] placement of the depositing populations must be determined" (Schulz and Gust, 1983: 48).

Several analytical problems must be dealt with. For instance, how does one identify pemmican, dried meat, and salt pork/beef in the archaeological remains? "Pemmican is made from meat that has been dried and beaten, then mixed with berries, tallow or fat" (Walker, 1982: 62). Therefore, in its edible form, no bones would be included, and thus no remnants would be found in the archaeological record. The same problem exists when dealing with salt pork. The literary evidence is of no help in clarifying this situation, as the sources often conflict. Concerning Fort Ligonier, Guilday said that salt pork left no archaeologically recoverable trace, implying that the meat was boned before it was barreled and that any pig bones found could mean either living animals or dressed carcasses (Guilday, 1977: 131). On the other hand, a document dating from 1766 from the commissary's office at Quebec states "it is your business to see that there are not too many hocks among the pork, four is as many as ought to be in a barrel" (Wilson and Southwood, 1976: 125).

Assessing the economic importance of individual species to the consumer's diet poses another problem. Simple bone frequencies, while providing the number of bones per species, are inaccurate indices of dietary importance (Grayson, 1978). It would be foolish to conclude that because the same number of rabbit and cow bones are present in a given sample that both contribute the same amount of nourishment to the diet and are thus of equal importance. "The value of a count of pieces per species is limited by the different meat quantity represented by each species and the nature of the fragmentation of its bones" (Uerpmann, 1973: 310).

Calculating biomass is an alternative procedure (Ewen, 1986). This technique involves using the weight of the archaeological bone in "an allometric formula to derive a proportionate quantity of biomass for the skeletal mass recovered" (Reitz and Cumbaa, 1983: 168). The degree of fragmentation of the bone is not a problem as it does not affect the accuracy of the measurements. However, the resulting biomass measurement "has no direct relationship either to original total body weight of the animal or to the portion of that total body weight consumed" (Reitz and Cumbaa, 1983: 168). Also, the weight of buried bones can change through time; thus, if burial conditions are different incorrect results may be obtained (Uerpmann, 1973: 311).

Determining the contribution of individual species to the consumers' diet and thus its economic importance is perhaps best done using a combination of methods. The calculation of the minimum number of individuals represented in a sample in conjunction with the

determination of edible meat estimates (White, 1967) can indicate the relative importance of each species. This estimate, while in proportion, will be grossly too low. One must also note that the difference between the number of finds and MNI increases as the size of the sample increases. Thus, samples of a similar size should only be used for comparisons (Uerpmann, 1973: 311).

Secondly, by identifying the body segment and the type of butchering cut, it is possible to assess the quantity of meat supplied. This can be done by classifying the bones into grades - parts of the body with high, medium, or low meat value, for example. This will provide a relative scaling of importance which can be used to assess economic value. This technique is especially effective where retail cost of meat cuts is known. The economic value of the meat reflects the consumption behaviour of the consumer.

At this point, it is appropriate to consider if and how economic position, as reflected by the economic variability in an archaeological deposit, can be related to social variability. In this thesis, the term "socioeconomic position" has been avoided.

While this term and its synonyms (socioeconomic status, social status, and class differentation) connote some common-sensical notion about a person or group of persons' ascribed or attained position within a society relative to the positions of other members of that society, the concept seems sufficiently ambiguous in zooarchaeological contexts to be of limited and obscure explanatory value. (Lyman, 1987: 58).

By considering economic position and social class separately, it is possible to discuss the characteristics of each and examine their relationship. "Class" is an analytical category that may be applied to

arbitrarily defined groups. There are two types of classification possible: objective and subjective.

Objective classification proceeds on the basis of directly measurable criteria such as income, property, education, occupation, and position of responsibility or power. Subjective classification uses popular evaluation criteria, usually via polls, and assumes the ordering of units by prestige rather than wealth or power (Monks, 1988).

The two types of classification are related because subjective judgements are based on objective criteria. According to sociologists, the objective criteria of class membership are variables such as income, occupation, property ownership, and education. All the objective criteria of class membership reflect objective economic differences between the analytical units (Monks, 1988).

Through archival and historical documents, it is possible to detect occupation and income as defining criteria of economic classes.

Consumption and expenditure values are highly correlated with both occupation and income and can be used to detect prestige classes (i.e. social position or class). Thus, given the tight correlation between economic and prestige classes, and given the ability of prestige indices to reflect broad occupational groups, it is relatively safe to argue that prestige classes detected archaeologically correspond more or less directly with economic classes as described in historical documents on the basis of both occupation and income (Monks, 1988).

1.3 AIMS

This thesis will attempt to overcome the problems encountered by researchers in earlier studies, namely problems of sample size, data interpretation, and accurate economic and social assessment of the data. Over 5,000 bones will be identified and analyzed over the course of the thesis. This represents a sample size of over seventy percent; any results, therefore, should be statistically significant. A thorough examination of the social and economic structure of the Red River Settlement (RRS) and the Hudson's Bay Company (HBC) will be conducted. This extensive research should provide an excellent understanding of the time period and society in question, thereby allowing a more accurate interpretation of the cultural context from which the faunal collection was derived.

The bones will be identified as to species, noting anatomical elements and cultural and natural modification. Butchered bones will be closely analyzed with each bone being assigned to an appropriate meat cut. The minimum number of each meat cut represented will be calculated. Further archival research will be conducted to determine the economic value of each meat cut in the RRS market during the time period in question (1840s) and the faunal sample will be evaluated and interpreted using this data.

This approach allows for the collection to be interpreted within a cultural and temporal framework. Using the minimum number of cuts provides a more accurate picture of the makeup of the faunal sample than working with the number of identified specimens. This approach also

lends itself quite easily to an economic analysis. The meat yield per cut will not be calculated, nor will the cost-efficiency of each beef purchase, because it is not possible to demonstrate empirically that they are tightly correlated to purchasing power, income level, or economic class (Lyman, 1987: 62).

The major contribution this thesis hopes to make is at a methodological level. Although the historical data accumulated will be site-specific and temporally limited, a framework for the economic analysis of faunal samples will be established.

Chapter II

HISTORICAL BACKGROUND

This chapter will examine the development of agriculture and animal husbandry in the Red River Settlement during the period 1812, the beginning of Selkirk's colonization at Red River to 1850. This terminal date was selected for two reasons: it marks the introduction of farm machinery to the Valley and the privy deposits have been artifactually dated to the Sixth Regiment of Foot's stay at Upper Fort Garry from 1846 to 1848.

This chapter will also discuss the social context within which the artifactual data could be analyzed and outline the development of social and economic groups in the Settlement and Company. Special note will be made of the subsistence strategies of the community giving the kinds of food available locally for consumption.

2.1 AGRICULTURE IN THE RED RIVER SETTLEMENT

The British selected the junction of the Red and Assiniboine as the focal point of their fur trade operations in North America using it as the major administrative and supply point for outlying posts (Murray, 1967: 13-16). The development of agriculture in the Red River Valley was a logical step in the struggle for control of the Fur Trade.

In 1811, the Hudson's Bay Company accepted Thomas Douglas, Fifth Earl of Selkirk's proposal to establish a colony near the forks of the Red and Assiniboine Rivers (Miquelon, 1970: 10). Selkirk "wanted to resettle small farmers who had been forced off their land in Scotland and he believed that these settlers could provide agricultural supplies that would improve the position of the HBC in its struggle with the NWC" (Murray, 1967: 16-17).

The years immediately following saw several developments. The population increased substantially with the influx of settlers. The North West Company merged with the HBC in 1821 leaving the amalgamated Company in control of the major trade network in British North America and the United States. The Company sought to regulate and to discourage any private trading done with the United States outside the realm of the Company.

Although the HBC had helped to sponsor the first farming settlers in the valley, they soon realized that an expansion of agriculture would be detrimental to the fur trade (Murray, 1967: 21). Thus the Company discouraged additional immigration and hindered large-scale export of farm produce. They also encouraged the Metis to supply pemmican for fur trade operations thus reducing the local market for farm surpluses (Murray, 1967: 17).

In addition to the discouragement from the HBC, the settlers had to deal with locusts, early frosts and floodings. The flood of 1826 was especially trying, however, after the water receded the Settlers struggled to re-establish themselves.

A system of land distribution was developed with the arrival of the Selkirk Settlers. They were provided with ninety acre lots which measured 660 feet wide by 1.8 miles in length, and were allowed access to a ten acre wood lot on the East Side of the Red River (Murray, 1967: 35). Twenty four such lots were issued. The remainder of the lots in the Settlement were surveyed after Selkirk's death in 1820. These lots were of the pattern established in the St. Lawrence Valley and measured 660 feet wide by one and one-quarter mile. "The owners of river lots had the right to cut hay on the prairie for two miles beyond their surveyed lots. When the HBC took over the Selkirk estate in 1836, it resurveyed all of the lots at Red River and left them intact" (Murray, 1967: 35).

Not all land was purchased from Selkirk. In return for years of service, the HBC granted 100 acres to many of its employees (Murray, 1967: 35). Settlers of British descent lived primarily north of Upper Fort Garry but south of the Indian colony at St. Peters. The French Canadians inhabited St. Boniface where they rented land from the Catholic Church or took over lots along the Seine River, which had been abandoned during the 1826 flood (Murray, 1967: 35). The Metis occupied lots along the River, south and west of Fort Garry, in the Pembina Valley and in St. Boniface. Few actually owned lots but occupied them exercising squatter's rights (Murray, 1967: 35).

Although the market for agricultural produce was never large, the Settlers were able to establish and support themselves as well as supply the fur trade with staple crops. It took many years to reach this state of self-sufficiency.

The first crops were planted unsuccessfully in the spring of 1813 (Sprague, 1983: 19). In the following year spring wheat, barley, oats, Indian corn, buckwheat and 300 kegs of potatoes were sown. The potatoes grew well, but the remainder of the crops yielded only seed for the following year (Morton, 1967: 50). Seed wheat was obtained from Fort Alexander in 1813. This seed probably originated in Canada or the British Isles but "by 1819 nearly all of it had been lost. On June 5, 1820, 250 bushels of seed wheat were brought into the RR from Prairie du Chien and were sown at once" (Morton, 1967: 74). This strain of wheat proved to grow well and became the standard Red River wheat (Morton, 1967: 74).

The lack of adequate farm implements further limited agricultural pursuits.

The facilities for farming were not of the best. The implements (the spade and the hoe for planting and sowing) were as primitive as well could be...The reaping was done with the sickle and later on with the cradle (MacBeth, 1897: 2).

In fact, prior to 1824 there were no plows in the settlement. From 1825 until 1850 wooden ploughs with iron points and wooden mould boards were utilized, however, they were not very efficient in the thick and heavy Red River Valley soils (Sprenger, 1972: 163; Murray, 1967: 38). Cast iron plows, mechanical reapers and threshers reached the Red River Settlement in the 1850s but were few in number (Sprenger 1972: 163). Before 1850,

men cut grain by hand and women and children tied it into bundles with willow withes. The bundles were shocked (or put into 'stocks') in the field and then were hauled into the barnyard and stacked. Threshing was done with hand flails or by the trampling of animals. The most common surface for threshing was a level 'ice floor', although farmers who had wooden floors in their barns threshed in doors and did not have to delay this operation until winter (Murray, 1967: 38).

The settlers did not limit themselves to raising crops alone. Animal husbandry played a very important role in each farmer's subsistence operations (Murray, 1967: 39). Livestock of the Settlement included cattle, pig, sheep and horses (Table 1).

TABLE 1
Census of the Red River Settlement, 1831 to 1856

	1831	1834	1840	1849	1856
Population	2390	3356	4280	5391	6691
Acres Tilled Acres Tilled	2152	3230	3953	6392	8806
per Person	0.90	0.96	0.92	1.2	1.3
Houses Stables Barns	375 265 134	567 469 211	614 621 254	745 1066 335	933 1191 409
Horses Oxen Cattle Calves Pigs Sheep	410 958 1194 801 362	630 1708 2084 1211 2053	1251 1793 3847 1984 1888	2085 2252 2147 1605 1565 3096	2681 3152 3679 2784 4929 2429
Plows Harrows Carts Wind Mills Water Mills	187 243 302	275 353 608	396 457 1351	492 576 1918 18 2	590 672 2108 18 9

There were also 8 threshers, 2 reapers, 6 winnowers, and one steam mill in the settlements in 1856.

Source: Murray, 1967.

Cattle were by far the most important and most numerous livestock.

Cattle were introduced into the Settlement by 1813 at the latest.

Mention is made in 1813 of Peter Fidler bringing with him a bull, cow and yearling heifer he had purchased from the Nor'westers for the Colony (Morton, 1967; 48).

Importing significant numbers of large animals such as cows, pigs and sheep from England via Hudson's Bay or from Canada via Rainy Lake proved to be an extremely difficult task. Therefore, only a few animals were brought into the Settlement by these routes (Sprenger, 1972: 165). The United States was relied upon instead as the primary supplier of livestock to the Settlement.

In 1822, approximately 300 head of cattle were brought from the Mississippi Valley by Governor Bulger (Morton, 1967: 66). These animals were of a "non-descript stock that was well-adjusted to frontier conditions and could be broken to the yoke easily" (Murray, 1967: 41). Attempts were not made to improve the stock by breeding practices.

For want of care, our cattle are deteriorating fast in size, although costly bulls, and of the finest breed, both from England and the U.S., have been imported into the colony. The local government has taken no steps to restrain a multitude of dwarfly bulls from running at large in all seasons, to the great injury of the breed; and as one evil generally begets another, the large oxen keep at bay the small bulls and not only destroy the cows, but injure themselves into the bargain (Ross, 1856: 390).

Little or no attempt was made to shelter livestock during the long cold winters. In 1850, an agricultural association was formed to encourage stall-breeding and better livestock practices (Ross, 1856: 389). However, prior to 1870, both good cattle and experienced cattlemen were the exception in the RRS (Murray, 1967: 41).

Pigs were also an integral part of the livestock in the valley.

Records indicate that in 1819, there were seventy pigs in the

Settlement, by 1834, there were 2053. This number decreased slightly as the market for pork was limited by the extensive use of pemmican. Swine production resumed after 1849 (Murray, 1967: 41).

Twenty Merino sheep were introduced into the Settlement in 1812, however, they did not survive (Murray, 1967: 41). Sheep production was not attempted again until twenty years later. In 1832, an expedition, headed by W. Glenn Rae, left Fort Garry for Kentucky where they purchased approximately 1300 sheep. During the long trip back many of the animals perished. Upon their return on September 16, 1833 only 259 had survived (Hutton, 1921: 10-12). Despite the harsh climate and attacks from dogs and wolves, the sheep prospered in the Red River Valley increasing to over 4000 by 1846. However, production of mutton and wool never became a major part of agricultural pursuits with the HBC limiting the market of both products (Nor'wester, Mon. May 14, 1860).

Horses were kept in the Settlement and used primarily for transportation and freighting purposes. They were also used extensively for the bison hunt. As stated previously, oxen were used for field work.

Today the Red River Valley is a major agricultural centre. Its potential was definitely realized early in the nineteenth century however, extensive exploitation was slow in occuring.

Although an unlimited amount of land was available for the taking, nearly all settlement and farm operations remained concentrated in the narrow river lots. The extent of land use increased very slowly (the area tilled per person increased to

only 1.3 acres by 1856), the quality of crops generally failed to meet export standards, and the livestock population remained at little more than a subsistence level (Murray, 1967: 44).

It is quite apparent that the economy of the Red River Settlement stagnated as soon as the settlers were capable of producing a surplus of agricultural goods. This state could have been rectified by an expansion in the local population or by locating and supplying an outside market. The HBC however, discouraged both options because they were inconsistent with its priorities, namely, making a profit in the fur trade.

Thus, the Settlers produced enough to support themselves and the limited needs of the HBC. "The plight of three experimental farms indicates that even when liberally subsidized, early Red River Agriculture was limited by human shortcomings and the conditions that existed within the settlement area" (Murray, 1967: 45).

The first model farm was established by Lord Selkirk in 1817. He hoped to provide the fledgling agricultural colony with seeds and extra food supplies. The project succumbed in 1822 to the infestations of grasshoppers, shortages of draft animals, seeds and equipment (Murray, 1967: 45).

The second experimental farm was set up by the HBC in 1831 under the direction of Robert Campbell. This operation was to serve as an example for the Settlers and hopefully, to help them produce superior products. Campbell was an experienced farmer and under his direction it is possible that such a venture might have succeeded. However, Campbell

left in 1832 to go to Kentucky and buy sheep for the farm. Chief Factor McMillan, a fur trader by occupation with no agricultural experience, was left in charge. The Metis servants appointed to the farm were also inexperienced. Ross (1856: 134-135) states: "Their extent of the skill consisted in having seen wheat, barley, and potatoes raised, and that in the simplest and rudest manner." Predictably, the farm failed. In 1837, the HBC sold out at a loss (Murray, 1967: 45-46).

The HBC sponsored another farm in 1836 (Ingram, 1970). In March of that year, the Governor and Committee of the HBC wrote to Simpson:

It is highly desireable to establish an Export trade from the settlement, as a source of revenue from England, and as the country appears to be well adapted from rearing sheep and Black Cattle, and for the growth of Flax and Hemp... we have therefore determined on establishing a farm on a large scale... (Guinn, 1980: 68).

The farm was intended to serve as an example for the settlers and to help them adopt modern agricultural practices in order to eventually produce crops appropriate for an export trade (Ingram, 1970: 47). Once again, due primarily to inexperienced supervision, the farm failed. Captain George Marcus Cary and a number of farm servants were sent from England to set up the farm at the site selected by the Committee, which was on the low grounds on each side of the New Establishment at the Forks (Guinn, 1980: 68). After two full years of operation only 20 acres had been cultivated, and they were "raising wheat, barley, potatoes, and turnip-articles which every one in RR had for sale, and for which there was no market" (Ross, 1856: 213). Operations were reduced in 1840 when it was decided to maintain it solely for the sake of having a Company owned farm in the colony (Ingram, 1970: 49).

Thus, agricultural pursuits in the Red River Valley developed and expanded slowly. The early settlers had to contend with floods, droughts, frosts, insects, inadequate equipment and poor storage facilities. There was also no market in which to sell their goods and what little market there was, was controlled by the HBC. Under these adverse conditions the Settlers managed to produce food for themselves and supply the fur trade. However, due to the constraints listed above this chain of supply proved at times to be inadequate.

"The chief reliance of the colony for food lies in its agriculture, its Plains hunts, and its fisheries. The rabbits in the woods in winter, and the spring and autumn goose hunts, also offered temporary sources of supplies" (Hargrave, 1871: 175). The goose hunt was a biannual event occurring during the spring and fall migration of the birds. Much public interest was generated at these times (Hargrave, 1871: 173).

Autumnal fisheries on Lakes Manitoba and Winnipeg provided the Settlement with a copious source of food. Although the lakes abound with fish, whitefish and sturgeon were chiefly exploited. During the summer months, fishing was also done on the Red and Assiniboine rivers where goldeyes, catfish and a few sturgeon were caught (Hargrave, 1871: 177).

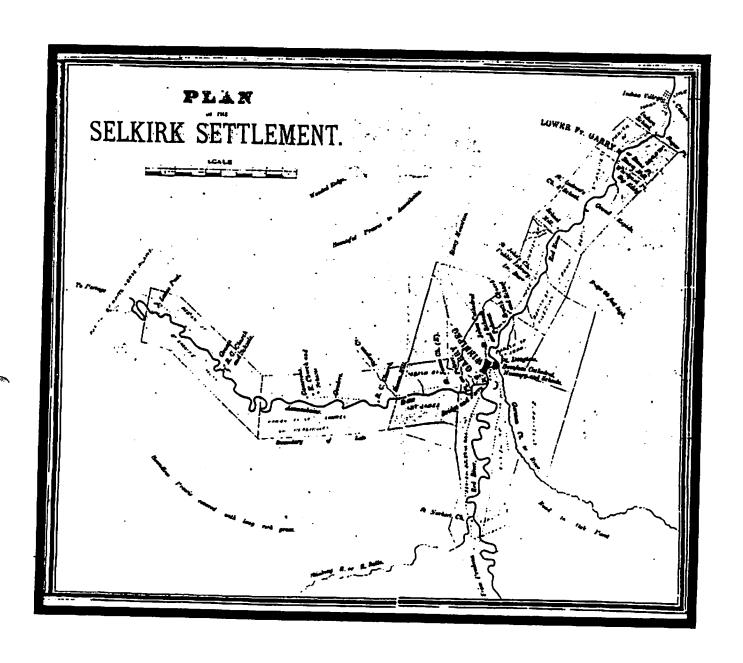
2.2 SOCIAL AND ECONOMIC STRUCTURE: HBC AND RRS

The preceeding section outlined the economic pursuits of the Settlers and their agriculutural relationship with the HBC. However, to better understand the social context within which the artifactual data could be examined one must also comprehend the social and economic structure of both the Red River Settlement and the HBC.

The social structure of the Red River Settlement was hierarchical in nature. Defining characteristics were primarily ethnic identity, religion and occupation.

The Red River Settlement was composed of a number of ethnic groups. The members of each group tended to congregate together and settle in distinct areas of the community. The Scottish and English or Anglican Protestant settlers lived along the Red River between Upper and Lower Fort Garry in what eventually became the parishes of St. John, Kildonan and St. Paul, St. Andrew, respectively. The French Canadians lived in St. Boniface, as did the Swiss and Demeurons homesteaders, who settled primarily along the Seine River. The Metis lived in the Settlements of White Horse Plains and St. Francois Xavier and also moved to the areas abandoned by the Swiss and Demeuron, after the flood of 1821, namely St. Vital and St. Norbert (Sprague and Frye, 1980: 180). North of Lower Fort Garry was located the Indian Settlement of St. Peter's (Figure 1).

Although often denied by the Red River Settlers, there appear to have been ethnic prejudices which helped to maintain the spatial boundaries. For example, MacBeth (1897: 51) states: "no caste or color lines were



Hand coloured print: 21,4 x 25,9 cm.; 1:253,440

Inset on "Laurie's map of the North-west Territories.... Compiled by D. Codd, Ottawa Entered according to Act of Parliament of Canada, in the year 1870 by D. Codd, in the office of the Minister of Agriculture Roberts, Reinhold & Co., Lith., Montreal".

Figure 1: Plan of the Selkirk Settlement (Artibise and Dahl, 1975: 10)



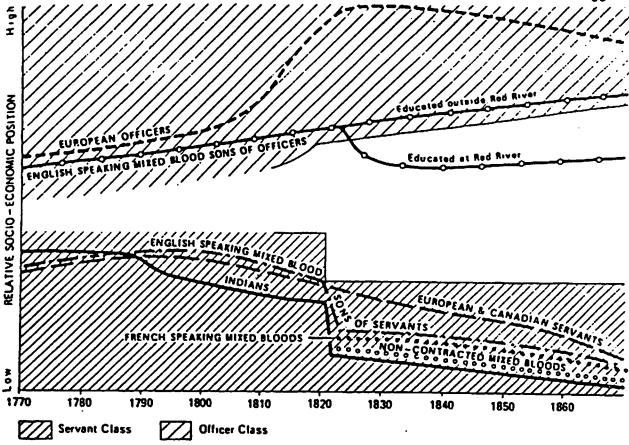


Figure 2: Relative Socioeconomic Positions in the HBC Fur Trade Hierarchy (Judd, 1980: 309)

I could get [my well-educated son] in the Cos service, but halfbreeds as they are called has no chance there nor are they respected whatever their abilities may be, by a parcel of upstart Scotchmen, who now hold the power to control in the concern (James to John Sutherland, Red River Colony, 10 Aug. 1846).

A new rank of apprentice postmaster was introduced in 1839 and formally admitted through the minutes of the Northern Council in 1844. Although not developed to accommodate local mixed bloods, during its use in the 1840s and 50s, all but one of the twenty one people appointed to the position of apprentice postmaster were identified in the engagement records as "native" and of those, nineteen were sons of chief factors

and chief traders (Judd, 1980: 312; Sprague, 1983: 20). Apprentice postmasters signed on for five years at £30 to £50 per annum if the individual was considered capable of becoming a clerk (Judd, 1980: 312).

The rank of apprentice post master clearly demonstrated the discrimination within the HBC. As stated this rank was filled almost exclusively by mixed blood sons of officers. Not only was their training period considerably longer than that of European clerks but their starting pay was significantly lower.

In protest against this rank James Anderson (1857) wrote:

These young men are generally the sons of your oldest and most faithful officers and on an average are fully as talented and well educated as the apprentice clerks from Europe and Canada and tho' they do precisely the same duty they are degraded to a lower rank, pay and allowances. This glaring injustice must-unless they be more than human beings rankle in the minds, particularly in the minds of those of high spirit and superior ability (P.A.C. James Anderson Papers MG19 A19, McKenzie River District Report 1857: 127).

As illustrated, the HBC labour system was fashioned in a rigid pyramidal hierarchy composed of three distinct parts: officer, permanent servants and part-time or short-term workers. This hierarchy was supplemented by informal ranking mechanisms characterized by criteria that measured one's male worth, country (experience in Rupert's Land), and European skills, and kinship connections (Hamilton, 1985: 26). Inherent in these criteria were prejudices, the most blatant of which were ethnicity and religion.

The HBC was undeniably the most vital economic force in the RRS. The Company was the largest employer within the community and as such its

employment hierarchy extended into the RR society. As a result "an individual's status in the community was closely related to his status in the company" (Judd, 1980: 314). In fact, the hierarchies within the HBC and RRS were structurally similar with several common defining variables such as occupation, ethnic identity and religious affiliation (Figure 3). The two hierarchies complimented each other and were interwoven at a variety of levels.

The Selkirk Colony was, for the first decade of its existence, under the direct management of Lord Selkirk. After his death in 1820, this responsibility fell into the hands of Selkirk's executors. They transferred the government of the colony's affairs into the hands of the HBC, who were able to purchase absolute rights about 12 years later (Ross, 1856: 170).

In an attempt to organize and maintain order within the growing colony, the Company imposed local regulations, courts of justice and a code of laws. A legislative council was established to make and enforce laws in both criminal and civic matters. Important members of the colony were selected as councillors with the Governor-in-chief at their head. These men, while undoubtedly being the most influential within the Settlement, were strongly associated with the Hudson's Bay Company. Table 2 lists the men who comprised the Council of Assiniboia; all were either sinecurists or paid servants of the Company (Ross, 1856: 174).

The position of "Recorder of Rupert's Land" was also created in the 1830. Judge Adam Thom was appointed Recorder by the HBC and received a salary of 700 sterling per annum. Thom fulfilled the duties of a

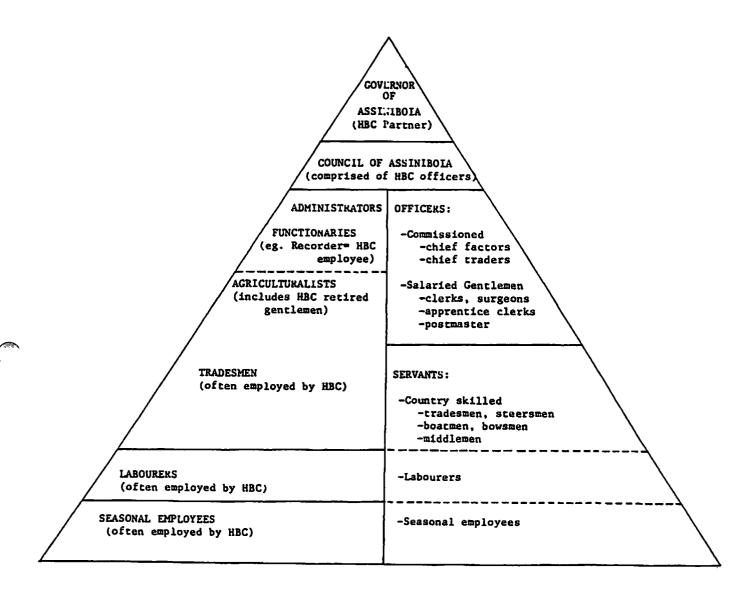


Figure 3: Comparison of RRS and HBC Organization, mid-1800s (Compiled from Hamilton, 1985, Judd, 1980, and Goldring, 1979)

TABLE 2

Constitution of the First Council of Assiniboia

President Sir George Simpson, Governor of Rupertsland

Councillors Alexander Christie, Governor of Assiniboine

(the colony)

The Right Reverend the Bishop of Juliopolis,

now of the NWC

The Reverend D.T. Jones, Chaplain to the

Honorable HBC

The Reverend William Cockran, Assistant Chaplain

James Bird, esq., formerly Chief Factor, HBC

James Sutherland, esq.

W.H. Cook, esq.

John Pritchard, esq.

Robert Logan, esq.

Alexander Ross, esq., Sheriff of Assiniboine

John McCullum, esq., Coroner John Bunn, esq., Medical Advisor

Andrew McDermot, esq., merchant

Cuthbert Grant, esq., Warden of the Plains

"recorder" per se, as well as judge in the colony. The dual nature of this role and the appointment of Thom caused much concern in the colony and a number of objections were raised. Thom could not speak French, which was the language spoken by the majority of the population, and he was a paid servant of the HBC.

A man, then, placed in Mr. Thom's position, liable to be turned out of office at the Company's pleasure, naturally provokes the doubt whether he could, at all times, be proof against the sin of partiality. Is it likely he could always take that impartial view of a case that might involve in its results his own interest, or deprive him of his daily bread? (Ross, 1857: 224-225).

The structure of the RRS and HBC as outlined changed over time. The HBC was not able to maintain its control over the Settlement. With the rise of free-trade and an increase in the number of free-traders, the

Company was unable to effectively enforce rules, or to restrict and collect duty on goods. It was at this point, 1846, that the Sixth Regiment of Foot was brought from England. Alexander Christie stated the HBC reasoning in a letter to Chief Factor Donald Ross at Norway House:

If we succeed in getting a garrison established at RR, we shall be able to put down the illicit trade and keep the settlers in order, but nothing must be said about it until we are quite certain of it (Guinn, 1980: 72).

The Sixth Regiment was used to maintain law and order and to limit free trade. "In this capacity, the military was an appendage of the top levels of the Company hierarchy and stood in a social position immediately under the Company's Governor and above the settlement population" (Monks, 1983: 5). In fact the Colonel Ffolliott Crofton, Commanding Officer of the Sixth Regiment, acted as the Governor of Assiniboia (Ross, 1856: 364).

2.3 THE SIXTH REGIMENT OF FOOT

By-in-large, Upper Fort Garry was an isolated centre. It was fifteen hundred miles from the nearest city in the east, and six hundred miles from any other outlet to the rest of the world (MacLeod, 1949: 5).

The fort's remoteness became even more evident in the 1840s when problems began to arise. Trouble was brewing with the Metis over the rights to free trade and the threat of war with the United States over the Oregon boundary dispute was a reality.

As a solution to this problem, British troops were sent to the Red River Settlement. The Sixth Regiment of Foot was dispatched in 1846 and consisted of one field officer, three captains, three lieutenants, three ensigns, one assistant surgeon, fifteen non-commissioned officers, six drummers and 270 rank and file, with the usual proportion of Women and children (Morrison, 1970: 169).

Major John Ffolliott Crofton was selected to command the detachment. The trrops left from Cork on June 26, 1846 for the Hudson Bay. They arrived at York Factory on August 8, but did not arrive at Lower Fort Garry until the middle of September. Major Crofton preceded the troops to the lower fort and left just a couple of days afterwards to move onto Upper Fort Garry, where headquarters were to be established (Morrison, 1970: 170-171). The Force was divided in two. The smaller part of the force stayed at Lower Fort Garry, while the remaining officers and men moved on to Upper Fort Garry (Ingersoll, 1945: 15-16).

At the Upper Fort, a fence was installed down the middle, creating two separate areas. The east side of the fort being used by the Hudson's Bay Company; the west by the Sixth Regiment. "The warehouses along the west wall were turned into barracks, and the four stone bastions were used respectively as a guard room, an engineer's office and sotre, a sutler's shop and a magazine. The jail outside the walls, was turned into a hospital, and two buildings, 60 by 30 were put up to the north of the fort as additional barracks"(Ingersoll, 1945: 16).

The Sixth Regiment was well received by the Red River community. The addition of over 300 people expanded the local population, thereby

increasing the size of the local market significantly. This created a much needed outlet for the surplus of agricultural food produced by the farmers.

Chapter III

METHODOLOGY

3.1 ARCHAEOLOGICAL EXCAVATIONS

In 1978 and 1979, the City of Winnipeg and the Downtown Association sponsored two brief test excavations around the palisades and rear gateway of Upper Fort Garry. Parks Canada tested two areas of the gate: "the roadway through the gate and a section of the north palisade of the fort, east of the gate" (Priess, 1980: 2). Their primary objective was to discern structural information about the fort. Excavations revealed that the gate was constructed with only a partial foundation.

One footing was discovered under the southeast corner ... It appears reasonable to suggest that similar footings were installed for all four corners of the gate ... The gate had wooden gates hung on three strap hinges and on the ground below the wooden gates there was a wooden sill (Priess, 1980: 13).

Excavated evidence provided little information regarding the construction of the palisade. Detailed documentary accounts indicate that

the palisade was a rubble-filled cribbing of horizontal logs. Illustrations show a stone base for the palisade ... [which] was built on the ground. A stone below ground foundation for the palisade was present only adjacent to the gate wall (Priess, 1980: 13).

Artifacts recovered were assignable to a post-occupational period, dating from the late nineteenth century up to recent times.

The 1979 excavations, conducted by Michael Kelly, were designed to "identify and determine the full nature of the archaeological resources within the park's boundary" (Kelly, 1981).

A series of ten contiguous 2 by 3 m excavation units were laid out straddling the projected centerline of the palisade ...
Two more units (1x3m and 2x3m) were excavated in the former compound interior immediately south of the palisade line where the building listed as the general department on the HAZEL map of 1876 was located (Kelly, 1981).

No posts or post molds were identified; foundation remains belonging to the General Department building were uncovered in the units located within the compound interior (Kelly, 1981). Approximately four thousand artifacts were recovered. Based on a preliminary analysis, the majority appear to date from the late nineteenth century to the present - a post-occupational period.

In order to learn more about the fort, further excavations were conducted in the only other accessible area of the fort, namely the northeast corner of Bonnycastle Park (Figure 4). This park is located at the southwest corner of Main Street and Assiniboine Avenue. Unfortunately, the remainder of the fort lies under Main Street, Assiniboine Avenue, the Fort Garry Curling Rink, 100 Main Street, and a city parking lot.

Archaeological work at Bonnycastle Park began in 1981 and was continued during 1982 and 1983 (Figure 4). All work was done under the direction of Dr. Greg Monks. The crews employed were comprised primarily of graduate and undergraduate students from the Universities of Manitoba and Winnipeq.

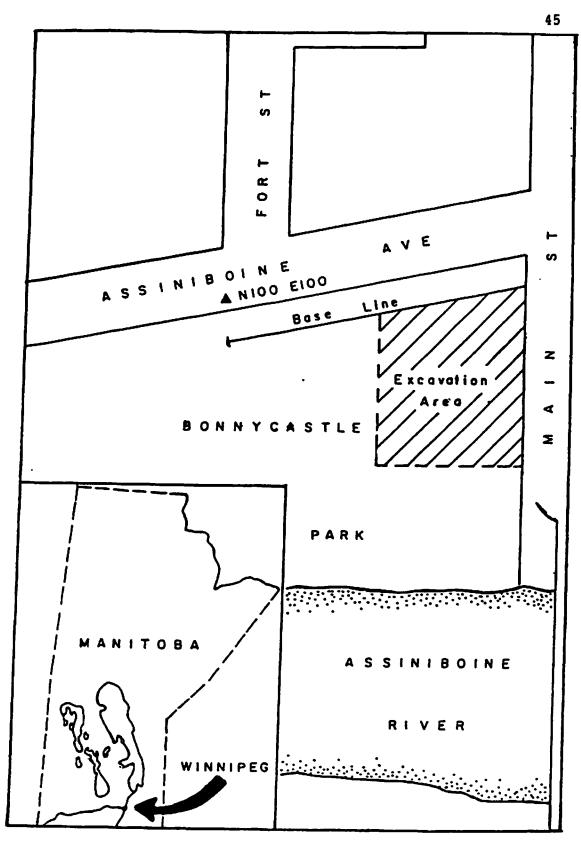


Figure 4: The Upper Fort Garry Site (DILg-21)

A three-dimensional grid reference system was used throughout the three-year period.

Horizontal measurements were taken from the City of Winnipeg's special survey pin on the south side of Assiniboine Avenue at the foot of Fort Street. This pin was assigned the location N100 m, E100 m, so that all measurements on the site were taken in terms of north and east coordinates. Vertical control ... [was] established in metres ASL according to the 232.203 m ASL elevation of the brass Geodesic Survey plug in the pumphouse foundation in the southeast corner of the park (Monks, 1983: 4).

Metre square units were surveyed in by transit and labelled by the coordinates of the northeast corner (Monks, 1982: 33). Units were shovel-shaved to remove the overburden (twentieth century fill). The cultural strata were trowelled. Soil samples were taken from each unit and were waterscreened in the field using a one-quarter inch mesh screen and a garden hose (Monks, 1982: 33). Artifacts recovered were individually measured in from the northeast corner of the units.

The excavations in Bonnycastle Park uncovered the foundation of the fort's west wall, the foundation of a large building inside the fort, and two privy/refuse pits (Figure 5). The west wall of the fort was exposed in the 1982 excavations and was expanded upon in 1983. It ran in a continuous alignment from the excavated units N95 m to N177 m (Monks, 1983: 34-35). The foundation of the wall "was composed of large cobbles and boulders, both limestone and granite, held together by mortar. The foundations measured 3' wide by 18" deep and were laid in a trench dug into the ground" (Loewen and Monks, 1988: 21).

The three walls of the building foundation uncovered

rested on a foundation of similar materials and width [to the fort wall] but, inexplicably, was twice as deep (i.e. 3'). Three wooden beams appear to be floor joists supported by

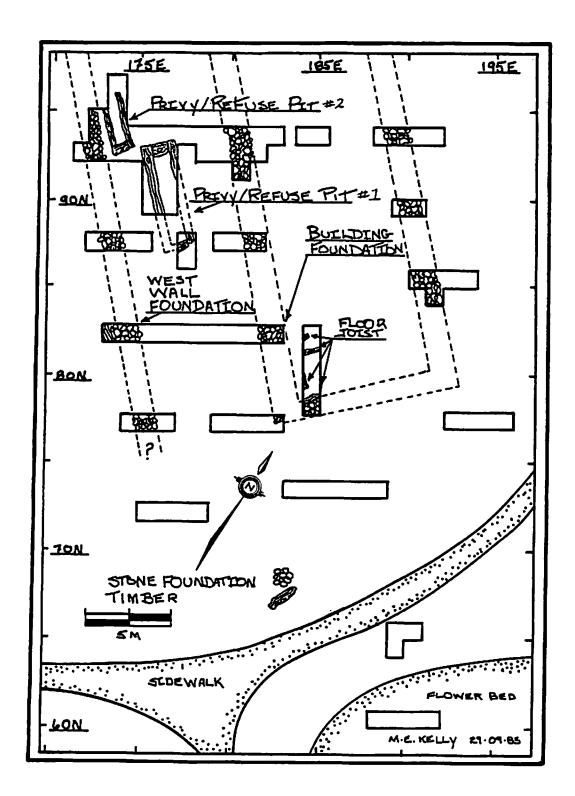


Figure 5: Plan View of Excavations Showing Location of Privies

rocks and mortar. There was a distance of c. 109.5 cm between each beam, an interval approximating the archaic measure known as the English or cloth ell (45 in.) (Monks, 1983: 37).

The two privy refuse pits were an exciting discovery. The larger pit measured approximately 10' x 6' x 5'3" (3m x 1.8m x 1.6m). It was cribbed with hand-hewn oak beams. The northeast corner

was made by chopping the end of each log to form a tenon ... An effort seems to have been made to fashion tenons that sloped down and out from the building. The purpose of this method of construction was to allow any water to run out of the corner of the building, thereby helping to keep the interior dry and the corner from decomposing rapidly (Monks, 1982: 53).

The second pit was narrower and shallower. It too was cribbed with oak beams to prevent dumpage, but these beams were sawn. Both structures yielded a brown organic matrix that is unquestionably manure. Chemical tests indicate that at least some of it is human, confirming the use of the structure as a privy. The large amounts of artifactual remains suggests a dual purpose of the structures as refuse pits as well (Monks, 1982: 23).

3.2 DATING

The privies were dated using a variety of materials: ceramics, glass, newspaper, and textiles. The results are thoroughly discussed by Gail Fifik (1986); a brief summary is presented here. In this discussion, the four artifact classes used in this analysis are considered separately using a variety of methods. Following this analysis, the results are compared with each other and assessed as to reliability. The privies were also dated separately for comparative purposes, but the dates for both range from as early as the 1820s to as late as the 1900s.

Ceramics were dated according to the production dates of the patterns. These dates were arrived at using South's mean ceramic date method (1978, 1979). Based on the ceramic patterns an initial date of 1839.8 and a terminal date of 1874.8 were suggested for Privy 1. The dates suggested from Privy 2 were 1832.4 (initial) and 1866.1 (terminal). However, problems exist with this technique. The minimum number of vessels represented by the fragments was not calculated and vessel types were not distinguished. This could skew the results by affecting the weighting factor. Also, no dates were identified for one pattern 'crenulated' found exclusively in Privy 2 and making up nineteen percent of that sample.

Although neither privy was totally excavated, a difference in frequency of ceramic artifacts recovered was noted, suggesting that there were depositional differences. It is hypothesized on the basis of this frequency that Privy 2 was used by the lower ranks of the army (privates) while Privy 1 was used by the higher ranks (officers, sergeants, and corporals with families). Metal plates and cups were probably used by the military personnel of the Sixth Regiment of Foot (1846-1848) (Sussman, 1979b: 191). Commissioned officers used ceramic dishes (Sussman, 1979b: 191). "At Upper Fort Garry, it would be expected that the officers, and sergeants and corporals with families also had their own ceramic dinner services" (Fifik, 1986: 70).

It was not possible to correlate the dates of ceramic patterns with above sea level (ASL) depths and stratum due to depositional factors which have resulted in the stratigraphic mixing of artifacts. This

could have been caused by both natural and human depositional factors, such as artifact use, reuse, and discard; cleaning of the privy; dumpage of material; frost heaving; and rodent activity (Fifik, 1986: 82).

The manufacturer's marks on the ceramics were also used in dating the privies. Dates ranged from 1833 to 1867. The correlation of the dates of ceramic manufacturer's marks with ASL and stratum was more successful in that the earliest manufacturer's mark was found at the lowest ASL for Privy 1.

Glass artifacts were dated according to their mode of manufacture and gave dates ranging from 1820 up to the twentieth century (Fifik, 1982: 92). Glass was also mixed by ASL and by strata in each privy.

Newspapers provided the tightest and most consistent dating. A variety of newspapers was recovered from Privy 1. Included were the Times (of London), the Montreal Gazette, the New York Times, and a paper from the Isle of Man. All of them dated to 1846 and 1847. The newspaper remains from Privy 2 were in poor condition. Only one fragment from a newspaper or leaflet was found bearing a date, 1880. This evidence supports the hypothesis that Privy 1 was in use when the Sixth Regiment of Foot was garrisoned at Upper Fort Garry from 1846 to 1848, but would suggest that Privy 2 was used later.

The textile evidence for dating is scanty. Based on the patterns and the scarcity of machine stitching, most appear to have been made during the first half of the nineteenth century.

The fibre and vermicelli pattern of one fragment (DILg-21/6006) may be a copy in fabric of both ceramic patterns. The vermicelli ceramic pattern itself is dated from

1828-58 (Sussman, 1979: 93). The fancy silk monochrome pattern (DILg-21/5515) is reminiscent of patterns from the French and English silk mills circa 1800-50 (Fifik, 1986: 90).

Two fragments were found in Privy 1 which were definitely associated with the Sixth Regiment of Foot (1846-1848). Two cotton fragments, possibly shirts, have names stamped on them: "W. Stokes" and "C. Fidds." Both are listed on the payroll sheets as privates (WO12/2415-2417) (Fifik, 1986: 90).

The historical evidence can be used to refine the dates suggested by the artifacts. The fort was constructed in 1836 and was demolished in 1882. Thus, artifacts which might predate the construction of the fort are probably a reflection of reuse and curation (Fifik, 1986: 92).

The four artifact classes yielded varying dates for the two privy/refuse deposits. The artifactual evidence, namely the newspapers, appears to support the hypothesis that Privy 1 was in use during the late 1840s, possibly when the Sixth Regiment of Foot was in residence at the Fort. It is harder to pinpoint the date of Privy 2's existence. Following Fifik's analysis, it appears to post-date Privy 1 and the Sixth Regiment's occupation of the Fort. However, in a ceramic analysis by Larcombe (1988), the opposite was suggested (i.e. Privy 2 predates the arrival of the military). Because Fifik's analysis is on a broader scale, encompassing more artifact classes of data, her results are being used in this thesis. Hence it is hypothesized that Privy 1 was in use during the occupation of the Fort by the Sixth Regiment of Foot and that Privy 2 is post-military.

Special note should be made of references in the historic literature which indicate that privies were periodically cleaned out. For example, at Fort Wellington "it appears that the pits were regularly cleaned out ... In between, the latrines were regularly treated with lime to help reduce the odor" (Carter-Edwards, 1986: 8).

The latter process was practiced at Upper Fort Garry. During the excavation of the structures, lenses of ash and lime were encountered several times. The archival documents relating to the fort refer to a number of privy structures having been built along the west wall of the fort (Loewen and Monks, 1986: 40). This suggests perhaps that when faced with the dilemma of emptying them or covering them over and moving the latrines elsewhere, the latter option was selected. Thus the artifacts and the bones recovered from the privies probably reflect a relatively short-term deposit.

3.3 ARCHAEOLOGICAL DATA AND ORGANIZATION

The faunal material discussed in the following thesis was recovered during the 1982 field season from the two privy/refuse deposits at Upper Fort Garry. Bones from the 1981 collection were recovered primarily from post-occupational fill layers and were thus of little significance to this study. The 1982 collection provided a sample of over four thousand bones, approximating seventy-five percent of the total number of bones recovered from all excavations conducted (1981-1983).

Statistically, this represented a more than adequate sample for analytical purposes. Random sampling was not necessary because the sample size was greater than fifty percent.

The bones were identified using the faunal collections at the Universities of Manitoba and Toronto, as well as the Manitoba Museum of Man and Nature and the Royal Ontario Museum. All bones were identified to the smallest taxonomic unit possible. This information was coded according to the Parks Canada manual (1982) and stored on a computer file (Appendix A). The variables examined for each bone were locational information including site, unit, level, stratum, ASL, north provenience and east provenience; animal class; taxon; anatomical element; portion of element; segment of portion; weight; side; fusion; eruption; burn; juvenile cortex; break; butchering type; and flake.

A separate file card system was kept for those bones which had been butchered. Variables noted were bone segment, type of butchering marks, and exact location of the butchering marks on the bone.

All of the above variables allow the sample to be analyzed quantitatively to identify species used as food sources. It is also possible to identify parts preferred and to equate these with types of butchered meat cuts (short ribs, rump roast, blade steak, for example). Relative meat costs were obtainable through the archival sources and historic documents. Using these prices in conjunction with the faunal data the economic value of the sample is assessable.

3.4 NATURE OF THE PRIVY DEPOSITS

Before starting the analysis of the faunal remains from the two privies, it must be explained that several assumptions have been made. Firstly, it is assumed that different groups had different privies. At Fort Wellington, studies of the latrines built in 1838/1839 indicate that the structure had "three separate compartments, each with their own entrance: the men's privy, the women's privy, and the officers' privy" (Carter-Edwards, 1986: 1). These compartments varied reflecting the social life within the British army in the mid-1800s. The men's privy was characterized by an obvious lack of privacy. Their latrine consisted of a bench along a wall "with a series of wooden rungs on which they perched rather than sat on a flat wooden surface with a hole cut out" (Carter-Edwards, 1986: 3). The women's latrine was divided by partitions from the men's and officers' latrines. The interior had been white-washed. The women had a flat, finished seat, with probably two holes cut out allowing semi-private accommodations (Carter-Edwards, 1986: 5).

The officers' latrine was similar to the women's latrine except that there was only one hole in the flat, finished seat, providing complete privacy. The interior was white-washed and "ventilation was provided to each cubicle by means of a window-situated on a sliding track which enabled it to be opened or closed" (Carter-Edwards, 1986: 6).

A similar arrangement was found to exist at the Dauphine Latrines in Artillery Park, Quebec City. Although the latrines were built with the same exterior design and of the same construction materials, the

interior layout differed depending upon for whom they were constructed (Deslauriers, 1984: 6-7).

For privates and their wives, no effort was made to indicate the position of the seats, between which there was certainly no partition. The non-commissioned officers seem to have been more at ease in smaller, partitioned buildings, providing them with greater privacy (Deslauriers, 1984: 6-7).

It would appear plausible to assume that at Upper Fort Garry different groups had different privies. For example, the military and the HBC probably had their own mutually exclusive privies, and within these groups and privies, there were further subdivisions based on position and status.

Secondly, based on the dating of artifacts recovered from the privies it is hypothesized that Privy 1 predates Privy 2.

Thirdly, because of the presence of military related artifacts (buttons, material with soldier's name, and the presence of newspapers dating to the late 1840s, for example), it is believed that Privy 1 was used by the military personnel. Privy 2 dates to a later time period, one which is post-military. Thus it may have been used by either the military or by other residents of the fort (HBC employees).

Fourthly, knowing the importance of the fort, the military, and the fort's inhabitants, it is assumed that the artifacts comprising the privy deposits reflect an upper class diet.

Chapter IV

FAUNAL ANALYSIS

4.1 INTRODUCTION

In total, 4842 specimens have been catalogued and analyzed. On the whole the bones reflect good preservation. The sample consisted of 1955 mammalian, 494 avian, 1677 osteichthyes, 132 molluscan and 584 unanalyzable elements (Table 3). Approximately twenty percent (20.83%) of the sample was identified to order or a smaller taxon (Table 4). Fish scales numbered 1042 and ranged from poor to good condition. The scales were not included in the analysis because of limited access to a complete comparative collection. It was also assumed that the large sample of fish bones would be representative of the fish species utilized as food resources.

Faunal material was recovered from forty units during the 1982 excavations. The majority of the faunal remains were located within the two privy/refuse pits. Privy 1 yielded 46.37% of the total sample from six units: N90 E177, N91 E176, N91 E177, N92 E177, N94 E176, and N93 E177. Privy 2, on the other hand, yielded 25.90% of the total assemblage from five units: N93 E174, N94 E174, N94 E175, N96 E174, and N97 E174.

TABLE 3
Faunal Findings by Zoological Class

Class	Total Faunal Sample	Percentage of Total Faunal Sample
Mollusca	132	2.73 %
Osteichthyes	1677	34.63
Reptilia	0	0.00
Amphibia	Ö	0.00
Aves	494	10.20
Mammal	1955	40.38
Class uncertain	584	12.06
Total	4842	100.00

TABLE 4
Elements Identified to Order or Smaller Taxon

Class	No. Excavated Faunal Elements	No. Excavated Elements Identified	% Total Faunal Sample Identified
Mollusca	132	4 214	.08 % 4.42
Osteichthyes Amphibia	1677 0	0	0.00
Reptilia Aves	0 494	0 281	0.00 5.80
Mammalia	1955	510 0	10.53 0.00
Class Uncerta	in 504	U	0.00
Total	4842	1009	20.83%

The remaining 27.73% of the total faunal assemblage was recovered from units outside of the two structures. Of these, 95.5% was found within the fill layers (Stratas 1-3). The 58 bones which were found below the fill were contained within the Paleosol strata. These bones may simply represent general discard at the fort or may be indicative of earlier native occupations. No domesticates were represented by these bones and there was no indication of human alteration (charring or butchering, for example).

The two privy/refuse pits were studied individually, as separate deposits. Newspapers dated to 1845 and 1846, plus the recovery of an 1846 coin, suggest that Privy 1 dates to the late 1840s. This is the time period in which the Sixth Regiment of Foot was stationed at Upper Fort Garry. Artifacts from Privy 1 such as pieces of cloth and a brass medallion with Sixth Regiment markings suggest that this privy was used by the military and that the deposits relate directly to the occupation of the fort by the Sixth Regiment (Monks, 1981: 26).

Artifacts from Privy 2 date to a later time period, one which is possibly post-military. Thus it may have been used by either the military or by other residents of the Fort (HBC employees, for instance).

4.2 PRIVY 1

The sample consisted of 775 mammalian, 324 avian, 748 osteichthyes, 13 molluscan and 185 unanalyzable elements.

A high moisture content in the soil, beginning at or near the top of the first log structure (231.50 m ASL) provided an anaerobic environment in which normally perishable organic remains were preserved (Monks, 1983: 25).

Because of this excellent preservation, differential bone deterioration should not be a factor.

4.2.1 <u>Mammalian</u> <u>Elements</u>

Mammalian remains dominate, comprising 43.12% of the Privy 1 fauna. Of the 975 elements, 420 (43.02%) were identifiable to a zoological taxon below class (Table 5). Unidentifiable mammal bones were sorted according to size, where possible. Bones from animals smaller than white-tailed jack rabbit were classed as small mammals; bones from animals larger than a rabbit but smaller than a wolf were classified as medium mammals; and bones from animals larger than a gray wolf were classified as large mammals.

In total, there were twelve taxa represented, belonging primarily to two orders, Artiodactyl and Lagomorpha. Within the Artiodactyl order the Cervid family is minimally represented. Elements belonging to the Bovid family comprise 24.21% of the sample. Thirty sheep bones were positively identified. The term 'sheep-goat' was used when a positive identification could not be made.

TABLE 5

Mammalian Element Identification, Privy 1

Species	No. of elements (422) identif. to zoolog. taxa below class	% total Mamm. elem. identif. to zoolog. taxa below class	% total (975) excavated Mammal elements
Homo sapiens Linnaeus	1	.2	-1
(Man)		a	
Leporidae sp.	14	3.3	1.4
Lepus sp.	8	1.9	.8
Lepus americanus Erxleben (Snowshoe Hare)	43	10.2	4.4
Canis sp.	1	.2	- 1
Vulpes vulpes (Linnaeus) (Red Fox)	69	16.4	7.1
Artiodactyl sp.	8	1.9	-8
Cervidae sp.	1	.2	.1
Bovidae sp.	153	36.3	15.7
Bison bison (Linnaeus) (Bison)	6	1.4	.6
Bos tauros (Domestic Cow)	29	6.9	3.0
Capra/Ovis sp. (Gost/Sheep)	2	.5	.2
Capra hirca (Domestic Goat)	16	3.8	1.6
Ovis aries (Domestic Sheep)	30	7-1	3.1
Sus scrofa (Domestic Pig)	39	9.2	4.0
Antilocapra americana (Ord) (Pronghorn)	1	.2	.1
Equus caballus (Domestic Horse)	1	.2	.1
SUBTOTAL	422	99.9	43.2
Large mammal sp.	271		27.8
Medium/Large mammal sp.	104		10.7
Medium mammal sp.	69		7.1
Small/Medium mammal sp.	23		2.4
Small mammal sp.	4		.4
Mammal sp.	82		8.4
TOTAL	975		100.0

Nearly five times as many cow elements were identified as opposed to bison bones. Olsen (1977) was used to distinguish between the two species; where doubt existed the bone in question was assigned to the Bovid taxa. Other than cow, the only domesticates included in the sample were pig and horse. Pig made up four percent of the sample, horse was represented by a single bone.

Four wild species in addition to bison were identified in the sample. Pronghorn and Cervid (elk/moose) were only minimally represented, 69 red fox bones were recovered, but they are primarily skull bones from one individual, and the Leporidae family comprised 6.67% of the mammalian elements.

4.2.2 <u>Avian Elements</u>

Avian elements comprise 14.3% of the Privy 1 sample, 25% being assignable to one of 15 taxa (Table 6). Water birds (herons, geese and ducks) account for 20.04% of the elements. While the faunal sample was highly identifiable, insufficient comparative faunal collections prohibited identification beyond family in most cases.

The highest percentage of the avian collection belongs to the Tetraonidae family. Chicken elements were the most numerous, followed by Sharp-tailed grouse. Where uncertainty existed, the element was classed as Tetraonidae sp.

The presence of three avian species included in this sample is of interest. Ten percent of the avian collection belongs to the Corvidae

TABLE 6
Avian Element Identification, Privy 1

Corvus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) 248 99.9 SUBTOTAL 248 99.9 Large bird sp. 1 .3 Medium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	Species	No. of elements (248) identif. to zoolog. taxa below class	Z total Avian elem. identif. to zoolog. taxa below class	% total (324) excavated Avian elements
Anatidae sp. 20 8.1 6.2 Olor columbianus (Ord) 1 .4 .3 (Whisting Swan) Anserinae sp. 4 1.6 1.2 Eranta canadensis (Linnaeus) 5 2.0 1.5 (Ganada Goose) Chen caervlescens (Linnaeus) 5 2.0 1.5 (Snow Goose) Anatinae sp. 5 2.0 1.5 (Anas sp. 1 .4 .3 Anas platyrhynchos Linnaeus 13 5.2 4.0 (Mellard) Mareca americana (Gmelin) 1 .4 .3 (American Widgeon) Alx sponsa (Linnaeus) 5 2.0 1.5 (Wood Duck) Galliformes sp. 3 1.2 .9 Tetraonidae sp. 23 9.3 7.1 Pedioectes phasianellus 10 4.0 3.1 (Linnaeus) (Sharp-tailed Grouse) Gallus gallus domesticus 82 33.1 25.3 (Domestic Chicken) Meleagris sp. 2 .8 .6 Grus americana (Linnaeus) 1 .4 .3 (Mood Dung Grane) Scolopacidae sp. 10 4.0 3.1 (Ectopistes migratorius 10 4.0 4.0 3.1 (1		.3
Olor columbianus (Ord)	•	4	1.6	1.2
Miscling Swan Anserinae sp. 4		20	8.1	6.2
Branta canadensis (Linnaeus) 5 2.0 1.5		1	.4	.3
Chen caervlescens (Linnaeus) 5 2.0 1.5		4	1.6	1.2
Snow Goose Anatinae sp. 5		5	2.0	1.5
Anatinae sp. 5 2.0 1.5 Anas platyrhynchos Linnaeus 13 5.2 4.0 (Mallard) Marca americana (Gmelin) 1 .4 .3 (American Widgeon) Aix sponsa (Linnaeus) 5 2.0 1.5 (Wood Duck) Galliformes sp. 3 1.2 .9 Tetraonidae sp. 23 9.3 7.1 Pedioecctes phasianellus 10 4.0 3.1 (Linnaeus) (Sharp-tailed Grouse) Gallus gallus domesticus 82 33.1 25.3 (Domestic Chicken) Meleagris sp. 2 88 .6 Grus sp. 2 88 .6 Grus sp. 2 88 .6 Grus americana (Linnaeus) 1 .4 .3 Grus sp. 2 8 .6 Grus americana (Linnaeus) 1 .4 .3 (Whooping Crane) Scolopacidae sp. 10 4.0 3.1 Ectopistes migratorius 10 4.0 3.1 (Linnaeus) (Passenger Pigeon) Passeriformes ap. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus brachyrhynchos Brehm 17 3.4 Medium/Large bird sp. 1 3.4 Medium/Large bird sp. 1 3.4 Medium/Large bird sp. 1 3.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 3.3 Bird sp. 1 3.4 Bird sp. 1 3.4	Chen caervlescens (Linnaeus)	5	2.0	1.5
Anas sp. 1		5	2.0	1.5
Anas platyrhynchos Linnaeus (Hallard)	•	-	-	
Marcia americana (Gmelin) 1	Anas platyrhynchos Linnaeus	13		
Aix sponsa (Linnaeus) (Mood Duck) Galliformes sp. 3 1.2 .9 Tetraonidae sp. 23 9.3 7.1 Pedioecctes phasianellus 10 4.0 3.1 (Linnaeus) (Sharp-tailed Grouse) Gallus gallus domesticus 82 33.1 25.3 (Domestic Chicken) Meleagris sp. 1 .4 .3 Grus sp. 2 .8 .6 Grus americana (Linnaeus) 1 .4 .3 (Whooping Grane) Scolopacidae sp. 10 4.0 3.1 Ectopistes migratorius 10 4.0 3.1 (Linnaeus) (Passenger Pigeon) Passeriformes sp. 8 3.2 2.5 Corvudae sp. 16 6.5 4.9 Corvus sp. 1 .4 .3 Gorus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) SUBTOTAL 248 99.9 Large bird sp. 1 3.4 Medium/Large bird sp. 1 1 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 3.3	Mareca americana (Gmelin)	1	.4	.3
Galliformes sp. 3 1.2 .9 Tetraonidae sp. 23 9.3 7.1 Pedioecctes phasianellus 10 4.0 3.1 (Linnaeus) (Sharp-tailed Grouse) Gallus gallus domesticus 82 33.1 25.3 (Domestic Chicken) Meleagris sp. 1 .4 .3 Grus sp. 2 .8 .6 Grus americana (Linnaeus) 1 .4 .3 (Whooping Crane) Scolopacidae sp. 10 4.0 3.1 Ectopistes migratorius 10 4.0 3.1 (Linnaeus) (Passenger Pigeon) Passeriformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus sp. 1 .4 .3 Corvus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) SUBTOTAL 248 99.9 Large bird sp. 1 3.4 Medium/Large bird sp. 11 3.4 Medium/Large bird sp. 12 3.4 Medium bird sp. 7 2.2 Small/Medium bird sp. 7 2.2 Small/Medium bird sp. 1 3.3	Aix sponsa (Linnaeus)	5	2.0	1.5
Tetraonidae sp. 23 9.3 7.1 Pedioecctes phasianellus 10 4.0 3.1 (Linnaeus) (Sharp-tailed Grouse) Gallus gallus domesticus 82 33.1 25.3 (Domestic Chicken) Meleagris sp. 1 .4 .3 Grus sp. 2 .8 .6 Grus americana (Linnaeus) 1 .4 .3 (Whooping Crane) Scolopacidae sp. 10 4.0 3.1 Ectopistes migratorius 10 4.0 3.1 (Linnaeus) (Passenger Pigeon) Passeriformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus prachyrhynchos Brehm 16 6.5 4.9 (American Crow) SUBTOTAL Large bird sp. 1		3	1.2	.9
Pedioecctes phasianellus				
Callus gallus domesticus Record Chicken Releagris sp. 1	Pedioecctes phasianellus (Linnaeus)	_		
Meleagris sp. 1 .4 .3 Grus sp. 2 .8 .6 Grus americana (Linnaeus) 1 .4 .3 (Whooping Crane) .6 .4 .0 3.1 Ectopistes migratorius 10 4.0 3.1 (Linnaeus) (Passenger Pigeon) Passenformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus sp. 1 .4 .3 Corvus brachyrhynchos Brehm (6.5 4.9 (American Crow) SUBTOTAL (248 (248 (248 (248 (248 (248 (248 (248	Gallus gallus domesticus	82	33-1	25.3
Grus sp. 2 .8 .6 Grus americana (Linnaeus) 1 .4 .3 (Whooping Crane) .6 .6 .3 Scolopacidae sp. 10 4.0 3.1 Ectopistes migratorius 10 4.0 3.1 (Linnaeus) (Passenger Pigeon) Passeriformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus sp. 1 Corvus brachyrhynchos Brehm 16 6.5 4.9 Corvus brachyrhynchos Brehm 16 6.5 4.9 SUBTOTAL 248 99.9 Large bird sp. 1 3.4 Medium/Large bird sp. 1 3.4 Medium bird sp. 43 3.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 3 Bird sp. 13 4.0	Meleagris sp.	1	.4	.3
Crus americana (Linnaeus) 1				_
Ectopistes migratorius 10 4.0 3.1 (Linnaeus) (Passenger Pigeon) 2.5 Passeriformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus pp. 1 .4 .3 Corvus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) 248 99.9 SUBTOTAL 248 99.9 Large bird sp. 1 3.4 Medium/Large bird sp. 1 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0		1	.4	.3
(Linnaeus) (Passenger Pigeon) Passeriformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus sp. 1 .4 .3 Corvus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) SUBTOTAL 248 99.9 Large bird sp. 1 .3 Hedium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	Scolopacidae sp.	10	4.0	3.1
(Linnaeus) (Passenger Pigeon) Passeriformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus sp. 1 .4 .3 Corvus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) SUBTOTAL 248 99.9 Large bird sp. 1 .3 Hedium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	Ectopistes migratorius	10	4.0	3.1
Passeriformes sp. 8 3.2 2.5 Corvidae sp. 16 6.5 4.9 Corvus sp. 1 .4 .3 Corvus brachyrhynchos Brehm 16 6.5 4.9 SUBTOTAL 248 99.9 Large bird sp. 1 .3 Medium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	(Linnaeus)			
Corvidae sp. 16 6.5 4.9 Corvus sp. 1 .4 .3 Corvus brachyrhynchos Brehm (American Crow) 16 6.5 4.9 SUBTOTAL (American Crow) 248 99.9 99.9 99.9 99.9 10		8	3.2	2.5
Corvus sp. 1 .4 .3 Corvus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) 248 99.9 SUBTOTAL 248 99.9 Large bird sp. 1 .3 Medium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0		-		
Corvus brachyrhynchos Brehm 16 6.5 4.9 (American Crow) 248 99.9 SUBTOTAL 248 99.9 Large bird sp. 1 3.4 Medium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	Corvus sp.	= 1		
SUBTOTAL 248 99.9 Large bird sp. 1 .3 Medium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	Corvus brachyrhynchos Brehm (American Crow)	16	6.5	
Large bird sp. 1 .3 Medium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	SUBTOTAL	248	99.9	
Medium/Large bird sp. 11 3.4 Medium bird sp. 43 13.3 Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0	Large bird sp.			.3
Small/Medium bird sp. 7 2.2 Small bird sp. 1 .3 Bird sp. 13 4.0				
Small bird sp. 1 .3 Bird sp. 13 4.0		_		
Bird sp. 13 4.0				-
	•	_		
	Bird sp. TOTAL	324		4.U 99.7

family (crows/raven). Were these birds eaten as food items? Or were the occupants of the fort simply removing a nuisance by killing them? The inclusion of very small birds (Passiforms) must also be questioned. Of special note are the ten passenger pigeon bones. This species is now extinct.

4.2.3 Osteichthyes

One third of the Privy 1 faunal assemblage is made up of fish elements (Table 7). Thirteen taxa are represented, all of which are locally available, and all are generally considered highly edible. The most numerous species are walleye, sucker, goldeye, and whitefish. Three quarters of the fish elements were unidentifiable. This was due to the type of elements recovered (spines and rays) and insufficient comparative faunal collections.

TABLE 7
Osteichthyes Element Identification, Privy 1

Species	No. of elements (184) identif. to Zoolog. taxa below class	% total Fish elem. identif. to zoolog. taxa below class	% total (748) excavated Fish elements
Coregonus sp.	10	5.4	1.3
Coregonus artedii Lesueur (Lake Herring)	2	1.1	.3
Coregonus clupeaformis (Mitchell) (Lake Whitefish)	21	11.4	2.8
Hiodon alosoides (Kafinesque) (Goldeye)	24	13.0	3.2
Cyprinus carpio Linnaeus (Carp)	4	2.2	.5
Catostomus sp.	4	2.2	.5
Catostomus catostomus (Forster)	16	8.7	2.1
(Longnose Sucker)	•		
Catostomus commersoni (Lacepede)	22	12.0	2.9
(Whitenose sucker) Ictaluridae sp.	•	•	
Ictalurus sp. Ictalurus sp.	1	.5 .5	.1
Ictalurus punctatus	i	5	-1
(Rafinesque)	•	•••	• •
(Channel Catfish)	•	_	_
Percopsis omiscomayous (Walbaum)	1	.5	.1
(Trout-perch)			
Perciformes sp.	1	.5	.1
Percidae sp.	3	1.6	.4
Perca flavescens (Mitchell) (Yellow Perch)	1	.5	.4
Stizostedion sp.	1	.5	.1
Stizostedion vitreum (Mitchell) (Walleye)	70	38.0	9.4
Aplodinotus grunniens	1	.5	,
Rafinesque	•	•3	-1
(Freshwater Drum			
SUBTOTAL	184	99.6	24.2
Fish sp.	564		75.4
TOTAL	748		99.6

4.3 PRIVY 2

The number of faunal remains recovered from Privy 2 is substantially smaller than from Privy 1. The diversity of species is also not as great.

4.3.1 <u>Mammalian Elements</u>

Mammal remains comprise 25.54% of the sample. Only 15.77% was identifiable to a zoological taxa below class. However, the same trends as were seen in Privy 1 prevail. Domesticates dominate the sample with Bovidae elements being the most numerous. Only two bison elements and fourteen snowshoe hare elements were identified. These two are the only "wild" species included in the sample.

TABLE 8

Mammalian Element Identification, Privy 2

Species	No. of elements (50) identif. to zoolog. taxa below class	Z total Mamm. elem. identif. to zoolog. taxa below class	% total (317) excavated mammal elements
Homo sapiens Linnaeus (Man)	2	4.0	.6
Leporidae sp. Lepus americanus Erxleben (Snowshoe hare)	1 14	2.U 28.0	.3 4.4
Artiodactyl sp. Bovidae sp. <u>Bison bison</u> (Linnaeus)	3 13 2	6.0 26.0	.9 4.1
(Bison) Bos taurus (Domestic cow)	5	10.0	.6 1.6
Ovis aries (Domestic sheep) Sus scrofa	3	6.0	.9
(Domestic pig) SUBTOTAL	. 7	14.00	2.2
Large mammal sp.	50	100.00	15.6
Medium/Large mammal sp.	78		24.6
Medium mammal sp.	24		7.6
Small/Medium mammal sp.	5		1.6
Mammal sp.	5		1.6
TOTAL	155	_	48.9
	317		99.9

4.3.2 Avian Elements

Only sixty-four avian elements were recovered from Privy 2; of these only eighteen were identifiable to a zoological taxa below class. Once again, waterfowl and chicken/grouse elements were the most numerous.

TABLE 9
Avian Element Identification, Privy 2

Species	No. of elements (18) identif. to zoolog. taxa below class	% total Avian elem. identif. to zoolog. taxa below class	% total (64) excavated Avian elements
Anas sp.	4	22.2	6.3
Anas platyrhynchos Linnaeus (Mallard)	6	33.8	9.4
Tetraonidae sp.	1	5.5	1.6
(Domestic chicken)	5	27.7	7.8
Grus sp.	1	5.5	1.6
Coccyzus sp.	ī	5.5	1.6
SUBTOTAL	18	100.2	28.3
Large bird sp.	27		42.2
Medium/Large bird sp.	5		7.8
Medium bird sp.	4		6.3
Bird sp.	10		15.6
TOTAL	64		100.2

4.3.3 Osteichthyes Elements

Fish elements dominate the sample. However, of the 774 elements recovered, only 54 were identifiable to one of seven taxa. The most numerous were <u>Coregonus</u> sp., <u>Ictalurus</u> sp., and <u>Hiodon</u> sp. All were available locally.

TABLE 10
Osteichthyes Element Identification, Privy 2

Species	No. ot elements (65) identif. to zoolog. taxa below class	% total Fish elem. identif. to zoolog. taxa below class	% total (800) excavated Fish elements
Coregonidae sp.	18	27.7	2.3
Coregonus artedii (Lesueur) (Lake Herring)	6	9.2	.8
Coregonus clupeaformis (Mitchell)	9	13.8	1.1
(Lake Whitefish)			
Hiodon sp.	1	1.5	.1
<u>Hiodon alosoides</u> (Rafinesque) (Goldeye)	8	12.3	1.0
Catostomidae sp.	1	1.5	.1
<u>Ictalurus</u> sp.	1	1.5	.1
<u>Ictalurus nebulosus</u> (Lesueur) (Brown Bullhead)	10	15.4	1.3
Perca flavescens (Mitchell) (Yellow Perch)	4	6.2	.5
Stizostedion vitreum (Mitchell) (Walleye)	7	10.2	.9
SUBTOTAL	65	99.9	9.1
Fish sp.	735	••••	91.9
TOTAL	800		100.0

4.4 BUTCHERING

Ten percent of the total sample (Privies 1 and 2) show signs of butchering. Those bones which showed intentional cutting with a saw, cleaver, or large knife to make a certain shape or cut were classified as "butchered."

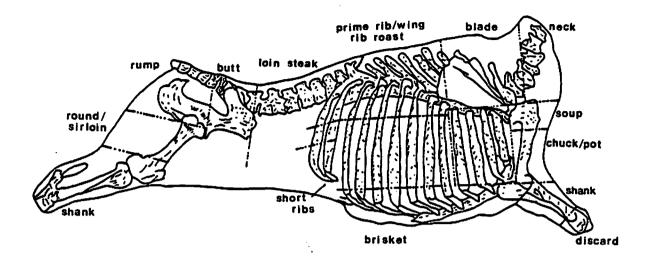
These bones were assigned to a particular "cut" on the basis of the Parks Canada Butchering Units (1982). This classification system represents a combination of standardized Anglo-Canadian-American carcass divisions. It identifies the bones or portions of bones that would be represented by each butchering unit. It does not deal with the tools or

the methods used to achieve these cuts. Therefore, it is easy to apply this system to comparative faunal samples because only three basic pieces of information are required for each bone, namely the element represented, the presence or absence of butchering marks, and a taxonomic identification.

The system is structured the same way for cow (beef), pig (pork), and sheep (lamb).¹ Carcass divisions are grouped into hind cuts, front cuts, and general cuts, and then subdivided into basic butchering units (shank, brisket, butt, etc.). The terminology is consistent throughout, thereby facilitating comparisons. The classification of cow butchering units has been designed to accommodate the larger Artiodactyl species such as Bison, Alces or Rangifer. Thus this system can accommodate bones which are identifiable only to the taxonomic level of order and allows comparison of wild versus domestic animal utilization.

Figures 6, 7, and 8 illustrate and define the butchering cuts of beef, pork, and lamb. The major sectioning of the bones comes at the lines indicating major carcass divisions.

[&]quot;Lamb" is used in preference to "mutton" to be consistent with modern meat terminology.



1. Hind Cuts

- a) shank all tarsals, tibia, fibula, distal articulating femur
- b) round/sirloin femur shaft
- c) rump proximal articulating femur, posterior pelvis
- d) butt anterior pelvis (acetabulum forward)
- e) loin steak lumbar vertebrae

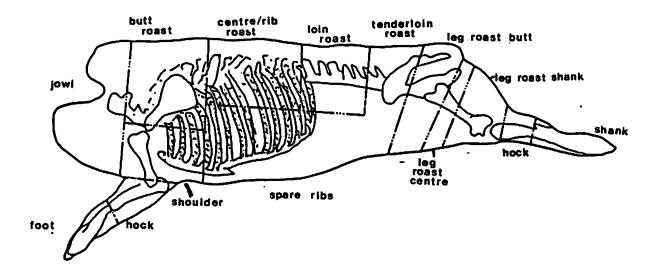
2. Front Cuts

- a) shank all carpals, radius, ulna, distal articulating humerus
- b) chuck/pot roast humerus shaft
- c) soup bones proximal articulating humerus, glenoid fossa
- d) blade steak/roast scapula (less glenoid fossa)
- e) neck cervical vertebrae
- f) rib roast thoracic vertebrae

General Cuts

- a) prime rib/wing proximal section all ribs
- b) short ribs medial section all ribs
- c) brisket distal section all ribs, sternum

Figure 6: Beef: Major Butchering Cuts and Carcass Divisions (Parks Canada Artifact Analysis Manual for Historical Archaeology, 1982)



I. Hind Cuts

- a) shank all tarsals, distal articulating tibia
- b) hock tibia shaft, fibula
- c) leg roast, shank proximal articulating tibia, distal half femur
- d) leg roast, centre femur shaft
- e) leg roast, butt proximal articulating femur, pelvis less ilium
- f) tenderloin roast ilium, sacrum
- g) loin roast lumbar vertebrae

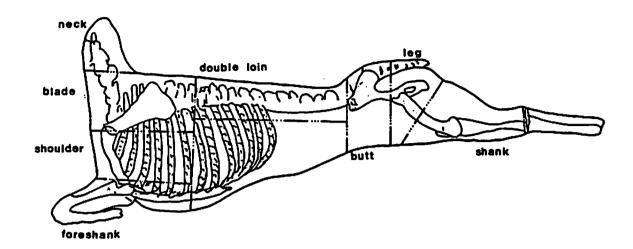
2. Front Cuts

- a) centre/rib roast thoracic vertebrae (proximal rib section)
- b) butt roast scapula
- c) jowl cervical vertebrae
- d) shoulder humerus less distal articulation (see General cuts)
- e) hock radius, ulna, distal articulating humerus
- f) foot all carpals, phalanges

3. General Cuts

- a) spare ribs all of rib but proximal section (distal plus medial section)
- b) whole shoulder roast whole rib

Figure 7: Pork: Major Butchering Cuts and Carcass Divisions (Parks Canada Artifact Analysis Manual for Historical Archaeology, 1982)



1. Hind Cuts

- a) shank all tarsals, distal articulating tibia and fibula
- b) leg of lamb rest of tibia and fibula, femur, posterior pelvis
- c) butt anterior pelvis
- d) double loin chops lumbar vertebrae

2. Front Cuts

- a) rib loin chops thoracic vertebrae, proximal rib section
- b) blade scapula (except possibly a portion of the glenoid fossa), part of proximal articulating humerus
- c) neck cervical vertebrae
- d) shoulder humerus (see General cuts)
- e) foreshank all carpals, radius, ulna

3. Genral Cuts

- a) spare ribs all of rib but proximal section (i.e. distal plus medial sections)
- b) whole shoulder roast whole rib

Figure 8: Lamb: Major Butchering Cuts and Carcass Divisions (Parks Canada Artifact Analysis Manual for Historical Archaeology, 1982)

4.4.1 Privy 1

There were fourteen butchered cow bones representing eleven different cuts recovered from Privy 1. The majority of the bones were sawn, but two had been cleaved or cut with a large knife. Hind cuts and front cuts are equally represented in the sample.

Only two bison bones bear butchering marks. These are a femoral head and thoracic vertebrae representing a rump roast and rib roast respectively. Both bones were sawn.

Seventy-two bones belonging to the Bovidae family were butchered. Hind cuts dominated the sample, the most frequent being loin steak, followed by rump roast, shank, butt, and round/sirloin. There were twenty-seven bones which were assignable to front cuts. Sawing seems to have been the preferred butchering method as only ten of the bones were cut or cleaved.

The butchered large mammal bones are primarily assignable to four cuts: short ribs, rib roast, prime rib wing, and brisket. These include sixty rib fragments which, due to the nature of the butchering methods, are unidentifiable to a smaller taxonomical class. In general, the ribs have been initially cut into two pieces, a third and two-thirds of the way down the rib shaft to create a groove. The bones were then snapped along the grooves. Also included in the large mammal butchering class are a number of long bone and vertebral fragments which have been sawn and/or cut, but the exact element is unidentifiable. In other words, this class was used as a catch-all in terms of taxon and element.

However, knowing the subsistence patterns of the Red River Settlement, it is probable that these bones belong to the Bovid or cow family.

There were sixteen sheep bones recovered from Privy 1 which bore butchering marks. Hind cuts and front cuts were equally represented. Bones assignable to these cuts had been sawn, although the "general cut" bones (spare ribs and whole shoulder roast) had been cut and snapped.

The fifteen butchered pig bones showed the same trends as were seen with the species previously discussed. Hind and front cuts were equally represented and all but one had been sawn.

4.4.2 Privy 2

Very few butchered bones were recovered from Privy 2. In total, there were thirty-seven mammalian bones bearing saw and/or knife or cleaver marks. Most of these were classified as large mammal bones and represent a variety of cuts: neck, rib roast, brisket, blade, and short ribs. Bison, cow, pig, and sheep were minimally represented by one or two butchered bones each.

With so few bones representing several cut types, it is hard to identify butchering trends or food preferences. However, in comparison with the Privy 1 sample, no differences were noted in the actual butchering techniques or the resulting cuts of meat.

Chapter V

INTERSITE COMPARISON AND STATISTICAL ANALYSIS

5.1 INTRODUCTION

Privy 1 and Privy 2 collections were compared with each other and with two other sites from the Red River Valley. Finding comparative faunal collections from sites within the Red River and Assiniboine Valley proved to be a difficult task. Only nine sites, in addition to Upper Fort Garry, have been excavated in this geographical area. These sites were Brandon House, Fort Gibraltar, Garden Site, Lower Fort Garry, Fort Garry Gate, Hospital/Jail (Fort Garry Place), Lane's Post, St. Peter's, and Delorme House. Faunal remains from three of the sites, namely Fort Garry Gate, Fort Garry Place and Lane's Post, have not been identified.

Brandon House and Fort Gibraltar predate Upper Fort Garry. In addition, very few, if any, domesticates were identified from the recovered elements, possibly because they predate historic agriculture in the Red River Valley. The Lower Fort Garry collection, although extensive, dates to the time period of the Country Club House, thereby postdating the fort. The Garden Site also presented a more than ample collection, but raw identifications were not available and major problems with discrepancies and interpretations exist in the site report. Thus, only the faunal collections from St. Peter's and Delorme House were available for comparative purposes.

Although these two sites were used, it should be noted that problems exist with their samples as well. St. Peter's Church Dynevor was excavated by the Historic Resources Branch, CHR as part of their pre-impact assessment program. A very small area was excavated, and only a small number of faunal materials was recovered. Screens were not employed, so fish and small bird and mammal bones were probably missed. The Delorme House site yielded a large number of bones, but it was extremely hard to correlate them with the Delorme occupation. Only two areas yielded artifacts which fell within the time range of the Delorme occupation and have therefore been interpreted as Delorme family refuse deposits.

5.2 ST. PETER'S CHURCH DYNEVOR

Excavations were conducted on the grounds of St. Peter's Church
Dynevor in the summer of 1983 by the Historic Resources Branch, Culture,
Heritage, and Recreation. The site (EbLf-28) is located on the east
bank of the Red River north of Selkirk and is the oldest native mission
site in western Canada. Reverend William Cockran, the first Protestant
missionary at the Red River settlement "labored hard and zealously to
collect a few Indians together in order to induce them to throw off
their savage habits, and lead a settled life, with a view to their moral
and religious improvement" (Ross, 1856: 279). By the spring of 1832, he
had convinced three Native families to settle at the extreme lower end
of the colony. Additional families joined this small community, known
as the Indian Community. Cockran writes,

We have now got 9 small houses built at the Indian Settlement. The houses are about 24 ft in length and from 15 to 16 ft in

breadth. They are sufficiently large to admit of a cellar in the centre of the room to deposit the potatoes which may be raised by the proprietor of the house (CMS Records, PAM MG7/82).

A wooden church was started in 1836 and was completed the following year. This structure was replaced in 1853 by a stone building. A school house was constructed in 1834, and a windmill was constructed in 1835 (McLeod and Hart, 1986: 1).

The excavations at the site were initiated

in response to development at St. Peter's Church Dynevor by the Manitoba ARC Authority Inc. in 1983. The ARC Authority constructed a small parking lot and washroom facility north of the church in close proximity to a series of [9] depressions (McLeod and Hart, 1986: 1).

Two one meter square units were dug in one of the depressions. The upper levels were shovelled; lower levels were trowelled. Unit 1 was excavated in the centre of the feature, to a depth of 105 cm. A total of 629 artifacts were recovered; no foundation remains were noted. Unit 2 was excavated at the northern edge of the feature. It was dug to a depth of 85 cm, with 185 artifacts recovered. A rock concentration, indicative of a stone foundation, was encountered at the northwest corner of this unit. Few dateable artifacts were recovered, although the presence of an earthenware sherd with the "Camilla" pattern (post-1833), an 1845 British threepence coin, and a liquor bottle (1860-1890) suggest the deposit dates from 1833 to 1890.

Hand-wrought nails and various construction hardware comprised approximately 23% of the total sample. Based on the relatively early dates recorded and the number of nails and construction hardware, it is believed that this feature "excavated at St. Peter's Church probably

represents a cellar depression that lay beneath one of the buildings constructed at the Indian Settlement" (McLeod and Hart, 1986: 5).

In total, 374 faunal elements were recovered (Tables 11 and 12). Mammals comprised 38.77% of the sample. Both wild and domesticated species were represented to varying degrees.

TABLE 11

List of Identified Fauna, St. Peter's Church, Dynevor

Northern Pike Bald Eagle Cow Goldeye or Mooneye Goose Bison Sucker Pelican Elk Walleye Pig Swan Catfish Marten Canada Goose Mallard Duck Bullhead Muskrat Channel Catfish Rabbit Drumfish Ground Squirrel

Source: McLeod and Hart (1986: 10).

Cow and pig were the only two domesticates identified and made up only 3.5% of the total sample. A wide variety of wild game was identified, species included bison, elk, marten, muskrat, rabbit, and squirrel. Fish made up 38.50% of the sample; eight species were represented. Six avian species were identified and comprised 13.64% of the sample. No domesticated species were noted.

Thus, despite the period of agricultural success from the late 1830s to mid 1850s, the Natives continued to rely on wild game to supplement their diet. This could either have been in the form of subsistence

TABLE 12
Faunal Elements Identified to Species, St. Peter's Church

Species	Elements Recovered	% of Total Excavated Mammalian Elements	% of Total Sampl
Cow	8	5.5	
Cow/Bison	4	2.8	
Bison	7	4.8	
Pig	5	3.5	
Elk	6	4.1	
Marten	11	7.6	
Muskrat	1	.7	
Rabbit	6	4.1	
Squirrel	12	8.3	
Large Mammal	30	20.7	
Medium Mammal	.38	26.2	
Small Mammal	17	11.7	
Total Mammal	145	100.0%	38.77%
Pelican	1	2.0	
Eagle	1	2.0	
Goose	3	5.9	
Duck	2	3.9	
Swan/Duck/Goose		15.7	
Bird	6	11.8	
Large Bird	3	5.9	
Medium Bird	24	47.1	
Small Bird	3	5.9	
Total Bird	51	100.2%	13.64%
Fish	144		38.50%
Mollusc	1		.27%
Unidentified	33		8.82%
Unidentified	33 374	100.0%	8.82

during crop failures or as a way to obtain money and/or supplies through sales of furs (McLeod and Hart, 1986: 9).

Butchering marks were found on 36 elements. These bones represented five possible beef cuts: chuck or pot roast, round or sirloin steak, and short ribs. The bones were not consistently butchered and a variety of tools (saws, knives, axes, and cleavers) were used.

5.3 DELORME HOUSE

The Delorme House is located on the west bank of the Red River, south of Winnipeg, near the town of St. Adolphe. It was built by Pierre Delorme between 1851 and 1865. Delorme was a rather well-to-do gentleman and well-respected within the community. On December 30, 1870, Delorme was one of six Metis elected to the provincial legislative assembly (McLeod, 1982: 6). The following year he ran in the federal riding of Provencher and was elected to the House of Commons. Delorme was also one of the principal personalities of the Red River resistance and a member of Louis Riel's provisional government (McLeod, 1982: 6).

The Delorme site was excavated during the summers of 1980 and 1981. The 1980 excavations were directed by Deborah J. Campbell and were conducted in and directly around the house (McLeod, 1982: 1). Dave McLeod directed the 1981 excavations in the areas north and east of the house. The site was extensively tested archaeologically, but only two areas were securely dateable to the Delorme occupation. Area A, the north kitchen wing, dated to the 1850s. Area B, the dairy/granary, dated from 1861 to the 1880s.

Area A was excavated in 1 meter-square units dug by trowel in 5 cm levels, 2 levels at a time. Area B was initially excavated by two shovel test trenches, one along the east-west axis and one along the north-south axis of the site. A series of 1 meter-square excavation units was later placed east of the building foundation where a concentration of artifacts had been produced in Transit A (McLeod, 1982: 19).

A total of 3505 bones were recovered from the two areas at the Delorme site. Of the 533 bones recovered from Area A, only 126 or 23.6% could be identified (McLeod, 1982: 30) (Table 13).

A variety of species is represented by the Area A bone assemblage, with the remains of both wild and domestic species present. The wild species include bison, moose, rabbit, and fish. Domesticates include pig, cow, and cat. The duck and goose elements were likely domesticated as well (McLeod, 1982: 62).

There were no repeated bone elements, thus the MNI for all species was one.

Area B had a much higher frequency of bone fragments. Of the 2972 bones recovered, only 12.3% could be identified (Table 13). Both wild and domestic species were represented. Pig elements made up 16.6% of the identified species, large mammals represented 64.7% of the unidentifiable total (McLeod, 1982: 168).

Comparisons were made between sites of which the occupants and their social position within the Red River community were known. Upper Fort Garry, Delorme House, and the native village at St. Peter's Church represent upper, middle, and lower class people as defined by the Red River society.

TABLE 13
Faunal Elements Identified to Species, Delorme House

Species	Elements Area A	Recovered Area B	Total	% of Total Excavated Elements	% of Total Sample
Cow	8	45	53	1.7	
Cow/Bison	11	30	41	1.3	
Bison	2	_2	4	.1	
Sheep	· ·	9	9	.3	
Pig	30	61	91	2.9	
Moose	1		51	.1	
Cervidae	1		1	•1	
Rodentia	13	6	19	.6	
Rabbit	3	10	13	.4	
Cat	1	17	18	.6	
Large Mammal	38	866	904	28.8	
Medium Mammal	73	69	142	4.5	
Small Mammal	40	11	51	1.6	
Mammal	110	1686	1796	57.1	
TOTAL			3143	100.0%	89.67%
Goose	.1	5	6	2.4	
Duck	13	21	34	13.8	
Chicken	12	1	13	5.3	
Large Bird	20	20	40	16.2	
Medium Bird	53	28	81	32.8	
Small Bird	44	13	57	23.1	
Bird		16	16	6.5	
TOTAL			247	100.1%	7.04%
Freshwater Drum	1	5	6	7.4	
Walleye		1	1	1.2	
Fish	39	35	74	91.4	
TOTAL			81	100.0%	2.31%
Mollusc	17	15	32		.91%
Amphibian	2		2		.06%
TOTAL	533	 2972	3505		99.99%

5.4 STATISTICAL ANALYSIS

As discussed in Chapter 1, faunal material, if representative of the foods eaten, should reflect the social and economic position of the consumers. In the archaeological evidence, this may be expressed through observable differences in the cuts of meat and the species represented. The four collections were compared using a chi-square test to see if there were statistically significant differences in terms of species utilization and body part/butchering cuts preferred. Because of the varying size of the four collections, it was only possible to compare them statistically at a gross level.

5.4.1 Chi-Square Tests

Three chi-square tests were conducted. For each test, a probability of 95% (α = .05%) was accepted because of the smallness of the sample size that was dealt with.

The first chi-square test was performed to see if there was a difference in reliance upon the three major taxonomic classes: mammal, bird, and bony fish. The null hypothesis stated that mammal, bird, and fish species were equally utilized at the two Upper Fort Garry sites, the Delorme site, and the St. Peter's site.

The chi-square test result for class use was chi-square 2580.30 within six degrees of freedom. This result is unacceptably large given a significance level of 0.05, and so the null hypothesis was rejected.

TABLE 14
Observed and Expected Values (NISP) for Mammal, Bird, and Fish

	Mammal		I	Bird	I		
	ob	ex	ob	ех	ob	ех	Total
UFG Privy 1 UFG Privy 2 Delorme St. Peter's	317 3143	(1332.55) (768.43) (2258.44) (221.22)	64 247	(199.39) (115.10) (338.27) (33.14)	800 81	(515.80) (297.47) (874.28) (85.64)	2048 1181 3471 340
Total	4580		686		1773		7039

The values in the table for the first chi-square test reveal differences in the consumption of mammal, bird, and fish among the four sites. The Delorme collection represents a heavy dependence upon mammalian species for food. Fish elements comprise only 2.3% of the entire sample. By contrast, at Upper Fort Garry Privy 2 (UFG2), fish remains dominate. At St. Peter's and Upper Fort Garry Privy 1 (UFG1), fish elements almost equal the number of mammalian elements. Although this does not mean that both mammals and fish contributed equally to the diet, it does reflect relative usage. Thus, at the Delorme site, it would appear that fish played a minor role in the consumers' diets. The preponderance of fish bone in the UFG2 collection may reflect a higher reliance on fish for food. However, the kind of fish elements recovered in this sample would have to be considered before making any definite statements because fish have so many more bones per individual than most individuals from the other zoological classes.

The table also illustrates that bird species did not contribute as much to the diet at Delorme and UFG2 as they did at both UFG1 and St. Peter's.

A chi-square test was also applied to the data to see whether wild or domestic species were preferred by the consumers. The comparison was done at the family level with Bovidae (cow, sheep), Suidae and Equidae classified as domestic and the following species classified as wild:

Leporidae, Sciuridae, Crictidae, Mustilidae, Corvidae, Antilocapridae, and Bovidae (bison). The null hypothesis stated that wild and domestic species were utilized equally at the two Upper Fort Garry sites and the Delorme and St. Peter's sites.

The result of the chi-square test was chi-square 110.75 with three degrees of freedom. This result is unacceptably large given a significance level of 0.05, and the null hypothesis was rejected.

This chi-square test was conducted using the minimum number of individuals per species (MNI). In the UFG1 and UFG2 collections, there appears to be an almost equal number of wild and domestic animals represented in each. This does not mean, however, that wild and domestic speciees were equally important to the consumer's diet at Upper Fort Garry. The domestic species (cow, sheep, pig) would have provided, on the whole, more meat per individual than the game species represented (rabbit, squirrel, muskrat). At Delorme House, however, the dietary emphasis appears to have been on domestic species. Very few elements from game animals are represented in this collection. On the other hand, wild species dominate the St. Peter's collection.

TABLE 15
Observed and Expected Values (MNI) for Wild and Domestic Species

	Wild		Do	mestic	
	ob	ex	ob	ex	Total
UFG Privy 1	73	(55.34)	69	(86.66)	142
UFG Privy 2	17	(11.30)	12	(17.70)	29
Delorme	19	(63.53)	144	(99.47)	163
St. Peter's	43	(21.83)	13	(34.17)	56
Total	152		238		390

Finally, a chi-square test was employed to see if there was a difference between Upper Fort Garry and the Delorme-St. Peter's collections in their selection of body parts of cow, pig, and sheep. The null hypothesis stated that the Upper Fort Garry and Delorme-St. Peter's collections would be equal in their selection of body parts of cow, pig, and sheep.

The result of the chi-square test was 28.61 with five degrees of freedom. This result is unacceptably large given a significance level of 0.05; hence, the null hypothesis was rejected.

TABLE 16
Observed and Expected Values (NISP) for Cow, Pig, and Sheep

	Podial an Metapodia		Radius, ulna, Femur and Tibia, fibula Immominate		Humerus and Scapula		Vertebrac		Ribs		TOTAL	
	ob ex	ob	ex	ob	ex	ob	ex	ob	ex	ob	ex	
UFG Privy 1 UFG Privy 2	12 (30.3	6) 18	(21.05)	13	(12.24)	11	(9.30)	38	(29.38)	26	(15.67)	118
Delorme St. Peter's	50 (31.6	4) 25	(21.95)	12	(12.76)	8	(9.27)	22	(30.62)	6	(16.33)	123
Total	62	43		25		19		60		32		241

The samples from the four sites reflect significant differences in body part selection of domestic animals for consumption purposes. The Delorme and St. Peter's collections contain a greater number of lower leg bones than the UFG1 and UFG2 collections. These bones (lower leg) are associated with less meatier, poorer quality, and less expensive meat cuts. In comparison, UFG1 and UFG2 samples have a greater number of central body bones (vertebrae, ribs) than the St. Peter's and Delorme collections. These central body bones reflect meat cuts which are meatier, of a higher quality, and more expensive.

The null hypothesis was rejected in all three cases. It was concluded that the chi-square tests were indicative of dissimilarity in the samples in terms of species utilization and body part selection.

5.4.2 Analysis of Variance and T-Tests

In order to compare the preference for specific butchering units between the sites, an analysis of variance was attempted. The butchering units utilized were described in an earlier section. The minimum number of times each cut was represented in each sample was calculated; these were ranked from most expensive to cheapest in terms of their monetary value. This ranking was based on a combination of modern beef prices set by Canada Safeway Ltd. and historic prices from the mid-nineteenth century Sacramento area (Schulz and Gust, 1983: 50).

Table 17 compares both sets of data, showing that there was little difference in the ranking of beef from past to present. In fact, only three anomalies exist. Today sirloin is slightly more expensive than rib roast or prime rib wing, and blade is more expensive than rump. A shank cut is more expensive than a neck cut. The price differences are minimal and to be consistent with previous studies the historic ranking from Schulz and Gust will be accepted for this study.

After determining the rankings that would be utilized, an analysis of variance and a t-test were attempted, but the sample size of butchered bones at a minimum number level was too small for the results to be statistically significant. The tests were not attempted using the number of identifiable specimens (NISP) values because of the problems

TABLE 17
Comparison of Historic and Recent Prices of Beef Cuts

Historic]	Recent
Cut	Rank 	Rank	Cut
Loin Steak	1	1	Loin steak (\$14.97)
Butt/Rib Roast/	2	2	Butt (\$9.02)/Rib
Prime Rib Wing			Roast (\$7.69)/ Prime Rib Wing (\$7.91)
Round/Sirloin	3	3	Round (\$7.47)/ Sirloin (\$8.14)
Rump	4	5	Rump (\$5.55)
Blade	5	4	Blade (\$6.15)
Short Rib/Cross Rib/ Chuck Pot/Soup	6	6	Short Rib (\$5.04)/ Cross Rib (\$6.57 Soup (\$4.37)
Neck	7	8	Neck (\$4.13)
Hind Shank/Foreshank	8	7	Hind shank/fore shank (\$4.37)

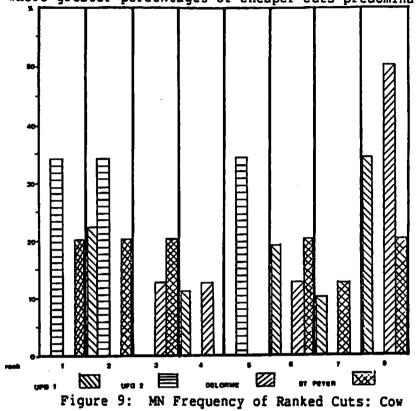
The price given for a Cross Rib roast is for a boneless one and is therefore artificially high.

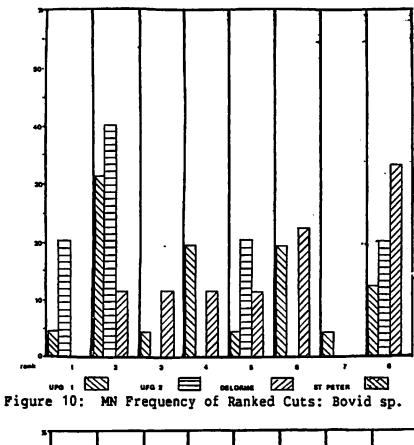
Source: Schulz and Gust, 1983: 50; Canada Safeway Ltd.

inherent with this approach (Grayson, 1978: 53-65). The number of elements per cut varies greatly, so that any comparison based on the number of bones and not the cuts represented would be of little value.

Certain trends are visible at a purely descriptive level. Keeping the same ranking system for cow and Bovid sp., the minimum number of times each unit was represented for all four calculations was determined. This is illustrated in Figures 9, 10, and 11. It clearly shows that the Upper Fort Garry privy collections contain a higher

percentage of expensive cuts compared to the St. Peter and Delorme House sites, where greater percentages of cheaper cuts predominate.





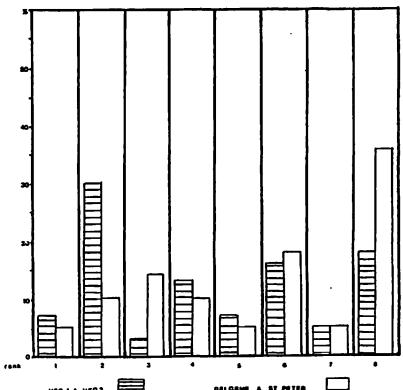


Figure 11: MN Frequency of Ranked Cuts: Cow and Bovid sp.

5.5 ARCHIVAL EVIDENCE

An intensive study was undertaken to determine the price of meat, pork, and mutton in the Red River Settlement. This was an attempt to achieve a better understanding of the economic setting during the mid-1800s. Prices were obtained from a variety of sources, including the HBC Transfer and Account Books for both Upper and Lower Fort Garry and York Factory, and the Nor'wester and Hargrave's Journals. These archival and documentary sources did provide information regarding the monetary cost of the meat available for consumption. However, as can be seen from Table 18, there is little to no price differentiation during the years in which the Sixth Regiment occupied Fort Garry. It is only by the late 1800s that "luxury" items are represented through monetary value in the price indices.

This is not to say that all foods were equally available or that the same quality of meat was equally available to all. The HBC store appears to have been the principal regulator. For example, Warburton, a soldier with the Royal Canadian Rifles posted at Upper Fort Garry in the 1850s described the Fort as "a lonesome and bleak place, no such thing as I'll go and buy this or I'll go and buy that, you can get nothing to buy, beg, or borrow, the Company store is pound (for?), we can get no butter, they supply us with groceries".

Although Warburton was at the fort a decade after the time period in question, one can assume that a similar situation existed in the 1840s. The shopkeeper was ultimately responsible for deciding which local inhabitants were worthy of credit, for ensuring the Company made a

TABLE 18
Price Lists, 1846-1871

	1846	1847	1848	1859	1866	1871
Domestic Beef (per 1b)		2d	2.5d	2.5d	2d	
Veal	2.5d		2.5d			
Buffalo Meat (per 1b)				2d	2d	
Pork (per 1b)			2.5d	4d	8.5d	
Ham	13/4	13/4	13/4			
Mutton (per 1b)	-,	•	2.5d		6 d	
Salt Pork	4d	4d				
Pemmican (per 1b)			2d	4d	4d	1s
Dried Meat (per lb)	2.5d	2d	2.5d	3d	2d	8d
Corned Beef			4d			
Moose Meat					8d	
Moose Nose					2/6	
Chicken					1s	
Beaver Tail					2/6	
Buffalo Tongues	10 d	9d	10 a	1/3	1s	
Bosses			9 d		2/6	

s = shilling

12 pence = 1 shilling 20 shillings = 1 pound

d = pence

/ = shillings/pence

profit on the goods sold (Loewen and Monks, 1986: 18). Knowing the power of the HBC and the influence it had in the RRS, it is probable that the shopkeeper imposed the Company's hierarchical ranking and thus may have offered excellent quality goods to the upper class and average or substandard quality goods to the lower classes.

Decisions of a social nature were also made in the fort and executed throughout the store. J.F. Crofton noted in his journal on 23 December 1846:

The settlers are on this day, and will tomorrow also be, allowed to purchase rum at the Company's store, for their Christmas festivities (Loewen and Monks, 1986: 20).

There also appears to have been differential access to goods within the HBC, including food, according to the hierarchical ranks of the Company. In addition to wages, the Company offered board and lodging as an economic inducement to potential recruits (Goldring, 1979: 145). "The journals and account books imply distinctions between the ranks in terms of differential consumption of goods" (Hamilton, 1985: 384).

Several menu and requisition forms exist from the mid-1800s, indicating the food given to HBC officers and HBC clerks. There is a notable difference in diet between the two. Table 19 gives the supplies for Gentlemen and Male Servants at Lower Fort Garry for the year 1861-1862. Gentlemen received a more varied diet, one made up entirely of fresh meat. The male servants received a plainer diet, of which 63% was dried or processed meat and only 37% being fresh meat.

TABLE 19

HBC Records for Lower Fort Garry, 1861-1862

Male Servants - 4330 lb. pemmican; 4976 lb. fresh beef; 2275 lb. salt beef; 1038 lb. dried meat; 1237 lb. salt pork; 181 lb. sturgeon; 16 lb. ham

Gentlemen - 2735 lb. fresh beef; 84 ducks; 48 doz. eggs; 507 whole fish; 31 fowl (chickens); 9 geese; 233 lb. ham; 437 lb. mutton; 8 sturgeon

Source: Livermore (1976: 129).

This is reinforced by the Officer's Menu from York Factory for December 1838 (Table 20). Officers there received fish, partridge, pork, roast beef, rabbit, salt beef, venison, salt geese, ducks, geese, ham, and tongue.

In 1846, the HBC was given the contract of supplying food for the Sixth Regiment. Because the Regiment was associated with the upper echelons of the HBC it would be expected that they were served the equivalent of an officer's diet. This appears to be corroborated by the archival data. The Company originally offered salted beef to fulfill its obligations, but the soldiers refused it and demanded fresh meat. "As the host of a force which had been instrumental in bringing to the Colony, the Company could do little but accede to the requests" (Ingram, 1970: 50).

The archaeological data parallels the archival data. The Upper Fort Garry Privy 1 collection contains all of the food items which comprised an officer's diet: fish, partridge, pork, fresh beef, rabbit, venison, geese, ducks, and mutton. This perhaps is inconclusive in that almost all of the species are found in the three other collections. Absent from both Privy 2 and St. Peter's is lamb and sturgeon. St. Peter's also lacks partridges, as does the Delorme collection. However, as indicated by the statistics, there is a definite difference in dependence upon various species and selection of body parts for consumption. The faunal collection from St. Peter's shows a reliance on wild animals for subsistence. From the Delorme House assemblage it is obvious that domestic animals were of primary importance to the diet.

TABLE 20
HBC Bill of Fare (Officers), York Factory, 1838

1 Fried fish Soup, stewed partridge, pork chops, potatoes, cheese 2 Beef steak Soup, roast beef, potatoes, pudding, cheese 3 Fried fish Soup, stewed rabbit, boiled partridge, potatoes, tart 5 Fried fish Soup, roast beef, potatoes, cheese 6 Fried fish Soup, roast pork, curried partridge, potatoes 7 Fried fish Soup, roast beef, potatoes, pudding, cheese 8 Fried fish Soup, roast venison, beef steak, potatoes, cheese 9 Beef steak Soup, roast beef, pudding, cheese 10 Fried fish Soup, roast beef, pudding, cheese 11 Fried fish Soup, roast beef, potatoes, cheese 12 Fried fish Soup, roast beef, potatoes, cheese 13 Fried fish Soup, roast pork, partridge, potatoes 14 Fried fish Soup, roast pork, partridge, potatoes 15 Fried fish Soup, roast pork, partridge, potatoes 16 Beef steak Soup, roast beef, potatoes, pudding 17 Fried fish Soup, roast beef, potatoes, pudding, cheese 18 Fried fish Soup, roast beef, potatoes, pudding, cheese 19 Fried fish Soup, roast beef, potatoes, pudding, cheese 10 Fried fish Soup, roast beef, potatoes, pudding, cheese 11 Fried fish Soup, roast beef, potatoes, cheese 12 Fried fish Soup, roast beef, potatoes, cheese 13 Fried fish Soup, roast pork, potatoes, cheese 14 Fried fish Soup, roast partridge, stewed rabbit, potatoes 15 Fried fish Soup, roast pork, potatoes, cheese 16 Fried fish Soup, roast beef, potatoes, pudding, cheese 17 Fried fish Soup, roast beef, potatoes, pudding, cheese 18 Fried fish Soup, roast beef, potatoes, pudding, cheese 19 Fried fish Soup, roast beef, potatoes, cheese 20 Fried fish Soup, roast beef, potatoes, cheese 21 Fried fish Soup, roast beef, potatoes, cheese 22 Fried fish Soup, roast beef, potatoes, cheese 23 Fried fish Soup, roast beef, potatoes, pudding, cheese 24 Fried fish Soup, roast beef, potatoes, potatoes, mince 25 Fried fish Soup, roast beef, potatoes, potatoes, cheese 26 Fried fish Soup, roast beef, potatoes, potatoes, cheese 27 Fried fish Soup, roast beef, potatoes, potatoes, cheese 28 Fried fish Soup, roast beef, potatoes, potatoes, cheese 29 Fried fish Soup,	Date	Breakfast	Dinner
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Fried fish Soup, roast beef, potatoes, boiled ham and tongue, mince pies Fried fish Soup, boiled pork, potatoes, peas, suet pudding Fried fish Soup, roast venison, potatoes, cheese Fried fish Soup, roast beef, potatoes, pudding, cheese	26		
tongue, mince pies 28 Fried fish Soup, boiled pork, potatoes, peas, suet pudding 29 Fried fish Soup, roast venison, potatoes, cheese 30 Fried fish Soup, roast beef, potatoes, pudding, cheese			
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30 Fried fish Soup, roast beef, potatoes, pudding, cheese			

Source: Beaver (1923: 453).

In both Privy 1 and Privy 2 collections the actual number of elements from wild and domestic animals are basically equal, but the domestic animals - cows, pigs, and sheep - would have supplied more meat to the diet. Fish, waterfowl, rabbit, and venison would have been used primarily to add variety to the diet.

As was seen in the statistical analysis, different parts of the body were selected as food items at the four different sites. At Upper Fort Garry, primarily expensive cuts were selected: loin steaks, butt, rib roasts, and prime rib wing. These equate to meatier parts of the body, namely the upper leg, pelvis area, and the vertebral column. Only 37 butchered mammal bones were recovered from Privy 2 as compared to the 121 butchered mammal bones from Privy 1. The difference in amounts is primarily a function of variation in sample size. In comparing the Privy 1 and Privy 2 collections, no differences were noted in the actual butchering techniques or the resulting cuts of meat. Both collections have a higher percentage of high ranked meat cuts than low ranked meat cuts. The butchered Bovid bones from St. Peter's and Delorme House are largely cheaper cuts: short ribs, chuck/pot roasts, soup bones and shank cuts. Similarly, these represent less meatier and hence poorer quality parts of the body.

Chapter VI

CONCLUSIONS

The analysis of the faunal remains from Upper Fort Garry was undertaken with three objectives:

- To reconstruct the pattern of animal utilization during the occupation of Fort Garry with respect to the relative importance of species and butchering practices employed;
- To compare the reconstruction with historical and archaeological records of animal use in the Red River Settlement and surrounding areas during the mid-1800s; and
- 3. To examine the relationship between diet and economic pattern by identifying patterns within the reconstruction and subsequent comparisons which may reflect the economic status of the consumers.

The methods employed to achieve these objectives are outlined in Chapter 3. The methods include the identification and analysis of approximately five thousand bones, and a thorough investigation of archival and documentary sources relating to the mid-1800s.

During the course of excavations at Upper Fort Garry (DILg-21), two privy/refuse pits were uncovered. Only the faunal material recovered from these two structures was analyzed for a number of reasons. Very few bones were recovered from units outside the privy structures and

those that were were found within the fill. In addition, the two structures provided a large enough sample for statistical purposes (i.e. to be representative).

A variety of artifactual material, including glass, ceramics, textiles, and newspapers was used to date the structures (Fifik, 1986: 70-92). Based on this archaeological evidence, it is believed that Privy 1 was in use during the Sixth Regiment of Foot's occupation of Upper Fort Garry, 1846-1848. Indications of the presence and use of the structure by the army include metal military items bearing the insignia of the Sixth Regiment and two fragments of cloth with the names of two of the Regiment's soldiers stamped on them. Privy 2 lacks any military related artifacts and appears to postdate Privy 1 (post-1848).

Chapter 2 describes the development and slow expansion of agricultural pursuits in the Red River Valley. The early settlers had to contend with numerous setbacks such as locusts, frosts, floods, inadequate equipment, and poor storage facilities. Not only were they hundreds of miles away from a viable market in which to sell their goods, but the HBC, whose main interests lay in the fur trade, controlled the small market which was locally available. Even under these adverse conditions, however, the settlers managed to produce food for themselves and to supply the fur trade. Country produce included pemmican, dried meat, cured buffalo tongue, small buffalo bosses, fresh beef, salted pork, fresh pork, cured pork hams, mutton, lard, onions, cabbage, potatoes, butter, cheese, flour, eggs, and wheat.

While relying primarily on agricultural produce for subsistence, the surrounding environment was not ignored. Rabbits, geese, ducks, grouse, fish, and large game animals provided temporary sources of supplies during periods of hardship and added variety to the everyday diet.

Chapter 2 thus outlined the food resource base available to the residents in the Red River valley and the subsistence strategies they employed. It was suggested that there was a differential reliance on domestic and wild products depending upon economic and/or social position and on the time period in Red River history. English and Scottish settlers were primarily agriculturalists, but the native populations relied most heavily upon wild resources, although they did have access to and occasionally produced their own domestic products. The Metis during the early days of the Red River Settlement had been heavily involved in the bison hunts but as herds decreased they turned more and more to agricultural pursuits.

Social status was defined primarily on the basis of economic class. Within the Red River Settlement during the first half of the nineteenth century, a person's occupation was closely aligned with their social position and ethnic affiliation. The social structure of the society was that of a pyramidal hierarchy. In this sense the structure of the Hudson's Bay Company was of a type similar to the social structure of the Red River Settlement. Defining characteristics included ethnic identity, religion, and occupation. At the top of this structure was the Governor of Assiniboia, head of the Red River Settlement and the Hudson's Bay Company (Northern Territories). The next level of the

hierarchy was composed of Hudson's Bay Company officers, civic administrators, and functionaries. These people were primarily Scottish or English. Agriculturalists and skilled tradesmen made up the third tier of the hierarchy. Traditionally these roles were filled by Orkney men, Highlanders, and Englishmen, although by the mid-1800s English-speaking Metis were breaking into these ranks. At the bottom of the hierarchy were the servants, labourers, and seasonal employees. These roles were filled for the most part by natives and English and French-speaking Metis. The Sixth Regiment of Foot was directly associated with the upper echelons of the Hudson's Bay Company and therefore with the Red River Settlement.

As discussed in Chapter 1, food remains provide an excellent data base from which to study economic structuring. Diets are universally characteristic in that they are culture-specific and sometimes even specific to different members in a culture group. It was suggested that if food items are viewed as economic goods, they should reflect the socioeconomic status of their consumers. Thus people belonging to a higher socioeconomic level may be able to enjoy a diet which is more expensive to maintain given the local environment (Reitz and Cumbaa, 1983: 159). In the archaeological evidence, this may be expressed through observable differences in the cuts of meat represented, the species represented in the sample, and the age of the butchered animal.

The faunal material from the privies at Upper Fort Garry were identified to the smallest possible zoological taxon. Special note was made of any natural or cultural modifications (e.g. rodent/carnivore

gnawing, cut marks, heat exposure). Butchered bones were analyzed more closely and were assigned to a particular cut on the basis of the Parks Canada manual.

Research into the relative cost of cuts of meat and meat by-products was completed and the results are outlined in Chapter 4. Although little or no price differentiation was noted during the years in which the Sixth Regiment occupied the fort, the archival evidence clearly suggests differential access to the goods based on social position.

The faunal analysis of the two privies demonstrated a reliance by the consumers on domestic animals for subsistence. Ten percent of the total sample (Privies 1 and 2) were butchered. Butchering cuts were studied and their relative economic cost was assessed. The cuts were ranked from most to least expensive in terms of their monetary value, which was based primarily on the quantity and quality of the meat supplied by each cut. The Upper Fort Garry collections demonstrated a preference for expensive cuts: loin steaks, butt, rib roasts and prime rib wing.

In terms of species utilization, there does not appear to be a difference between UFG1 and UFG2. Mammalian elements dominate the UFG1 collection, whereas fish elements are most numerous in the UFG2 collection. The heavier preponderance of fish bone in Privy 2 may reflect a greater reliance on fish for food. Bird elements make up 15.8% of the Privy 1 sample, whereas they comprise only 5.5% of the UFG2 sample. This also suggests differences in selection and consumption of food items.

The comparison of the faunal assemblage for Delorme House and St.

Peter's Church Dynevor suggest differences in terms of species

utilization and meat cuts selected. The St. Peter's collection

demonstrated a reliance on wild animals by the natives for subsistence.

From the Delorme House assemblages it is obvious that domestic animals

were of primary importance in the family's diet. The butchered Bovid

bones from both St. Peter's and Delorme House are largely cheaper cuts:

short ribs, chuck/pot roasts, soup bones, and shank cuts. This

selection was interpreted as representing economic necessity as opposed

to taste preferences.

Statistical analysis of the data was successful at a gross level.

However, the smallness of the sample size of butchered bone from all four collections precluded any statistically significant testing. Thus, analysis of economic variability was conducted at a purely descriptive level. Minimum numbers of beef cuts were used as the unit of analysis because of the problems inherent in NISP values (deceptive frequencies and potential interdependence of counted bone specimens). The cost-efficiency of beef cuts was not utilized as the unit of analysis because too many uncontrollable variables were involved. Most importantly, "it is not possible to demonstrate empirically that cost-efficiency of beef purchases as reflected by meat yield is tightly correlated with purchasing power, income level, or economic class" (Lyman, 1987: 62).

This thesis examined the faunal material material from three sites in the Red River Valley: Upper Fort Garry, Delorme House, and St. Peter's Church Dynevor. A thorough examination was conducted of the archival sources relating to the period in question (1812-1850). This extensive research provided an excellent understanding of the time period and society in question, thereby allowing a more accurate interpretation of the cultural context from which the faunal collection was derived. Although the historical data accumulated was regionally and temporally limited, a methodological framework for the economic analysis of faunal samples was successfully established. The results of this particular analysis indicate differing animal utilization in terms of species and body parts selected. The choice of food items reflect different social and economic contexts at each of the sites examined.

Thus, in conclusion, faunal material can be a vital tool in assessing the economic position of the consumers and aid greatly in the interpretation of Upper Fort Garry.

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Appendix A

CODING FORMAT

Column	Variable	Code
1-6	Site	DILg-21
7-10	North Unit	N 01-999
11-14	South Unit	S 01-999
15-16	Level	01-99
17-18	Stratum	01-99
19-22	Depth below stratum	1-9999
23-26	South provenience	1-9999
27-30	West provenience	1-9999
31-36	Catalogue number	1-99999
37-38	Class	Artifact analysis manual for historic archaeology, Parks Canada
39-48	Taxon	See Appendix
49-53	Anatomical Element	See Appendix
54-55	Portion of Element	See Appendix
56-57	Segment of Portion	See Appendix
58-60	Quantity	
61-66	Weight (grams)	000.00-999.99
67	Side	1=left; 2=right
68	Fusion	<pre>1=complete; 2=partial; 3=unfused; 4=one epiphysis fused, one missing</pre>

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69	Eruption	<pre>0 or 1=complete eruption; 2=partial eruption; 3=unerupted</pre>
70-71	Burn	1=burn/charred; 2=calcined
72	Juvenile Cortex	1=present; 2=foetal
73	Break	1=present
74	Butchering	<pre>1=cut; 2=cut and sawn; 3=sawn; 4=split</pre>
75	Flake	<pre>1=a flake of bone; 2=a flaked object</pre>
76	Other	1=gnawed; 2=weathered, cortex flaking, or missing; 3=paint; 4=dental carie; 5=medullary bone; 6=drilled; 7=polished
77	Re-Examine	<pre>1=re-examine part; 2=re-examine taxon; 3=re-examine part and taxon</pre>
78-80	Bone Number	001-999

Appendix B TAXONOMIC COMPUTER CODING SYSTEM

Class Ol: Mammalian

ORDER	FAMILY	GENUS	SPECIES	DISCOVERER	COMPON NAME
Insectivora 01	Soricidae 01	Sorex 01	cinereus 01 vagrans 02 palustris 03 arcticus 04 finmeus 05	Nerr 7 Richardson Nerr	Masked Shrew Wandering Shrew American Watering Shrew Arctic Shrew Smoky Shrew
	J	Mcrosorex 02	hoy1 01	(Baird)	Pigmy Shrew
	·	Dlarina 03	brevicauda 01	(Say)	Short-tailed shrew
	Talpidae 02	Condylura 01	cristata 01	(Linnaeus)	Star-nosed Hole
Chiroptera 02	Vespertilionidae 01	Myotis (1)	lucifugus 01 keenii 02	(Le Conte) (Merriam)	Little-Brown Bat Keen's Bat
		Lasionycteris 02	moctivagans 01	(Le Conte)	Silver-haired Bat
		Eptesicus 03	fuscus 01	(Palisot de Beavois)	Big Brown Bat
		Lasiurus 04	borealis 01 cinereus 02	(Müller) (Palisot de Beavois)	Red Bat Hoary Bat
Primates 03	Hominidae 01	Нопо 01	sapiens 01	Linnaeus	Man
Lagomorpha 04	Leporidae 01	Sylvilagus 01	floridanus 01	(J. A. Allen)	Eastern Cottontail
i		Lepus 02	americanus 01 townsendii 02 domestic 03	Erxleben Bachman	Snowshoe Hare White-tailed Jack Rabbit Domestic Rabbit
Rodentia 05	Sciuridae 01	Tamias 01	striatus 01	(Linnaeus)	Eastern Chippunk
3		Eutamías 02	minimus 01	(Bachman)	Least Chipmunk

Class 01: Mammalian continued

ORDER Rodentia 05

FAHILY	GENUS	SPECIES	DISCOVERER	COMION NAME
Sciuridae 01	Marmota 03	monax 01	(Linnaeus)	Woodchuck
	Citellus 04	richardsonii 01 tridecemlineatus(2 franklinii 03	(Sabine) ! (Hitchell) (Sabine)	Richardon's ground squirrel 13-lined ground squirrel Franklin's ground squirrel
	Scaurus 05	carolinensis 01 niger 02	Gmelin	Grey/Black squirrel Eastern Fox squirrel
	Tamiasciurus 06	hudsonicus 01	(Erxleben)	American Red-squirrel
	Glaucomy.s 07	sabrinus 01	(Shav)	N. Flying squirrel
Geomyldae 02	Тһожовуя 01	talpoides 01	(Richardson)	Northern Pocket Gopher
	Geomys 02	bursarius Ol		Plains Pocket Gopher
Heteromyidae 03	Perognathus 01	fasciatus 01		Olive-backed Pocket House
Castoridae 04	Castor 01	canadensis 01	Kuh1	Beaver
Cricetidae 05	Peromyscus 01	maniculatus 01		Deer Kouse
		*Leucopus 02		White-footed Mouse

Class 01: Mammallan Continued

ORDER Rodentia 05

COPPON NAME	Western Harvest Mouse	Northern Grasshopper Mouse	Boreal Redback Vole	Heather Vole	Prairie Vole Headow Vole	Muskrat	Northern Bog Leming Southern Bog Leming	Norway Rat	House Mouse	Headow Jumping House Western Jumping House
DISCOVERER				Merriam	(Wagner) (Ord)	(Linnaeus)	(Richardson)	(Berkenhout)	(Linnaeus)	(Zimerman)
SPECIES	*megalotis 01	leucogaster Ol	gapper1 01	intermedius 01	ochrogaster 01 pennsylvanicus 02	zibethica Ol	borealls 01 cooperi 02	**norvegicus 01	**musculus 01	hudsonius 01 princeps 02
GENUS	Reithrodontomys 02	Onychomys 03	Clethrionomys 04	Phenacomys 05	Microtus 06	Ondatra 07	Ѕупартошуя 08	Rattus 01	Нив 02	2apus 01
FAMILY	Cricetidae 05							Muridae 06		Zapod1dae 07

Class Ol: Marmallan Continued

	COLETON NAME	Woodland Jumping Mouse	Porcupine	Coyote Wolf	Red Fox Coloured Fox Kit Fox	Grey Fox	Black Bear Grizzly Bear	Raccoon	Anerican Marten Fisher	Ermine Longtailed Wessel Least Wessel Mink
cinued	DISCOVERER		(Linnaeus)	Say Linnaeus	(Linnaeus)	(Schreber)	Pallas	(Linnaeus)	(Turton) (Erxleben)	Linnaeus Lichtenstein Schreber
Class UI: Mammallan Continued	SPECIES	insignie 01	dorsatum 01	latrans Ol lupus O2	vulpes Ol fulva O2 velox O3	cinereoargenteus 01	americanus 01 **horribilis 02	lotor Ol	americana 01 pennanti 02	erminea Ol frenata O2 rixosa O3 vison O4
Class	CENUS	Napaeozapus 02	Erethizon 01	Cenis 01	Vulpes 02	Urocyon 03	Ursus Ol	Procyon 01	Martes 01	Mustela 02
	FAHILY	Zapodidae 07	Erethizontidae 08	Canidae 01			Ursidae 02	Procyonidae 03	Mustelidae 04	
	ORDER	Rodentia 05		Carnívora 06						

Class 01: Mammalfan Continued

COMMON NAME	Wolverine	American Badger	Striped Skunk	River Otter	Mountain Lion	Lynx Bobcat	Mule Dear White-tailed Deer	Wapiti/Elk	Mose	Caribou	Bison
DISCOVERER		(Schreber)	(Schreber)	(Schreber)	Linnaeus	(Linnaeus) (Schreber)	(Rafinesque) (Zimmerman)				(Linneaus)
SPECIES	luscus Ol	taxus Ol	mephicis Ol	canadensis 01	concolor 01	lynx Ol rufus O2	hemionus 01 virginianus 02	canadensia Ol	alces Ol	tarandus 01	bison Ol
GENUS	Gulo 03	Taxidea 04	Hephitis 05	Lontra 06	Felis 01	Lynx 02	Odocolleus 01	Cervus 02	Alces 03	Rangifer 04	Bison Ol
FAMILY	Mustelldae 04				Felidae 05		Cervidae 01				Bovidae 02
ORDER	Carnivora 06						Artiodactyla 07				

Class Ol: Marmalian Continued

Class UI: Nammallan Continued	US SPECIES DISCOVERER COPPON NAME	02 tauros 01 Domestic Cow	ra 03 hirca 01 Goat	s O4 aries O1 Sheep	01 scrofa 01 Pig	ilocapra 01 americana 01	us Ol caballus Ol					
ont Inned	DISCOVERER											
UI: Mammallan C	SPECIES		hirca 01	aries Ol		L				·		
Class	CENUS		Capra 03	Ovis 04	Sus 01	Antilocapra 01	Equus 0.1					
	FAMILY	Bovidae 02			Suldae 03	Antilocapridae 04	Equiidae 01					
•	ORDER	Artiodactyla 07					Perissodaciyla Equildae 05	Large 09	Large-medium 10	Hedium 11	Medium-small 12	Small 13

...

Class 03: Avian

ORDER	FAHILY	SUB-FAHILY	CENUS	SPECIES	DISCOVERER	COPPON NAME
Gaviiformes Ol	Gaviidae 01		Gavia 01	imer 01	(Brunnich)	Common Loon
Podicipediformes 02	Podicipedidae Ol		Podiceps 01 Podiceps 01 Podilymbus	grisegena 01 auritus 02 podiceps	(Boddaert) (Linnaeus) (Linnaeus)	Red-necked Grebe Homed Grebe Pied-Billed Grebe
Pelecaniformes 03	Pelecanidae 01		Pelecanus Ol	erythrorhynchos 01	Gmelin	White Pelican
	Phalacrocoracidae 02		Phalacrocorax 01	auritus 01	(Lesson)	Double-crested cormorant
Ciconiiformes O4	Ardeidae 01		Ardea 01 Casmerodius 02 Nycticorax 03 Ixobrychus 04 Botaurus 05	herodias 01 albus 01 nycticorax 01 exilis 01	Linnaeus (Linnaeus) (Linnaeus) (Gmelin) (Rackett)	Great Blue Heron Common Egret Blk-crowned night Heron Loast Bittern American Bittern
Anser Lformes 05	Anatidae 01	Cygninae 02	0lor 01 0lor 01	columbianus 01 buccinator 02	(Ord) (Richardson)	Whistling Swan Trumpeter Swan (K)
		Anserinae 03	Branta 01 Anser 02 Anser 02 Chen 03 Chen 03	canadensis 01 albifrons 01 domesticus 02 caerulescens 01 rossii 02	(Linnaeus) (Scopoli) (Linnaeus) (Cassin)	Canada Goose White-fronted Goose (If) Domestic Goose Snow Goose (M) Ross's Goose (M)

Class 03: Avian continued

Anseriformes 05	FAMILY Anatidae 01	Aythyinae Oxyurinae Oxyurinae Of	CENUS Anas 01 Aythya 01 Aythya 01 Aythya 01 Aythya 01 Bucephala 02 Bucephala 02 Bucephala 02 Bucephala 02 Helanitta 03 Otdemia 04 Coxyura 01 Hergus 02	SPECIES platyrhynchos 01 rubripes 02 acrea 03 acuta. 04 carolinensis 05 discors 06 boschas domestica americana 01 clypeata 01 sponsa 01 collaris 02 valisineria 03 affinis 04 clangula 01 albeola 02 deglandi 01 nigra 01 merganser 01 merganser 01	Linnaeus Brewster Linnaeus Caelin Linnaeus Caelin (Caelin) (Linnaeus) Linnaeus	Hallard Black Duck Galdwell Pintail Green-Winged Teal Blue-Winged Teal Buserican Widgeon Shoveler Wood Duck Canvasback Lesser Scaup Common Golden Eye Bufflehead White-winged Scoter Common Scoter Gommon Scoter Gommon Merganser
				serrator 02	Linnaeus	Red-breasted Merganser
Falconiformes 06	Cathartidae Oi Accipitridae Ol		Cathartes 01 Accipiter 01 Accipiter 01	gentils 01	(Linnaeus) (Linnaeus) Vieillot	Turkey vulture Goshavk Sharp-shinned Havk

Class U3: Avian continued

ORDER	FAHILY	SUB-FAHILY	CENUS	SPECIES	DISCOVERER	COPPION NAME
Charadriiformes 09	Charadriidae 01	-	Charadrius Ol Charadrius Ol	melodus 01 vociferus 02	Ord Linnaeus	Piping Plover Kilidear
	Scolopacidae 02		Scolopax 01 Scolopax 01 Numenius 02 Bartramia 03 Actitis 04 Limosa 05	minor 01 rusticola 02 smericanus 01 longicauda 01 macularia 01 fedos 01	(Gmelin) Linnaeus Bechstein (Bechstein) (Linnaeus) (Linnaeus)	American Woodcock European Woodcock Long-billed Curlew Upland Plover Spotted Sandpiper Marbled Godult
	Recurvirostridae 03		Recurvirostra Ul	americana Ol	Gmel in	American Avocet
	Phalaropodidae 04		Phalaropus Ol	tricolor 01	(Vieillot)	Wilson's Phalarope
	Laridae 05		Larus 01 Larus 01 Larus 01 Larus 01 Sterna 02 Sterna 02 Chlidonias 03	argentatus 01 californicus 02 delawarensis 03 pipixcan 04 philadelphis 05 forsteri 01 hirundo 02 niger 01	Pontoppidan Lawrence Ord Wagler (Ord) Nuttall Linnaeus	Herring Gull California Gull Ring-billed Gull Franklin's Gull Bonaparte's Gull Forester's Tern Common Tern Black Tern
Columbiformes 1U	Columbidae Ol		Columba 01 Zenaida 02 Ectopistes 03	livia 01 macroura 01 migratorius 01	Gmelin (Linnaeus) (Linnaeus)	**Rock Dove Mourning Dove Passenger Pigeon

Class 03: Avian continued

	FAHILY	SUB-FAMILY	GENUS	SPECIES	DISCOVERER	CONTINUE MAYE
Unculliornes 11	01		Coccyzus of	11mus	(Linnaeus) (Vilson)	Tellow-Dilled Cuckoo Black-billed Cuckoo
Strigiformes 12	Strigidae 01		Otus 01 Bubo 02 Nyctea 03 Surnia 04 Spectyto 05 Strix 06 Strix 06 Asio 07 Asio 07 Asgolfus 08 Aegolfus 08	asio 01 virginianus 01 scandiaca 01 ulula 01 cunicularia 01 varia 01 nebulosa 02 otus 01 flammeus 02 funereus 01 acadicus 02	(Linnaeus) (Gwelin) (Linnaeus) (Linnaeus) (Molina) Barton Forster (Linnaeus) (Linnaeus) (Linnaeus)	Screech Owl Great Horned Owl Snowy Owl Hawk Owl (N. Hawk Owl) Burrowing Owl Barred Owl Creat Gray Owl Long-eared Owl Short-eared Owl Saw-whet Owl
Caprimulgiformes 13	Caprimulgidae 01		Caprimulgus Ol Chordeiles O2	vociferus Ol minor Ul	Wilson (Forster)	Whip-poor-will Common Nighthawk
Apodiformes 14	Apodidae Ul		Chaetura 01	pelagica 01	(Linnaeus)	Chimney Swift
	Trochilidae 02		Archilochus Ul	colubris 01	(Linnaeus)	Ruby-Throated Hummingbird
Coraciiformes 15	Alcedinidae 01		Ceryle 01	alcyon 01	(Linnaeus)	Belted Kingfisher
Piciformes 16	Picidae		Colaptes Ul Dryocopus 02 Helamerpes 03 Sphyrapicus 04 Picoides 05 Picoides 05 Picoides 05	auratus 01 pileatus 01 erythrocephalus 01 varius 01 villosus 01 pubescens 02 arcticus 03 tridactylus 04	(Linnaeus) (Linnaeus) (Linnaeus) (Linnaeus) (Linnaeus) (Linnaeus) (Linnaeus) (Linnaeus)	Yellow-shafted Flicker Pileated Woodpecker Red-headed Woodpecker Yellow-billed Woodpecker Hairy Woodpecker Bown Woodpecker Three-toed Woodpecker

Class U3: Avian continued

ORDER Passer1formes 17

FAMILY	SUB-FAMILY	GENUS	SPECIES	DISCOVERER	COPPION NAME
Tyrannidae 01		Tyrannus 01 Tyrannus 01 Tyrannus 01 Mytarchus 02 Sayornis 03 Empidonax 04 Empidonax 04 Contopus 05 Contopus 05	tyrannus 01 verticalis 02 crinitus 01 phoebe 01 traillif 01 minimus 02 virens 01 borealis 02	(Linnaeus) {ay (Linnaeus) (Latham) (Audubon) (Baird & Baird) (Linnaeus) (Swainson)	Eastern Kingbird Western Kingbird Great Crester Flycatcher Eastern Phoebe Willow Flycatcher Least Flycatcher Eastern Wood Pever Olive-sided Flycatcher
Alaudidae 02		Eremophila 01	alpestris Ol	(Linnaeus)	Horned Lark
Hirundinidae 03		Iridoprocne 01 Riparia 02 Stelgidopteryx 03 Hirundo 04 Hirundo 05 Progne 05	bicolor 01 riparia 01 serripennis 01 rustica 01 pyrrhonota 02.	(Vieillot) (Linnaeus) (Audubon) Linnaeus Vieillot (Linnaeus)	Tree Swallow Bank Swallow Rough-Winged Swallow Barn Swallow Cliff Swallow Purple Martin
Corvidae 04		Perisoreus Ol Cysnocitta O2 Pica O3 Corvus O4 Corvus O4	canadensis Ol cristata Ol pica Ol corax Ol brachyrhynchos	(Linnaeus) (Linnaeus) (Linnaeus) Linnaeus Brehm	Gray Jay Blue Jay Black-billed Magpie Common Raven American Crow
Paridae 05		Parus Ol Parus Ol	atricapillus Ol hudsonicus O2	Linnaeus Forster	Black-capped Chickadee Boreal Chickadee
Sittidae 06		Sitta Ol Sitta Ol	carolinensis Ol canadensis U2	Latham Linnaeus	White-breasted Nuthatch Red-breasted Nuthatch

Class 03: Avian continued

ORDER Passerlformes 17

FAHILY	SUB-FAHILY	GENUS	SPECIES	DISCOVERER	COMMON NAME
Certhiidae 07		Certhiia 01	smericana 01	Linnaeus	Brown Creeper
Troglodytidae 08		Troglodytes Ul Troglodytes Ul Cistothurus U2 Cistothorus U2	aedon 01 troglodytes 02 palustris 01 platensis 02	Vieillot (Linnaeus) (Wilson) (Latham)	House Wren Winter Wren Marsh Wren Sedge Wren
Mimidae 09		Mimus 01 Dumetella 02 Toxostoma 03	polyglottos 01 carolínensis 01 rufum 01	(Linnaeus) (Linnaeus) (Linnaeus)	Northern Mockingbird Catbird Brown Thrasher
Turdidae 10		Turdus 01 Catharus 02 Catharus 02 Catharus 02 Sialia 03 Sialia 03	migratorius Ol guttata Ol ustulata O2 fuscescens O3 sialis Ol	Linnaeus (Pallas) (Nuttall) (Stephens) (Linnaeus) (Bechsteln)	American Robin Hermit Thrush Swainson's Thrush Veery Eastern Bluebird Mountain Bluebird
Sylviidae 11		Regulus Ol Regulus Ol	satrapa 01 calendula 02	Lichtenstein (Linnaeus)	Golden-Crowned Kinglet Ruby-Crowned Kinglet
Hotacillidae 12		Anthus 01	spragueii Ol	(Audubon)	Sprague's Pipit
Bombycillidae 13		Bombycilla 01	cedrorum 01	Vieillot	Cedar Waxving
Laniidae 14		Lanius Ol	ludovicianus Ul	Linnaeus	Loggerhead Shrike

Class 03: Avian continued

ONDER Passer I formes

FAHILY	SUB-FAHILY	CENUS	SPECIES	DISCOVERER	COMPOU NAME
Sturnidae 15		Sturnus ol	vulgaris 01	Linnaeus	**Comon Starling
Vireonidae 16		Vireo 01 Vireo 01 Vireo 01 Vireo 01 Vireo 01	flavifrons 01 solitarius 02 olivaceus 03 philadelphicus 04 gilvus 05	Vieillot (Wilson) (Linnaeus) (Cassin) (Vieillot)	Yellow-throated Vineo Solitary Vireo Red-eyed Vireo Philadelphia Vireo Warbling Vireo
Parulídae 17		Minotilta 01 Vermivora 02 Vermivora 02 Vermivora 02 Vermivora 02 Parula 03 Dendroica 04 Dendroica 06 Dendroic	varia 01 chrysoptera 01 peregrina 02 celata 03 ruticapilla 04 americana 01 magnolia 01 tigrina 02 tigrina 03 tigrina 03 tigrina 05 fusca 06 pensylvanica 07 castanea 07 castanea 08 palmarum 09 aurocapillus 01 novaboracensis 02 trichas 01 pusilla 01 ruticilla 01	(Linnaeus) (Linnaeus) (Milson) (Say) (Wilson) (Linnaeus) (Linnaeus) (Milson) (Gmelin) (Gmelin) (Gmelin) (Gmelin) (Gmelin) (Gmelin) (Gmelin) (Milson) (Gmelin) (Milson) (Gmelin) (Milson) (Linnaeus) (Wilson) (Linnaeus) (Wilson) (Linnaeus) (Wilson) (Linnaeus) (Wilson) (Linnaeus) (Wilson) (Linnaeus)	Black & White Warbler Golden-winger Warbler Tennessee Warbler Orange-crowned Warbler Nashville Warbler Paulia Warbler Manolia Warbler Cape May Warbler Cape May Warbler Richroated Grn. Warbler Blk-throated Grn. Warbler Blackburnian Warbler Chestnut-sided Warbler Bay-Breasted Warbler Palm Warbler Ovenbird Northern Waterthrush Connecticut Warbler Wourthern Waterthrush Connecticut Warbler Gownon Yellowthroat Wilson's Warbler Gomada Warbler Common Yellowthroat Walson's Warbler Common Yellowthroat
icteridae 18		Dolichonyx 01 Sturnella 02 Xanthocephalus	oryzivorous 01 neglects 01 xanthocephalus 01	(Linnaeus) Audubon (Bonaparte)	Bobolink Western Meadowlark Yellow-headed Blackbird

Class 03: Avian continued

944	l vitita l		o Bratio	Cur	201700		and	anta acidos
	- Land	191101	CENCO	5	3		DISCOVERER	COLUMN WATER
Passeriformes	Icteridae 18		Agelatus 04		phseniceus	55	(Linnaeus)	Red-winged Blackbird
i			Euphagus 06		8	10	(Muller)	Rusty Blackbird
		-		_	halu	8 0 2	(Wagler)	Brewer's Blackbird
				_	cula	2	(Linnaeus)	Common Grackle
			Molothrus 08	8 ater		6	(Boddaert)	Brown-headed Cowbrid
				+		1		
	Frigillidae		Cardinalis (01 care	cardinalis	10	(Linneaus)	Cardinal
	19		80	_	ludovicianus		(Linneaus)	Rose-breasted Grosbeak
			Passerina (03 cyanea	nea	50	(Linneaus)	Indigo Bunting
			Spira	_	americana	5	(Cmelin)	Dickcissel
			Coccothraustes	_	vespertinus	10	(Cooper)	Evening Grosbeak
			_	05				
			acua		purpureus	<u>ت</u>	(Gmelin)	Pruple Finch
			Spinus	07 pfnus	18	10	(W118on)	Pine Siskin
			Spinus (_	tristis	07	(Linnaeus)	American Goldfinsh
			Loxia		curvirostra	10	(Linnaeus)	Red Crossbill
			Pipilo (09 ery	erythrophthalmus	1mg	(Linnaeus)	Rufous-sided Towhee
						01		
			80		sandwichensis Ol	s 01	(Gmelin)	Savannah Sparrow
			Armodramus 1		savannarum		(Gme11n)	Grasshapper Sparrov
			Armodramus 1	_	bairdii	05	(Audubon)	Baird's Sparrow
			Passerherbulus	_	caudacutus	70	(Latham)	Le Conte's Sparrow
								,
			6		caudacutus	5	(Cmelin)	Sharp-tailed Sparrow
					gramineus	10	(Gmel1n)	Vesper Sparrow
			setes		grammacus	10	(Say)	Lark Sparrow
				16 hyer	hyemalis	10	(Linnaeus)	Slate-Colored Junco
				_	passerina	20	(Bechstein)	Chippling Sparrow
			Spizella	_	pallida	05	(Swainson)	Clay-colored Sparrow
			Spizella	17 pus:	pusilla	93	(Wilson)	Field Sparrow
			a T	_	albicollis	5	(Gmelin)	White-throated Sparrow
			Melospiza	_	lincoinii	5	(Audubon)	Lincoln's Sparrow
					georgiano	10	(Latham)	Swamp Sparrow
			Melospiza	19 Melo	Melodia	5	(Wilson)	Song Sparrow
								-

TAXON CODES - OSTEICHTHYES (CLASS 04)

ORDER Petromyzontiformes 01	FAMILY Petromyzontidae 01 01	GENUS Ichthyomyzon 01	SPECIES castaneus 01 unicuspis 02	DISCOVERER Glrard Hubbs & Trautman	COMMON NAME Chestnut Lamprey Silver Lamprey
Acipenseriformes 02 (Chondrostei)	Acipenseridae Ol	Acipenser 01	fulvescens Ol	Rafinseque	Lake Sturgeon
Clupeiformes 03	Salmonidae 01	Salmo 01 Salvelfnus 02 Coregonus 03	gairdneri 01 namaycush 01 artedii 01 nigripimis 02 zenithicus 03 clupeaformis 04	Richardson (Walbaum) Leseur (G111) (Jordan & Evermann) (Mitchell)	Rainbow Trout Lake Trout Cisco, Lake Herring Blackin Cisco Shortjaw Cisco Lake Whitefish
	Hiodontidae 02	Hlodon 01	slosoides Ol tergisus O2	(Rafinesque) Legueur	Goldeye Hooneye
	Umbridae 03	Umbra Ol	11m1 01	(Kirtland)	Central Hudminnow
	Esocidae 04	Евох 01	lucius 01	(Linnaeus)	Northern Pike
Cypriniformes 04	Cyprinidae 01	Couesius U1 **Cyprinus 02 Hybopsis 03 Nocomis U4 Notemigonus 05 Notropis 06	plumbeus 01 carpio 01 storeriana 01 biguttatus 01 crysoleucas 01 antherinoides 01 blennius 02 cornutus 03 heterolepis 04 hudsonius 05	(Agassiz) Linneaus (Kirtland) (Kirtland) (Kirtland) (Hitchell) Rafinesque (Girard) (Hitchill) Eigenmann & Eigenmann (Clinton)	Lake Chub Carp Silver Chub Hornyhead Chub Golden Shiner Emerald Shiner River Shiner Common Shiner Blacknose Shiner Spottail Shiner

TAXON CODES - OSTEICHTHYES (CLASS 04) CONTINUED

ORDER	FAHILY	CENUS	SPECIES	DISCOVERER	COMMON NAME
Cypriniformes O4	Cyprinidae 01	Notropis O6 Pimephales O7 Platygobio O8 Rhinichthys O9 Semotilus 10	stramineus 07 volucellus 08 notatus 01 promelas 02 gracilis 01 atratulus 01 cataractae 02 atromaculatus 01 margarita 02	(Cope) (Cope) (Rafinesque) (Rafinesque) (Richardson) (Hermann) (Valenciennes) (Mitchill) (Cope)	Sand Shiner Himic Shiner Bluntnose Hinnow Fathead Minnow Flathead Chub (Rare) Blacknose Dace Longnose Dace Creek Chub
	Catostomidae 02	Carpiodes 01 Catostomus 02 Ictiobus 03 Moxostoma 04	cyprinus Ol catostomus Ol commersoni O2 cyprinellus Ol anisurum Ol macrolepidotum O2	(Lesueur) (Forster) (Lacépède) (Valenciennes) (Rafinesque) (Lesueur)	Quillback Longnose Sucker White Sucker Bigmouth Buffalo (rare) Silver Redhorse
	Ictaluridae 03	Ictalurus Ol Noturus O2	melas Ol nebulosus O2 punctatus O3 flavus O1 gyrinus O2	(Rafinesque) (Lesueur) (Rafinesque) (Rafinesque) (Mitchell)	Black Bullhead Brown Bullhead Channel Carfish Stonecat Tadpole Hadtom
Cyprinodontiformes 05	Cyprinodontidae 01	Fundulus Ol	diaphanus 01	(Lesueur)	Banded Killifish
Gadiformes 06	Gadidae Ol	Lota 01	lota 10	(Linneaus)	Burbot
Gasterostelformes 07	Gasterosteidae 01	Culaea Ol Pungitius O2	inconstans Ol pungitius Ol	(Kirtland) (Linnaeus)	Brook Stickleback Ninespine Stickleback

TAXON CODES - OSTEICHTHYES (LCASS 04) CONTINUED

				and the second second	
ORDER	FAMILY	CENUS	SPECIES	DISCOVERER	COMMON NAME
Percopsiformes 08	Percopsidae 01	Percopsis 01	omiscomaycus Ol	(Walbaum)	Trout-perch
Perciformes 09	Percichthyidae 01	Morone 01	chrysops 01	(Rafinesque)	White Bass (First reported in 1963)
	Centrarchidae 01	Ambloplites 01 Lepomis 02 Micropterus 03 Pomoxis 04	rupestris Ol gibbosus Ol macrochirus dolomieui salmoides nigromaculatus Ol	(Rafinesque) (Linnaeus) Kaphinesque Lacepede (Lacepede)	Rock Bass Pumpkinseed Bluegill (In Red River-USA) Smallmouth bass Largemouth bass Black Crappie
••	Percidae 02	Perca Ol Stizostedion O2 Etheostoma O3 Percina O4	flavescens 01 canadense 01 vitreum 02 exile 01 nigrum 02 caprodes 01 maculata 02 shumardi 03	(Mitchell) (Smith) (Mitchill) (Girard) Rafinesque (Rafinesque) (Girard)	Yellow Perch Sauger Walleye Iowa Darter Johnny Darter Logperch Blackside Darter River Darter
	Scisenidae 03	Aplodinotus Ol	grunniens Ol	Rafinesque	Freshwater Drum
	Cottidae 04	Cottus 01 Myoxocephalus 02	bairdi Ol cognatus O2 ricei O3 quadricornis Ol	Girard Ricahrdson (Nelson) (Linnaeus)	Mottled Sculpin Slimy Sculpin Spoonhead Sculpin Deepwater Sculpin

Appendix C ANATOMICAL ELEMENTS COMPUTER CODING SYSTEM

FIELD BODY PART

10000 ZONE HEAD
10001 TEMPORAL CONDYLE
10002 TONGUE BONE

```
11000 CRA
              CRANIAL INDET OR CRANIUM COMPLETE
11001
       BCS
              BRAINCASE
11002
       PMX
              PREMAXILLA
11003
       PMXT
             PREMAXILLA WITH TEETH
11004
       MAX
             MAXILLA
11005
       MAXT
             MAXILLA WITH TEETH
11006
       PAL
              PALATINE
11007
       VOM
             VOMER
11008
       NAS
             NASAL
11009
       SPH
             SPHENOID
11010
       ETH
             ETHMOID
11011
       LAC
             LACRIMAL
11012
       FRN
             FRONTAL
11013
       HCO
             HORNCORE
11014
       HSH
             HORN SHEATH
11015
             JUGAL = MALAR
       JUG
11016
             ZYGOMATIC ARCH
       ZYG
11017
             ORBITAL REGION
       ORB
11018
       TEM
             TEMPORAL
11019
       SQA
             SQUAMOSAL
11020
       PAR
             PARIETAL
11021
       OCC
             OCCIPITAL
       BOC
11022
             BASIOCCIPITAL
11023
      PCM
             OCCIPATAL CONDYLE
             MASTOID PROCESS OR REGION
11024
      MAS
11025
      PET
             PETROSAL
             BULLA=PETROUS TYMPANIC OR AUDITORY BULLA
11026
       BUL
11027
      PAS
             PARASHENOID
11028
      ALS
             ALISHENOID
11029
      DET
             DERMETHMOID
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(Source: Gifford and Crader, 1977: 225-238)

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11030
       LET
              LATERAL ETHMOID
11031
        PRT
              PARETHMOID
11032
        PFR
              FREFRONTAL
11033
        SPO
              SPHENOTIC
11034
       PRO
              PROOTIC
              PTEROTIC
11035
       PTO
11036
       EPO
              EPIOTIC
11037
       SOC
              SUPRAOCCIPITAL
11038
       XOC
              EXOCCIPITAL
11039
       COB
              CIRCUMORBITAL
11040
       HYQ
              UNIT HYM SYP MPT QUA
11041
       HYM
              HYOMANDIBULAR
11042
       SYP
              SYMPLECTIC
11043
       MPT
              METAPTERYGOID
11044
       QUA
              QUADRATE
11045
       PTG
              PTERYGOID
11046
       EPT
              ENTOPTERYGOID
11047
              SUPRAMAXILLA
       SMX
11048
       OPS
              UNIT OPR POP IOP SOP
11049
       OPR
              OPERCULUM
11050
       POP
              PRF:OPERCULUM
11051
       IOP
              INTERIPERCULUM
11052
              SUBOPERCULUM
       SUP
11053
       HYA
              UNIT BHY CHY EHY
11054
       BHY
              BASIHYAL
11055
       CHY
             CERATOHYAL
11056
       EHY
              EPIHYAL
11057
       UHY
             UROHYAL
11058
       BRN
             BRANCHIOSTEGAL
11059
       QJU
             QUADRATOJUGAL
11060
       LAC . .LACRIMAL
11061
       SOR
             SUPRAORBITAL
11062
       OTO
             OTOLITH
11063
             POST TEMPORAL UNIT PARIETAL SPHENOTIC FRONTAL
       PST
11064
       PSF
11065
             UNIT OCCIPITAL L. & R. PARIETAL
       OTP
11066
       PET
             PETROUS PORTION OF THE TEMPORAL BONE
11067
       MTP
             MASTOID PROCESS, BULLAE AND ZYGOMA
11068
       SOP
             SUPRAOCCIPITAL AND R. PARIETAL
11069
       PTP
             UNIT PTEROTIC AND PERIETAL
             UNIT CERATIHYAL AND EPIHYAL
11070
       CTE
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12000	MAN	MANDIBLE INDET OR COMPLETE
12001	MANT	MANDIBLE WITH TEETH
12002	SYM	SYMPHSIS
12003	SYMT	SYMPHYSIS WITH TEETH
12004	DEN	DENTARY OR CORPUS
12005	DENT	DENTARY WITH TEETH
12006	ANG	ANGLE OR ANGULAR
12007	SAN	SURANGULAR
12008	RAM	RAMUS
12009	CRN	CORONOID PROCESS
12010	ART	ARTICULAR CONDYLE OR ARTICULAR
12011	PRT	PREARTICULAR
12012	ALV	ALVEOLUS UPPER OR LOWER INDET

13000 13001	TTH ROT	TOOTH INDET ROOT INDET
	I DI	INCISOR INDET UPPER OR LOWER INDET DECIDUOUS INCISOR INDET UPPER OR LOWER INDET
	C DC	CANINE UPPER OR LOWER INDET DECIDUOUS CANINE UPPER OR LOWER INDET
13030	P	PREMOLAR INDET UPPER OR LOWER INDET
13040	DP	DECIDUOUS PREMOLAR INDET UPPER OR LOWER INDET
13043	DPM	DECIDUOUS THIRD PREMOLAR UPPER OR LOWER INDET

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13050 M
              MOLAR INDET UPPER OR LOWER INDET
 13051 MI
              FIRST MOLAR UPPER OR LOWER INDET
 13053 MT
              THIRD MOLAR UPPER OR LOWER INDET
 13060 CTH
              CHEEKTOOTH INDET UPPER ORLOWER INDET
 13070
        THR
              TOOTHROW UPPER OR LOWER INDET
 13071 DTHR DECIDUOUS TOOTHROW UPPER OR LOWER INDET
13110 UIO
             UPPER INCISOR INDET
13111 UII
              UPPER INCISOR 1
13112 UI2
              UPPER INCISOR 2
13113
       UI3
              UPPER INCISOR 3
13114
              UPPER INCISOR 4
       UI4
13115
       DUIO DECIDUOUS UPPER INCISOR INDET
13116 DUI1 DECIDUOUS UPPER INCISOR 1
13117 DUI2 DECIDUOUS UPPER INCISOR 2
13118 DUI3 DECIDUOUS UPPER INCISOR 3
13119
       DUI4 DECIDUOUS UPPER INCISOR 4
              UPPER CANINE
13120
       UC
13121 DUC
              DECIDUOUS UPPER CANINE
13130 UPO
             UPPER PREMOLAR INDET
13131
       UPl
             UPPER PREMOLAR 1
13132
      UP2
             UPPER PREMOLAR 2
13133 UP3
             UPPER PREMOLAR 3
13134
      UP4
             UPPER PREMOLAR 4
13135 UP34 UPPER PREMOLAR 3 OR 4
13140
       DUPO DECIDUOUS UPPER PREMOLAR INDET
       DUP1 DECIDUOUS UPPER PREMOLAR 1
DUP2 DECIDUOUS UPPER PREMOLAR 2
13141
13142
13142 DUP2 DECIDUOUS UPPER PREMOLAR 2
13143 DUP3 DECIDUOUS UPPER PREMOLAR 3
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13144 DUP4 DECIDOOUS RIPPER PREMOLAR 4

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13150 UMO
             UPPER MOLAR INDET
13151
       UMl
             UPPER MOLAR 1
             UPPER MOLAR 2
13152
       UM2
13153
       UM3
             UPPER MOLAR 3
13154
       UM12
             UPPER MOLAR 1 OR 2
      UM23 UPPER MOLAR 2 OR 3
13155
13160
       UCH
             UPPER CHEEKTOOTH INDET
13170
       UTHR UPPER TOOTHROW
13171
       DUTR DECIDUOUS UPPER TOOTHROW
13210 LIO
             LOWER INCISOR INDET
13211. . LI1
             LOWER INCISOR 1
13212 LI2
             LOWER INCISOR 2
13213
      LI3
             LOWER INCISOR 3
13214
             LOWER INCISOR 4
      LI4
             DECIDUOUS LOWER INCISOR INDET
DECIDUOUS LOWER INCISOR 1
13215
      DLIO
13216
      DLIL
13217. DLI2
             DECIDUOUS LOWER INCISOR 2
13218
      DLI3
             DECIDUOUS LOWER INDISOR 3
13219
      DLI4
            DECIDUOUS LOWER INCISOR 4
12220 LC
             LOWER CANINE
13221 DLC
             DECIDUOUS LOWER CANINE
13230
      LPO
             LOWER PREMOLAR INDET
      LPl
13231
             LOWER PREMOLAR 1
13232
      LP2
             LOWER PREMOLAR 2
13233
      LP3
             LOWER PREMOLAR 3
13234
      LP4
             LOWER PREMOLAR 4
13235 LP34 LOWER PREMOLAR 3 OR 4
             DECIDUOUS LOWER PREMOLAR INDET
13240
      DLPO
             DECIDUOUS LOWER PREMOLAR 1
13241
       DLPl
      DLP2
             DECIDUOUS LOWER PREMOLAR 2
13242
             DECIDUOUS LOWER PREMOLAR 3
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DECIDUOUS LOWER PREMOLAR 4

DLP3

13243

13244 DLP4

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13250
       LMO
              LOWER MOLAR INDET
       LMl
13251
              LOWER MOLAR 1
13252
       LM2
              LOWER MOLAR 2-
13253 LM3
              LOWER MOLAR 3
             LOWER MOLAR 1 OR 2
13254
       LM12
13255 LM23
             LOWER MOLAR 2 OR 3
13260 LCH
              LOWER CHEEKTOOTH INDET
13270
       LTHR LLOWER TOOTHROW
13271
      DLTR DECIDUOUS LOWER TOOTHROW
14000 HYO
             HYOID
20000 AXL
             AXIAL INDET
21000
       VRT
             VERTEBRA INDET
21001
       VRTR VERTEBRAL ROW ARTICULATER INDET OR MIXED
      CEN CENTRUM INDET
CENE CENTRUM EPIPHYSIS INDET
21002
21003
21100 CER
             CERVICAL VERTEBRA INDET
21101
      ATL
             ATLAS CERVICAL VERTEBRA 1
21102
       AXI
             AXIS CERVICAL VERTEBRA 2
21103
       CER3
             CERVICAL VERTEBRA 3
21104
       CER4
             CERVICAL VERTEBRA 4
21105
       CER5
             CERVICAL VERTEBRA 5
21106
       CER6
             CERVICAL VERTEBRA 6
21107
       CER7
             CERVICAL VERTEBRA 7
21108
            CERRVICAL ROW ARTICULATED
       CERR
21109
       CERC
             CERVICAL CENTRUM
21110
      CERE CERVICAL CENTRUM EPIPHYSIS
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21201
        THO1 THORACIC VERTEBRA 1
               THORACIC VERTEBRA 2
 21202
        THO2
 21203
        THO3
               THORACIC VERTEBRA 3
 21204
        THO4
               THORACIC VERTEBRA 4
               THORACIC VERTEBRA 5
THORACIC VERTEBRA 6
 21205
        THO5
        THO6
21206
21207
        THO7 THORACIC VERTEBRA 7
        THOS THORACIC VERTEBRA 8
21208
21209
        THO9 THORACIC VERTEBRA 9
21210
        THOIO THORACIC VERTEBRA 10
        THO11 THORACIC VERTEBRA 11
 21211
        THO12 THORACIC VERTEBRA 12
THO13 THORACIC VERTEBRA 13
THO14 THORACIC VERTEBRA 14
21212
21213
21214
21215
        THO15 THORACIC VERTEBRA 15
21216
        THO16 THORACIC VERTEBRA 16
21217 THO17 THORACIC VERTEBRA 17
21218 THO18 THORACIC VERTEBRA 18
21219 THOL LAST THORACIC VERTEBRA
        THOR THORACIC ROW ARTICULATED
21220
21221
               THORACIC CENTRUM
        THOC
21222
        THEC
             THORACIC CENTRUM EPIPHYSIS
               THORACIC VERTEBRAL SPINE
THORACIC TRANSVERSE PROCESS
21223
        TVS
21224
        TTP
21225 . TRK
               TRUNK VERTEBRA
21225
21300
       LUM
              LUMBAR VERTEBRA INDET
21301
        LUM1 LUMBAR VERTEBRA 1
21302
       LUM2
              LUMBAR VERTEBRA 2
21303
       LUM3 LUMBAR VERTEBRA 3
21304
       LUM4
             LUMBAR VERTEBRA 4
21305
       LUM5
             LUMBAR VERTEBRA 5
21306
       LUM6
              LUMBAR VERTEBRA 6
21307
       LUM7
              LUMBAR VERTEBRA 7
21308
       LUML LAST LUMBAR VERTEBRA
       LUMR LUMBAR ROW ARTICULATED
21309
21310
       LUMC
              LUMBAR CENTRUM
21311
       LUME
             LUMBAR CENTRUM EPIPHYSIS
21312
       LTP
              LUMBAR TRANSVERSE PREOCESS
21313
             LUMBAR VERTEBRA ANTERIOR
       LUMA
             LUMBAR VERTEBRA POSTERIOR
21314
       LUMP
21315
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THORACIC VERTEBRA INDET

21200

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SACRUM COMPLETE OR SACRAL VERTEBRA INDET
21400 SAC
21401
        SACI
              SACRAL VERTEBRA 1
21402
        SAC2
              SACRAL VERTEBRA 2
              SACRAL VERTEBRA 3
SACRAL VERTEBRA 4
21403
        SAC3
21404
        SAC4
              SACRAL VERTEBRA 5
21405
        SAC5
21406
        SACL
              LAST SACRAL VERTEBRA
21407
       SACC
              SACRAL CENTRUM
21408 SACE SACRAL CENTRUM EPIPHYSIS
21409 SACR SACRAL VERTEBRA 4 AND 5
              SACRAL CENTRUM EPIPHYSIS
21500 CAU
              CRUDAL VERTEBRA
21501
        CAUR
              CAUDAL ROW ARTICULATED
21502
       CAUE
              CAUDAL VERTEBRA EPIPHYSIS
21503
       WEB
              WEBERIAN APPARATUS
21504
       CAS
              CAUDAL VERTEBRA AND ONE SPINE
21505
       VEF
              VERTEBRAL FACET
21506
       CAUC
              CAUDAL VERTEBRAL CENT.'UM
21507
       SPI
              SPINE INDET
21508
       VER
              RIB FACET ON A VERTEBRA
21509 CVN
              CAUDAL VERTEBRA WITH EXPANDED NEURAL SPINE
22000: .RIB
              RIB INDET
22001 RIE
              RIB EPIPHYSIS
22100
       RIBA ANTERTIOR RIB
22101
       RIBl
             FIRST RIB
22200 RIBP POSTERIOR RIB
22201 STR "STERNAL RIB
22202 VTR VERTEBRAL RIB
22300
       COS
             COSTAL CARTILEGE
23000 STE
             STERNUM OR STERNABRAE
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24000	MNB	MANUBRIUM
25000	F.UR	FURCULUM
26000	BAC	BACULUM
30000	GIR	GIRDLE BONE INDET
31000	PEC	PECTORAL GIRDLE BONE INDET
31011	SCPG SCPA SCPS	ACROMION OF SCAPULA SPINE OF SCAPULA
31020	CLV	CLAVICLE
31030	COR	CORACOID
31040	ICL	INTERCLAVICAL
31050	ACR	ACROMION BONE
31060	CLE	CLEITHRUM
31070	SCL	SUPRACLEITHRUM
31080	PCL	POSTCLEITHRUM
31090	ACO	ANTERIOR CORACOID
32000	PEL	PELVIS INDET OR COMPLETE
32010	ILI	ILIUM
32020	ISC	ISCHIUM
32030	PUB	PUBIS
32040	ILIS	ILIUM PLUS ISCHIUM
32050	ILPB	ILUIM PLUS PUBIS

32060 ISBP ISCHIUM PLUS PUBIS

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32070 ACE
              ACETABULUM
 32071
       AILI ACETABULUM ILIUM ONLY
 32072
        AISC
              ACETABULUM ISCHIUM ONLY
 32073
        APUB
              ACETABULUM PUBIS ONLY
 32074
       AISI
              ACETABULUM ISCHIUM AND ILIUM ONLY
 32075
              ACETABULUM PUBIS AND ILIUM ONLY
        APIL
 32076
       APIS
              ACETABULUM PUBIS AND ISCHIUM ONLY
 32077
        APII
              ACETABULUM PUBIS ILIUM AND ISCHIUM
 32078
       IC
              ILIAC CREST
32080
       PPUB FREPUBIS
40000
       LBN
             LONGBONE INDET
41000
       FLB
             FORELIMB INDET OR ARTICULATED UNIT
41100
       HUM
              HUMERUS
41200
       RAD T RADIUS
41300
       ULN
             ULNA
41301
       ULC
             ULNA OLECRANON WITH SIGMOID NOTCH
41302
       ULS
             ULNA SIGMOID NOTCH ONLY
41402
       RUL
             RADIO ULNA
40500
       MET
             METAPODIAL INDET
41500
       MCO
             METACARPAL DIGIT INDET
41601
       MC1
             METACARPAL FIRST DIGIT
41502
             METALCARPAL SECOND DIGIT
       MC2
41503
       MC3
             METACARPAL THIRD DIGIT
41504
       MC4
             METACARPAL FOURTH DIGIT
41505
       MC5
             METACARPAL FIFTH DIGIT
41506
       MCM
             MAIN METACARPAL
41507
       MCA
             ACCESSORY METACARPAL
41508
             CARPOMETACARPUS
       CMC
42000
       HLB
             HINDLIMB INDET OR ARTICULATED UNIT
42100
       PEM
             FEMUR
42101
      FEE
             FEMUR EPIPHYSIS
42200
      TIB
             TIBIA
42201
      TIE
             TIBIA EPIPHYSIS
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42300 FIB
             FIBULA OR LATERAL MALLEOLUS
42400
       TBT
             TIBIOTARSUS
             METATARSAL DIGIT INDET
42500
       MTO
42501
       MTl
             METATARSAL FIRST DIGIT
42502
             METATARSAL SECOND DIGIT
       MT2
42503
             METATARSAL THIRD DIGIT
       MT3
42504
       MT4
             METATARSAL FOURTH DIGIT
             METATARSAL PIFTH DIGIT
42505
       MT5
42506
       MTM
             MAIN METATARSAL CANNON BONE
42507
       MTA
             ACCESSORY METATARSAL
42508
       TMT
              TARSOMETATARSUS
42600
       PAT
             PATELLA
50000
       POD
             PODIAL INDET
51000
       CAR
             CARPAL OR MANUS BONE INDET
51001
       SCA
             SCAPHOID
51002
       LUN
             LUNATE
51003
       CUN
             CUNEIFORM
51004
             MAGNUM
       MAG
51005
51006 PIS
             PISIFORM
51007
       TZD
             TRAPEZOID
51008 TZM
             TRAPEZIUM
51009
       SCL
             SCAPHOLUNAR
51010
       RDL
             RADIALE
51011
             INTERMEIUM CARPAL
       INTC
51012
       ULR
             ULNARE
51013
       CNCl
             CENTRALE CARPAL. 1
51014
             CENTRALE CARPAL 2
       CNC2
51015
       DCl
             DISTAL CARPAL 1
51016
       DC2
             DISTAL CARPAL 2
       DC3
             DESTAL CARPAL 3
51017
51018
       OC4
             DISTAL CARPAL 4
51019
       NAVI
             NAVICULAR OF THE CARPUS
51020
       TRI
             TRIQUETAL
51021
       CAP
             CAPITATE
51022
             HAMATE
       MAH
51023
       GMLT
             GREATER MULTANGLE
51024
       LMLT
             LESSER MULTANGLE
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50100
       PHA
             PHALANX INDET
50110
       PHAL
             FIRST PHALANX DIGIT INDET FRONT OR HIND INDET
50111
       PH11
             FIRST PHALANX FIRST DIGIT FRONT OR HIND INDET
50112
       PH12
             FIRST PHALANX SECOND DIGIT FRONT OR HIND INDET
50113
       PH13
             FIRST PHALANX THIRD DIGIT FRONT OR HIND INDET
50114
       PH14
             FIRST PHALANX FOURTH DIGIT FRONT OR HIND INDET
50115
       PH15
             FIRST PHALANX FIRTH FRONT OR HIND INDET
50120
       PHA2
             SECOND PHALANX DIGIT INDET
       PH21
50121
             SECOND PHALANX FIRST DIGIT FRONT OR HIND INDET
50122
       PH22
             SECOND PHALANX SECOND DIGIT FRONT OR HIND INDET
50123
       PH23
             SECOND PHALANX THIRD DIGIT FRONT OR HIND INDET
56124
       PH24
             SECOND PHALANX POURTH DIGIT FRONT OR HIND INDET
50125
       PH25
             SECOND PHALANX FIFTH DIGIT" FRONTLORIHIND INDET
50130
       PHA3
             THIRD PHALANX DIGIT INDET
50132
       PH32
             THIRD PHALANX SECOND DIGIT FRONT OR HIND INDET
50133
       PH33
             THIRD PHALANX THIRD DIGIT FRONT OR HIND INDET
50134
             THIRD PHALANX FOURTH DIGIT FRONT OR HIND INDET
       PH34
50135
             THIRD PHALANX FIFTH DIGIT FRONT OR HIND INDET
       PH35
50136
50140
       PHA4
            FOURTH PHALANX DIGIT INDET FRONT OR HIND INDET
50143
       PHA3
             FOURTH PHALANX THIRD DIGIT FRONT OR HIND INDET
50144
       PHA4
             FOURTH PHALANX FOURTH DIGIT FRONT OR HIND INDET
       PHAS FIFTH PHALANX FOURTH DIGIT FRONT OR HIND INDET
50154
51110
             FRONT FIRST PHALANX DIGIT INDET
       FP10
51111.
             FRONT FIRST PHALANX FIRST DIGIT
       FP11
51112
       FP12
             FRONT FIRST PHALANX SECOND DIGIT
             FRONT FIRST PHALANX THIRD DIGIT
51113
       FP13
51114
       FP14
             FRONT FIRST PHALANX FOURTH DIGIT
            FRONT FIRST PHALANX FIFTH DIGIT
51115
       FP15
51120
      FP20
             FRONT SECOND PHALANX DIGIT INDET
51121
       FP21
             FRONT SECOND PHALANX FIRST DIGIT
51122
             FRONT SECOND PHALANX SECOND DIGIT
       FP22
             FRONT SECOND PHALANX THIRD DIGIT
51123
      FP23
             FRONT SECOND PHALANX FOURTH DIGIT
51124
      FP24
51125 FP25 FRONT SECOND PHALANX FIFTH DIGIT
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51130 FP30 FRONT THIRD PHALANX DIGIT INDET
51132
       FP32
             FRONT THIRD PHALANX SECOND DIGIT
51133
       FP33
             FRONT THRID PHALANX THIRD DIGIT
             FRONT THIRD PHALANX POURTH DIGIT
51134
       FP34
       FP35
             FRONT THIRD PHALANX FIFTH DIGIT
51140
      FP40
             FRONT FOURTH PHALANX DIGIT INDET
51143
       FP43 FRONT FOURTH PHALANX THIRD DIGIT
51144
       FP44
             FRONT FOURTH PHALANX FOURTH DIGIT
51154
       FP54
             FRONT FIFTH PHALANX FOURTH DIGIT
52110
       HP10
             HIND FIRST PHALANX DIGIT INDET
       HP11
52111
             HIND FIRST PHALANX FIRST DIGIT
52112
       HP12
             HIND FIRST PHALANX SECOND DIGIT
52113
      HP13
             HIND FIRST PHALRNX THIRD DIGIT
52114
       HP14
             HIND FIRST PHALANX FOURTH DIGIT
52115
      HP15 HIND FIRST PHALANX FIFTH DIGIT
52120
             SECOND PHALANX DIGIT INDET
       HP20
52121
       HP21
             SECOND PHALANX FIRST DIGIT
52122
             SECOND PHALANX SECOND DIGIT
       HP22
52123
       HP23
             SECOND PHALANX THRID DIGIT
      HP24
52124
             SECOND PHALANX FOURTH DIGIT
52125
      HP25
             SECOND PHALANX FIFTH DIGIT
       HP30 HIND THIRD PHALANX DIGIT INDET
S2130
             HIND THIRD PHALANX SECOND DIGIT
52132
       HP32
52133
       HP33
             HIND THIRD PHALANX THIRD DIGIT
       HP34
52134
             HIND THIRD PHALANX FOURTH DIGIT
52135
       HP35
             HIND THIRD PHALANX PIFTH DIGIT
52140 HP40 HIND FOURTH PHALANX DIGIT INDET
      HP43
52143
             HIND FOURTH PHALANX THIRD DIGIT
52144
      HP44
             HIND FOURTH PHALANX FOURTH DIGIT
52145
      HP45
             HIND FOURTH PHALANX FIFTH DIGIT
             FIND FIFTH PHALANX DIGIT INDET
52150
      HP50
52151
      HP51
             HIND FIFTH PHALANX FIRST DIGIT
52152
      HP52
             HIND FIFTH PHALANX SECOND DIGIT
      HP53
52153
             HIND FIFTH PHALANX THIRD DIGIT
52154
      HP54
             HIND FIFTH PHALANX FOURTH DIGIT
52155
      PEP
             PROXIMAL EPIPHYSIS OF PHALANX INDET
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52000 TAR
             TARSAL OR PES BONE INDET
52001 AST
             ASTRAGALUS
52001 CAL CALGANEUM
52003 NAV
             NAVICULAR OF THE TARSUS
 52004
       CUB
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04	PO	POSTERLOR SEGMENT OF PORTION
05	AL	ANTEROLATERAL SEGMENT OF PORTION
06	PL	POSTEROLATERAL SEGMENT OF PORTION
07	MA	ANTEROMEDIAL SEGMENT OF PORTION
08	PO	POSTEROMEDIAL SEGMENT OF PORTION
09	HF	HALF SEGMENT LATERAL MEDIAL ANTERIOR POSTERIOR INDET
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12	DT	DISTAL SEGMENT
13	PX	PROXIMAL SEGMENT

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Appendix D FAUNAL ELEMENT IDENTIFICATIONS

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